



Search all conversati

Compose

Mail

Inbox

36

Starred

Chat



Spaces



Meet

[IJASEIT] Submission Acknowledgement

External Inbox x



IJASEIT ijaseit@gmail.com [via](#) insightsociet... Mon, Jan 17, 2:58 PM
to me

tra triyatni martosenjoyo:

Thank you for submitting the manuscript, "Public Toilets Design Thin the Architecture Design Process" to International Journal on Advanced Science, Engineering and Information Technology. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

Manuscript URL:

<http://insightsociety.org/ojaseit/index.php/ijaseit/author/submission/1>

Username: triyatni



Search all conversati

Compose

Mail

Inbox 36

Starred

Chat



Spaces



Meet

Dear,

no file paper in your submission

Editor

International Journal on Advanced Science, Engineering and Informa
Technology

<http://insightsociety.org/ijaseit/index.php/ijaseit>

Reply

Forward



Search all conversati

Compose

Mail

Inbox

36

Starred

Chat



Spaces



Meet

[IJASEIT] Submission Acknowledgement

External Inbox x



IJASEIT ijaseit@gmail.com [via](#) insightsoci... Mon, Jan 10, 11:28 AM
to me

tra triyatni martosenjoyo:

Thank you for submitting the manuscript, "Public Toilets Design Thin the Architecture Design Process" to International Journal on Advance Science, Engineering and Information Technology. With the online jo management system that we are using, you will be able to track its p through the editorial process by logging in to the journal web site:

Manuscript URL:

<http://insightsociety.org/ojaseit/index.php/ijaseit/author/submission/1>

Username: triyatni



Search all conversati

Compose

Mail

Inbox

36

Starred

Chat



Spaces



Meet

Dear,

no file paper in your submission

Editor

International Journal on Advanced Science, Engineering and Informa
Technology

<http://insightsociety.org/ijaseit/index.php/ijaseit>

Reply

Forward



Search all conversati

Compose

Mail

Sent

Drafts

5

Chat



Spaces



Meet

IJASEIT template which can be downloaded on the website. The following comments should be revised accordingly :

1. The number of words in the abstract should be a minimum of 220 a maximum of 250 words.
2. The Manuscript consist of 4 chapter : INTRODUCTION, MATERIAL RESULT AND DISCUSSION, CONCLUSION. Please refer to the template
3. The manuscript seems doesn't present well, please correct the layout Template IJASEIT 2021), make them display nicely, balance them in columns. Make sure the manuscript displays fix in every page. Suggest save as in DOCX for compatible in any office.
4. References should use at least 30 references, with 80% from the latest publication (2019-2022) from journal/proceeding indexing by Scopus
5. Citation and Reference in Paper must using Mendeley with IEEE style



Search all conversati

Compose

Mail

Inbox

36

Starred

Chat



Spaces



Meet

Journal on Advanced Science, Engineering and Information Technol
Toilets Design Thinking in the Architecture Design Process".

Our decision is to: Revision Required

Please update your abstract into 220-250 words and starting 2022, tl
references should use at least 30 references, with 80% from the late
publication (2019-2022) from journal/proceeding indexing by Scopus
and Reference in Paper must using Mendeley with IEEE Style.

Please submit your revision (Template IJASEIT 2021) in 10 days. Mc
days of paper will be rejected from the system. Re-upload your revis
journal system NOT via email.

Editor

Reviewer A:

Dear Author,



Search all conversati

Compose

Mail

Inbox

37

Starred

Chat



Spaces



Meet

Public Toilets Design Thinking in the Architecture Design Process

External Inbox



tra triyatni martosenjoy...

Thu, Apr 14, 11:33 AM (8 days ago)

to Rahmat, me

Dear Editor,

Thank you so much for the valuable comments and suggestion. We : the comments throughout the manuscript in a track change mode as suggested with the name file : revised manuscript.docx .

in Addition, file comments to reviewers A, C, D showing the response reviewer comment

Best regard

Triyatni



Search all conversati

Compose

Mail

Inbox

36

Starred

Chat



Spaces



Meet

[IJASEIT] Revision Required External Inbox x



Rahmat Hidayat <rahmat@in... Mon, Apr 18, 11:31 PM (4 days ago)
to me

tra triyatni martosenjoyo:

We have reached a decision regarding your submission to Internatio
Journal on Advanced Science, Engineering and Information Technol
Toilets Design Thinking in the Architecture Design Process".

Our decision is to: Revision Required

Please update your abstract into 220-250 words and starting 2022, tl
references should use at least 30 references, with 80% from the late
publication (2019-2022) from journal/proceeding indexing by Scopus
and Reference in Paper must using Mendeley with IEEE Style.



Search all conversati

Compose

report spam

Looks sate

Mail

Inbox

36

Starred

Chat



Spaces



Meet

Dear Editor,

Thank you so much for the valuable comments and suggestion. We : the comments throughout the manuscript in a track change mode as suggested with the name file : revised manuscript ver 2.docx .

in Addition, file comments to reviewer C showing the response of rev C comment

Best regard

Triyatni

International Journal on Advanced Science, Engineering and Informa Technology



Search all conversati

Compose

Mail

INBOX

35

Starred

Chat



Spaces



Meet

----- Forwarded message -----

From: **Rahmat Hidayat** <mr.rahmat@gmail.com>

Date: Fri, Apr 22, 2022 at 2:56 PM

Subject: JOURNAL PROCESSING FEE - 17098

To: tra triyatni martosenjoyo <triyatni@unhas.ac.id>

RE: JOURNAL PROCESSING FEE

We are happy to inform you that since Volume 5 (2015) *Journal on Advanced Science, Engineering, Infor. Technology* (IJASEIT) has been indexed in **Scopus**. T committees of IJASEIT agree that your manuscript is **ac** published in IJASEIT.

Title	Public Toilets Design Thinking in the Architectu Process
Authors	

Send

International Journal on Advanced Science, Engineering and Information Technology



HOME ABOUT USER HOME SEARCH CURRENT ARCHIVES
ANNOUNCEMENTS

Home > User > Author > Submissions > #17098 > **Summary**

#17098 Summary

SUMMARY REVIEW EDITING

Submission

Authors	Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif	
Title	Public Toilets Design Thinking in the Architecture Design Process	
Original file	17098-38535-1-SM.DOCX 2022-01-17	
Supp. files	None	ADD A SUPPLEMENTARY FILE
Submitter	tra triyatni martosenjoyo 	
Date submitted	January 17, 2022 - 01:58 PM	
Section	Articles	
Editor	Rahmat Hidayat 	

Status

Status	In Review
Initiated	2022-04-21
Last modified	2022-04-21

Submission Metadata

[EDIT METADATA](#)

Authors

Name	Triyatni Martosenjoyo 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia
Bio Statement	—
Principal contact for	editorial correspondence.
Name	Rahmi Amin Ishak 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia
Bio Statement	—
Name	Syarif Beddu 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia
Bio Statement	—
Name	Syavir Latif 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia

Bio Statement —

Title and Abstract

Title Public Toilets Design Thinking in the Architecture Design Process

Abstract Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The results show that the architect's design process generally still uses the Design Methods approach, despite the fact that architects do not actually carry out the design phases as theorized by Design Methods.

Indexing

Indexing

Keywords Public toilets, Design Methods; Participatory Design; architecture

Language en

Supporting Agencies

Agencies —

References

- References**
- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: McGraw-Hill Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.
- [11] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.
- [12] A. A. Bin Ruslan et al., "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411
- [13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.
- [14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.

- [15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.
- [16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.
- [17] J. C. Snyder, A. J. Catanese, and T. MacGintry, *Introduction to architecture*. McGraw-Hill, 1979.
- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say*. In *Routledge International Handbook of Participatory Design* (J. Simonsen, & T. Robertson, Trans). New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [39] K. E. Howell, *An Introduction to the Philosophy of Methodology* SAGE

Publication London. Los Angeles: Sage Publications, 2013.

[40] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog.* EG Guba. London: Sage Publications, Inc, 1990.

[41] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.

[42] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.

[43] T. Robertson and J. Simonsen, "Participatory Design: an introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.

[44] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.

[45] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.

[46] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.

[47] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the *Vibrio Cholerae* Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.

[48] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity.* Peabody: Hendrickson Publisher Inc, 1996.

[49] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gend. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.

[50] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.

[51] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.

[52] A. H. Maslow, *A theory of human motivation.* New Delhi: General Press, 2019.

[53] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities.* Singapore: Springer Nature Singapore Pte.Ltd, 2021.

[54] K. Marx, *Das Kapital Volume I.* Moscow: Progress Publishers, 1974.

[55] G. W. F. Hegel, *Hegel: Elements of the philosophy of right, Revised.* Cambridge: Cambridge University Press, 2017.

[56] R. Scruton, *The aesthetics of architecture.* Princeton: Princeton University Press, 2013.

[57] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real.* Routledge, 2016.

[58] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification.* Cambridge: Harvard University Press, 1951.

[59] M. D. Hills, "Kluckhohn and Strodbeck's values orientation theory," *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.

[60] J. Robbins and J. Sommerschuh, "Values | Cambridge Encyclopedia of Anthropology," 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).

[61] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.

[62] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR," FajarNews, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).

[63] T. Robertson and I. Wagner, "Ethics: Engagement, representation and politics-in-action," in Routledge international handbook of participatory design, Routledge, 2012, pp. 84–105.

[64] C. DiSalvo, A. Clement, and V. Pipek, "Communities: Participatory Design for, with and by communities," in Routledge international handbook of participatory design, Routledge, 2012, pp. 202–230.

Published by INSIGHT - Indonesian Society for Knowledge and Human Development

International Journal on Advanced Science, Engineering and Information Technology



HOME ABOUT USER HOME SEARCH CURRENT ARCHIVES
ANNOUNCEMENTS

Home > User > Author > Submissions > #17098 > **Summary**

#17098 Summary

SUMMARY REVIEW EDITING

Submission

Authors	Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif	
Title	Public Toilets Design Thinking in the Architecture Design Process	
Original file	17098-38535-1-SM.DOCX 2022-01-17	
Supp. files	None	ADD A SUPPLEMENTARY FILE
Submitter	tra triyatni martosenjoyo 	
Date submitted	January 17, 2022 - 01:58 PM	
Section	Articles	
Editor	Rahmat Hidayat 	

Status

Status	In Review
Initiated	2022-04-21
Last modified	2022-04-21

Submission Metadata

[EDIT METADATA](#)

Authors

Name	Triyatni Martosenjoyo 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia
Bio Statement	—
Principal contact for	editorial correspondence.
Name	Rahmi Amin Ishak 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia
Bio Statement	—
Name	Syarif Beddu 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia
Bio Statement	—
Name	Syavir Latif 
Affiliation	Department of Architecture, Faculty of Engineering, Hasanuddin University, Indonesia
Country	Indonesia

Bio Statement —

Title and Abstract

Title Public Toilets Design Thinking in the Architecture Design Process

Abstract Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The results show that the architect's design process generally still uses the Design Methods approach, despite the fact that architects do not actually carry out the design phases as theorized by Design Methods.

Indexing

Indexing

Keywords Public toilets, Design Methods; Participatory Design; architecture

Language en

Supporting Agencies

Agencies —

References

- References**
- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: Mcgraw-Heal Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.
- [11] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.
- [12] A. A. Bin Ruslan et al., "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411
- [13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.
- [14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.

- [15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.
- [16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.
- [17] J. C. Snyder, A. J. Catanese, and T. MacGintry, *Introduction to architecture*. McGraw-Hill, 1979.
- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say*. In *Routledge International Handbook of Participatory Design* (J. Simonsen, & T. Robertson, Trans). New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [39] K. E. Howell, *An Introduction to the Philosophy of Methodology* SAGE

Publication London. Los Angeles: Sage Publications, 2013.

[40] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog.* EG Guba. London: Sage Publications, Inc, 1990.

[41] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.

[42] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.

[43] T. Robertson and J. Simonsen, "Participatory Design: an introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.

[44] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.

[45] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.

[46] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.

[47] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the *Vibrio Cholerae* Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.

[48] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity.* Peabody: Hendrickson Publisher Inc, 1996.

[49] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gend. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.

[50] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.

[51] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.

[52] A. H. Maslow, *A theory of human motivation.* New Delhi: General Press, 2019.

[53] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities.* Singapore: Springer Nature Singapore Pte.Ltd, 2021.

[54] K. Marx, *Das Kapital Volume I.* Moscow: Progress Publishers, 1974.

[55] G. W. F. Hegel, *Hegel: Elements of the philosophy of right, Revised.* Cambridge: Cambridge University Press, 2017.

[56] R. Scruton, *The aesthetics of architecture.* Princeton: Princeton University Press, 2013.

[57] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real.* Routledge, 2016.

[58] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification.* Cambridge: Harvard University Press, 1951.

[59] M. D. Hills, "Kluckhohn and Strodbeck's values orientation theory," *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.

[60] J. Robbins and J. Sommerschuh, "Values | Cambridge Encyclopedia of Anthropology," 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).

[61] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.

[62] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR," FajarNews, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).

[63] T. Robertson and I. Wagner, "Ethics: Engagement, representation and politics-in-action," in Routledge international handbook of participatory design, Routledge, 2012, pp. 84–105.

[64] C. DiSalvo, A. Clement, and V. Pipek, "Communities: Participatory Design for, with and by communities," in Routledge international handbook of participatory design, Routledge, 2012, pp. 202–230.

Published by INSIGHT - Indonesian Society for Knowledge and Human Development

Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design.

In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The results show that the architect's design process generally still uses the Design Methods approach, despite the fact that architects do not actually carry out the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021. IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have very complex requirements in order to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a

public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design guide books that are generally intended for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12] This method

was followed by Ching, Snyder, White, Khan, and other famous archit[13]–[17].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [18]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of different groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [19], [20].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [21]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them. Therefore, to produce a quality design, their involvement is needed [22]–[24].

In reality, professional architects tend to still use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021)[25], Bratteteig & Wagner (2014) [26] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [27], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [28]–[30].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already carried out collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the

Bauhaus workshop they combine different design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [31].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [32], [33]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [34].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been changed. Research time 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia.

TABLE I
RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Number	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [35].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often confusing because it is difficult to determine which process can perform better than the other [36]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [22]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [37].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, he decided to cut the corners of the building's triangle. See Figure 1.

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs. See Figure 2.

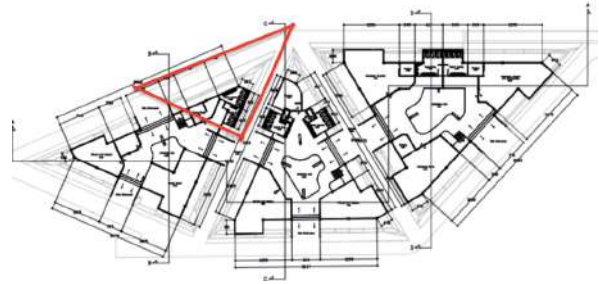


Fig. 1. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Source: Department of Architecture, Hasanuddin University

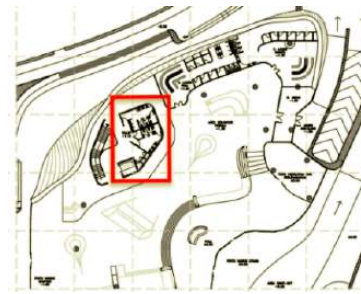


Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Source: Department of Architecture, Hasanuddin University

Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is carried out with feedback to the previous stages. They are created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely carried out by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It doesn't matter if the toilet is shared with the owner of the house. Yayang and the residents made the layout of the area and the typical cottage according to the

dimensions of the houses that the residents wanted. See Figure 3.

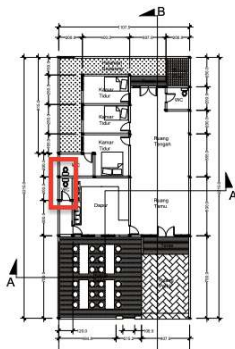


Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.
Source: Department of Architecture, Hasanuddin University

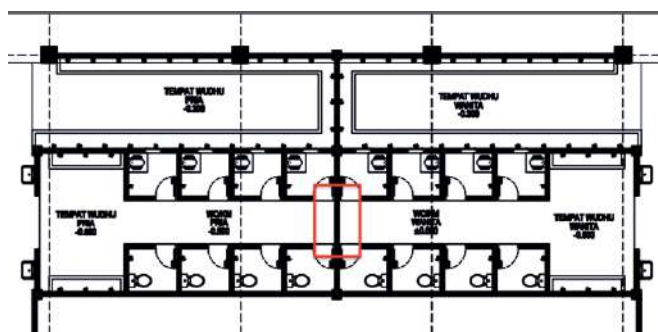


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.
Source: Pillar Bangunindo

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

On Friday the mosque is only visited by men [38]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. See Figure 4.

Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating. During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where

the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a good quality toilet.

Dedi's idea above turned out to be impossible when he was in charge of designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to carry out his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for a good restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [39], [40]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [41]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process carried out by the architects above is very different from what Yayang did. Project Yayang relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [42]. Citizens are involved since problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants,

but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [43], [44]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [45].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a relatively large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function, but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [46].

The toilet room has the most expensive price 2-3 times compared to the unit price per m² compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include facilities for ablution for Muslims who are the largest community in Indonesia. Usually by reason of needing clean and dirty water networks [47], the ablution place is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablution faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablution room is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablution room is a place to clean the body from najis. Wudhu is a process of cleansing the body of Muslims. Therefore, toileting and ablution activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [48].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan

considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [49]–[51].

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [52], [53]. When planned, Dedi's client wanted to present her toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project. Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [54] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [55]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [56]. For Deleuze [57], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of action [58]. Value orientation is always unique and contextual and is owned by each community [59][60]. Ari's public toilet appears to distinguish it from what is perceived as un-Islamic.

Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects tell about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [32].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [61]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [62]. Consequently, all teaching and learning processes, including the final project studio, must also be carried out using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is

judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a relatively long time and relatively large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [63]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education and Participatory Design. Design Methods is carried out with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [31]. The important point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them [63]. In contrast to Design Methods where the roles of the designer and user are defined from the start in the analysis phase. in Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [64].

The approach that architects choose in the process of designing their projects generally uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who handle non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process, it is discussed when it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget is limited. However, for non-government projects / community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though the availability of a limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: Mcgraw-Heal Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.
- [11] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.
- [12] A. A. Bin Ruslan *et al.*, "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.
- [14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.
- [15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.
- [16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.
- [17] J. C. Snyder, A. J. Catanese, and T. MacGinty, *Introduction to architecture*. McGraw-Hill, 1979.
- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.

- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say. In Routledge International Handbook of Participatory Design (J. Simonsen, & T. Robertson, Trans)*. New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [39] K. E. Howell, *An Introduction to the Philosophy of Methodology SAGE Publication London*. Los Angeles: Sage Publications, 2013.
- [40] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog. EG Guba*. London: Sage Publications, Inc, 1990.
- [41] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.
- [42] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.
- [43] T. Robertson and J. Simonsen, "Participatory Design: an introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.
- [44] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.
- [45] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [46] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.
- [47] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [48] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [49] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gend. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [50] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [51] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [52] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [53] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [54] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [55] G. W. F. Hegel, *Hegel: Elements of the philosophy of right*, Revised. Cambridge: Cambridge University Press, 2017.
- [56] R. Scruton, *The aesthetics of architecture*. Princeton: Princeton University Press, 2013.
- [57] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real*. Routledge, 2016.
- [58] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification*. Cambridge: Harvard University Press, 1951.
- [59] M. D. Hills, "Kluckhohn and Strodbeck's values orientation theory," *Online readings Psychol. Cult.*, vol.

- 4, no. 4, pp. 919–2307, 2002.
- [60] J. Robbins and J. Sommerschuh, “Values | Cambridge Encyclopedia of Anthropology,” 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).
- [61] Kementerian Keuangan RI, “Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI.” [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [62] Fajar, “Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR,” *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyediaan-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [63] T. Robertson and I. Wagner, “Ethics: Engagement, representation and politics-in-action,” in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 84–105.
- [64] C. DiSalvo, A. Clement, and V. Pipek, “Communities: Participatory Design for, with and by communities,” in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 202–230.

Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The results show that the architect's design process generally still uses the Design Methods approach, despite the fact that architects do not actually carry out the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021. IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have very complex requirements in order to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find

a public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design guide books that are generally intended for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method

was followed by Ching, Snyder, White, Khan, and other famous archit [13]–[16].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [17]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of different groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [18], [19].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [20]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them. Therefore, to produce a quality design, their involvement is needed [21], [22].

In reality, professional architects tend to still use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [23], Harington, et.al (2019) [24] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [25], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [26]–[28].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already carried out collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to

produce progressive social and cultural change. At the Bauhaus workshop they combine different design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [29].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [30], [31]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [32].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been changed. Research time 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia.

TABLE I
RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Number	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [33].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often

confusing because it is difficult to determine which process can perform better than the other [34]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [21]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [35].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, He decided to cut the corners of the building's triangle. See Fig. 1.

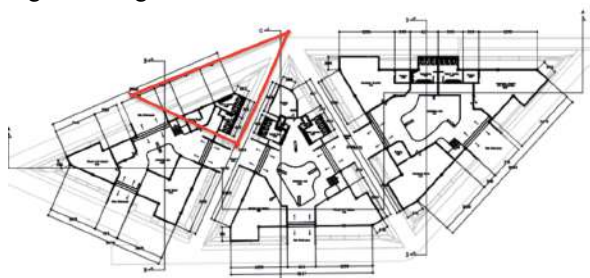


Fig. 1. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan. Source: Department of Architecture, Hasanuddin University

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora is consistent with his choice of building form. The

entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs. See Fig. 2.

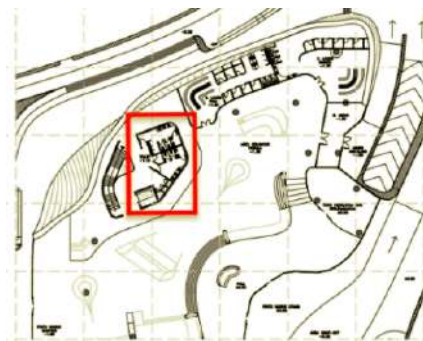


Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan. Source: Department of Architecture, Hasanuddin University

Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is carried out with feedback to the previous stages. They are created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely carried out by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It doesn't matter if the toilet is shared with the owner of the house. Yayang and the residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. See Fig. 3.

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic

principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

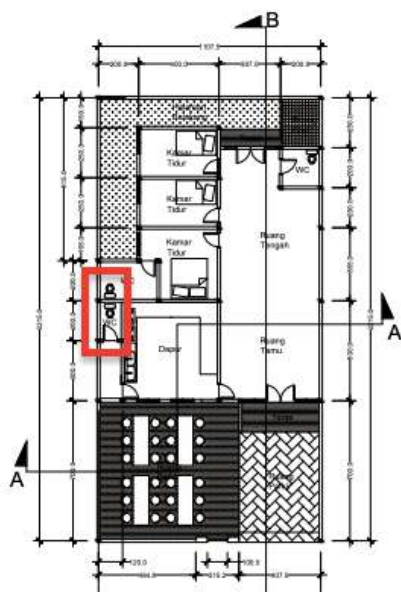


Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.

Source: Department of Architecture, Hasanuddin University

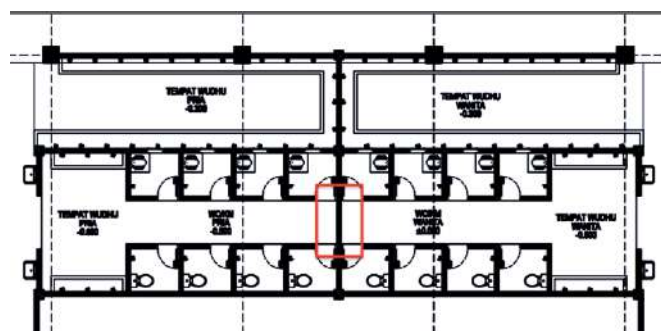


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.

Source: Pillar Bangunindo

On Friday the mosque is only visited by men [36]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. See Fig. 4.

Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating. During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a good quality toilet.

Dedi's idea above turned out to be impossible when he was in charge of designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to carry out his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for a good restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [37]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [38]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process carried out by the architects above is very different from what Yayang did. Project Yayang relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [39]. Citizens are involved since

problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [40]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [41], [42].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a relatively large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function, but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [43].

The toilet room has the most expensive price 2-3 times compared to the unit price per m² compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include facilities for ablution for Muslims who are the largest community in Indonesia. Usually by reason of needing clean and dirty water networks [44], the ablution place is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablution faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablution room is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablution room is a place to clean the body from najis. Wudhu is a process of cleansing the body of Muslims. Therefore, toileting and ablution activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [45].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was

not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [46]–[48]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [49], [50]. When planned, Dedi's client wanted to present her toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project. Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [51] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [52]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [53]. For Deleuze [54], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of

action [55]. Value orientation is always unique and contextual and is owned by each community [56]. Ari's public toilet appears to distinguish it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects tell about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [57].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [58]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [59]. Consequently, all teaching and learning processes, including the final project studio, must also be carried out using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system

from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in

formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a relatively long time and relatively large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [60]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education and Participatory Design. Design Methods is carried out with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [61]. The important point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them. In contrast to Design Methods where the roles of the designer and user are defined from the start in the analysis phase [60]. in Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [62].

The approach that architects choose in the process of designing their projects generally uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who handle non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process, it is discussed when it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget is limited. However, for non-government projects / community

organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though the availability of a limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] J. Boge, S. Callewaert, and K. A. Petersen, "The Impact of Bathroom Design on Privacy for Users with Special Needs," *Ageing Int.*, vol. 44, no. 3, pp. 300–317, 2019.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: McGraw-Hill Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science Ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] Q. Liu, "Application of Architectural Programming in Architectural Design," in *2019 5th International Conference on Humanities and Social Science Research (ICHSSR 2019)*, 2019, pp. 100–103.
- [11] X. Wang and H. Hua, "Construction and Renovation of Green Buildings in Villages and Towns," in *Green Village and Town Construction in China*, Springer, 2021, pp. 187–223.
- [12] A. A. Bin Ruslan *et al.*, "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] T. A. de Lemos Martins, S. Faraut, and L. Adolphe, "Influence of context-sensitive urban and architectural design factors on the energy demand of buildings in Toulouse, France," *Energy Build.*, vol. 190, pp. 262–278, 2019.
- [14] K. Al-Kodmany, "The Chicago Loop," in *Tall Buildings and the City*, Springer, 2020, pp. 293–368.
- [15] C. L. Marcos and J. Balmer, "Graphic Imprints, Grids and Diagrams in Architecture," in *Congreso Internacional de Expresión Gráfica Arquitectónica*, 2020, pp. 403–417.
- [16] G. E. Meyers, "I Introduction the experience of monumentality in etruscan and early roman architecture," in *Monumentality in Etruscan and Early Roman Architecture*, University of Texas Press, 2021, pp. 1–20.
- [17] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [18] A. Khakee, "Planning dilemmas," *Plan. Theory Pract.*, vol. 21, no. 1, pp. 175–181, 2020.
- [19] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [20] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [21] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [22] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [23] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [24] C. Harrington, S. Erete, and A. M. Piper, "Deconstructing community-based collaborative design: Towards more equitable participatory design engagements," *Proc. ACM Human-Computer*

- Interact.*, vol. 3, no. CSCW, pp. 1–25, 2019.
- [25] S. Bodker, C. Dindler, O. S. Iversen, and R. C. Smith, “Participatory Design,” *Synth. Lect. Human-Centered Informatics*, vol. 14, no. 5, pp. i–143, 2021.
- [26] A. Sealy, “How Japan’s Music-playing, Water-spraying TOTO Toilets Took Over the World,” *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [27] The Conversation, “Toilets of the future must be designed with people in mind, not technology,” 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [28] W.-Z. Cai, N.-S. Chou, M.-F. Tsai, and Y.-C. Lin, “Intelligent Toilet Management System with Internet of Things Technology,” in *2019 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW)*, 2019, pp. 1–2.
- [29] O. Kondratyeva, “Gesamtkunstwerk as a formula for creating artistic character in architecture by Volodymyr Pokrovsky,” *Archit. Stud. 1 (5)*, 2019, no. 1, pp. 27–34, 2019.
- [30] D. P. Doordan, “Introduction. Writing History: Reflections on the Story of Midcentury Modern Architecture,” in *Sanctioning Modernism*, University of Texas Press, 2021, pp. 1–6.
- [31] R. Aburamadan and C. Trillo, “Applying design science approach to architectural design development,” *Front. Archit. Res.*, vol. 9, no. 1, pp. 216–235, 2020.
- [32] T. Mostowlansky and A. Rota, “Emic and etic,” *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [33] A. Lareau, *Listening to People: A Practical Guide to Interviewing, Participant Observation, Data Analysis, and Writing It All Up*. University of Chicago Press, 2021.
- [34] U. Kozminska, “Circular design: reused materials and the future reuse of building elements in architecture. Process, challenges and case studies,” in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 225, no. 1, p. 12033.
- [35] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [36] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [37] O. Bukve, *Designing social science research*. Springer, 2019.
- [38] C. Salazar Ferro, I. Artega Arredondo, C. M. Rodriguez, and D. H. Nadal, “Active learning in architectural education: A participatory design experience (PDE) in Colombia,” *Int. J. Art Des. Educ.*, vol. 39, no. 2, pp. 346–366, 2020.
- [39] B. Dixon, L. S. McHattie, and C. Broadley, “The imagination and public participation: a Deweyan perspective on the potential of design innovation and participatory design in policy-making,” *CoDesign*, pp. 1–13, 2021.
- [40] M. Cozza, A. Cusinato, and A. Philippopoulos-Mihalopoulos, “Atmosphere in participatory design,” *Sci. Cult. (Lond.)*, vol. 29, no. 2, pp. 269–292, 2020.
- [41] C. W. Totten, *Architectural Approach to Level Design*. CRC Press, 2019.
- [42] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, “Getting participatory design done: From methods and choices to translation work across constituent domains,” *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [43] M. Byrne and M. Norris, “Housing market financialization, neoliberalism and everyday retrenchment of social housing,” *Environ. Plan. A Econ. Sp.*, p. 0308518X19832614, 2019.
- [44] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, “Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria,” *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [45] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [46] Y. M. Reddy, S. Raghavan, and S. C. Vedala, “A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal,” *Indian J. Gend. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [47] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, “Women’s perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study,” *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [48] E. Ellisa and L. Luana, “Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women’s perception of safety,” *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [49] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [50] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [51] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [52] A. Blunden, “The Three Parts of The Philosophy of Right: Right, Morality and Ethical Life,” in *Hegel for Social Movements*, Brill, 2019, pp. 180–191.
- [53] R. Scruton, *The aesthetics of architecture*. Princeton University Press, 2021.
- [54] L. Holm, *Brunelleschi, Lacan, Le Corbusier: Architecture, space and the construction of subjectivity*. Routledge, 2020.
- [55] A. Zapko-Willmes, S. H. Schwartz, J. Richter, and C. Kandler, “Basic value orientations and moral foundations: Convergent or discriminant constructs?,” *J. Res. Pers.*, vol. 92, p. 104099, 2021.
- [56] H. Wulff, “Writing anthropology,” *Cambridge Encycl. Anthropol.*, 2021.
- [57] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [58] Kementerian Keuangan RI, “Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI.” [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [59] Fajar, “Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR,” *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [60] D. Kinder, M. E. Reynolds, and N. Burns, *Categorical Politics in Action*. Routledge New Directions in Public Opinion, 2019.
- [61] L. J. Bannon and P. Ehn, “Design: design matters in Participatory Design,” in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [62] J. Hardy and S. Vargas, “Participatory design and the future of rural LGBTQ communities,” in *Companion Publication of the 2019 on Designing Interactive Systems Conference 2019 Companion*, 2019, pp. 195–199.

Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The results show that the architect's design process generally still uses the Design Methods approach, despite the fact that architects do not actually carry out the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021. IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have very complex requirements in order to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find

a public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design guide books that are generally intended for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method

was followed by Ching, Snyder, White, Khan, and other famous archit [13]–[16].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [17]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of different groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [18], [19].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [20]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them. Therefore, to produce a quality design, their involvement is needed [21], [22].

In reality, professional architects tend to still use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [23], Harington, et.al (2019) [24] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [25], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [26]–[28].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already carried out collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to

produce progressive social and cultural change. At the Bauhaus workshop they combine different design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [29].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [30], [31]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [32].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been changed. Research time 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia.

TABLE I
RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Number	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [33].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often

confusing because it is difficult to determine which process can perform better than the other [34]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [21]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [35].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, He decided to cut the corners of the building's triangle. See Fig. 1.

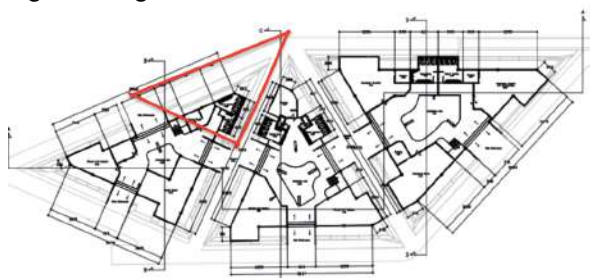


Fig. 1. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan. Source: Department of Architecture, Hasanuddin University

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora is consistent with his choice of building form. The

entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs. See Fig. 2.

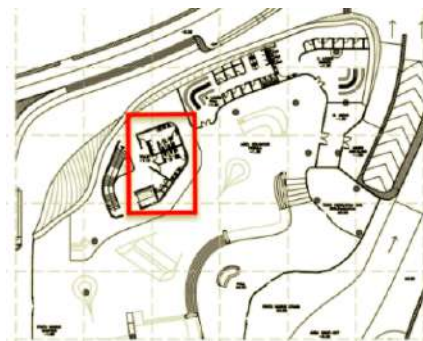


Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan. Source: Department of Architecture, Hasanuddin University

Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is carried out with feedback to the previous stages. They are created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely carried out by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It doesn't matter if the toilet is shared with the owner of the house. Yayang and the residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. See Fig. 3.

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic

principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

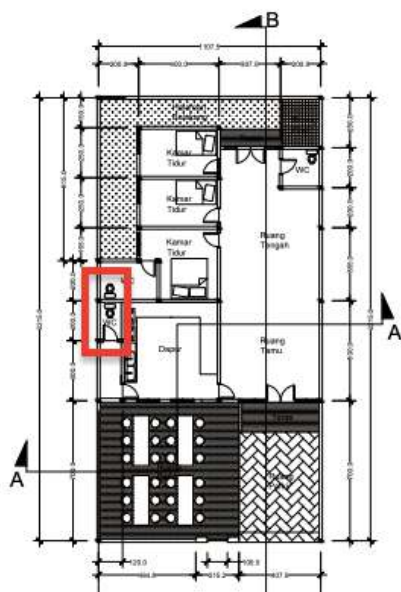


Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.

Source: Department of Architecture, Hasanuddin University

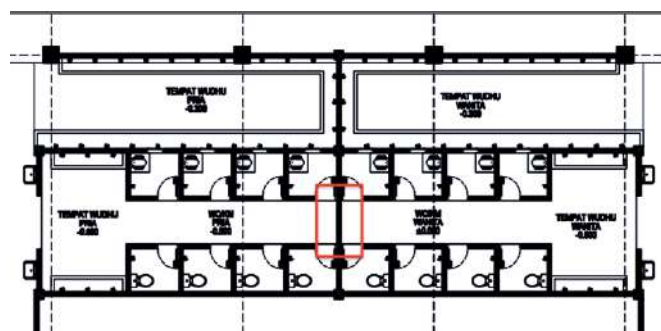


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.

Source: Pillar Bangunindo

On Friday the mosque is only visited by men [36]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. See Fig. 4.

Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating. During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a good quality toilet.

Dedi's idea above turned out to be impossible when he was in charge of designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to carry out his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for a good restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [37]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [38]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process carried out by the architects above is very different from what Yayang did. Project Yayang relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [39]. Citizens are involved since

problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [40]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [41], [42].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a relatively large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function, but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [43].

The toilet room has the most expensive price 2-3 times compared to the unit price per m² compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include facilities for ablution for Muslims who are the largest community in Indonesia. Usually by reason of needing clean and dirty water networks [44], the ablution place is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablution faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablution room is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablution room is a place to clean the body from najis. Wudhu is a process of cleansing the body of Muslims. Therefore, toileting and ablution activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [45].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was

not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [46]–[48]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [49], [50]. When planned, Dedi's client wanted to present her toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project. Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [51] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [52]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [53]. For Deleuze [54], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of

action [55]. Value orientation is always unique and contextual and is owned by each community [56]. Ari's public toilet appears to distinguish it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects tell about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [57].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [58]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [59]. Consequently, all teaching and learning processes, including the final project studio, must also be carried out using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system

from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in

formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a relatively long time and relatively large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [60]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education and Participatory Design. Design Methods is carried out with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [61]. The important point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them. In contrast to Design Methods where the roles of the designer and user are defined from the start in the analysis phase [60]. in Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [62].

The approach that architects choose in the process of designing their projects generally uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who handle non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process, it is discussed when it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget is limited. However, for non-government projects / community

organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though the availability of a limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] J. Boge, S. Callewaert, and K. A. Petersen, "The Impact of Bathroom Design on Privacy for Users with Special Needs," *Ageing Int.*, vol. 44, no. 3, pp. 300–317, 2019.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: McGraw-Hill Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science Ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] Q. Liu, "Application of Architectural Programming in Architectural Design," in *2019 5th International Conference on Humanities and Social Science Research (ICHSSR 2019)*, 2019, pp. 100–103.
- [11] X. Wang and H. Hua, "Construction and Renovation of Green Buildings in Villages and Towns," in *Green Village and Town Construction in China*, Springer, 2021, pp. 187–223.
- [12] A. A. Bin Ruslan *et al.*, "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] T. A. de Lemos Martins, S. Faraut, and L. Adolphe, "Influence of context-sensitive urban and architectural design factors on the energy demand of buildings in Toulouse, France," *Energy Build.*, vol. 190, pp. 262–278, 2019.
- [14] K. Al-Kodmany, "The Chicago Loop," in *Tall Buildings and the City*, Springer, 2020, pp. 293–368.
- [15] C. L. Marcos and J. Balmer, "Graphic Imprints, Grids and Diagrams in Architecture," in *Congreso Internacional de Expresión Gráfica Arquitectónica*, 2020, pp. 403–417.
- [16] G. E. Meyers, "I Introduction the experience of monumentality in etruscan and early roman architecture," in *Monumentality in Etruscan and Early Roman Architecture*, University of Texas Press, 2021, pp. 1–20.
- [17] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [18] A. Khakee, "Planning dilemmas," *Plan. Theory Pract.*, vol. 21, no. 1, pp. 175–181, 2020.
- [19] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [20] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [21] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [22] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [23] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [24] C. Harrington, S. Erete, and A. M. Piper, "Deconstructing community-based collaborative design: Towards more equitable participatory design engagements," *Proc. ACM Human-Computer*

- Interact.*, vol. 3, no. CSCW, pp. 1–25, 2019.
- [25] S. Bodker, C. Dindler, O. S. Iversen, and R. C. Smith, “Participatory Design,” *Synth. Lect. Human-Centered Informatics*, vol. 14, no. 5, pp. i–143, 2021.
- [26] A. Sealy, “How Japan’s Music-playing, Water-spraying TOTO Toilets Took Over the World,” *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [27] The Conversation, “Toilets of the future must be designed with people in mind, not technology,” 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [28] W.-Z. Cai, N.-S. Chou, M.-F. Tsai, and Y.-C. Lin, “Intelligent Toilet Management System with Internet of Things Technology,” in *2019 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW)*, 2019, pp. 1–2.
- [29] O. Kondratyeva, “Gesamtkunstwerk as a formula for creating artistic character in architecture by Volodymyr Pokrovsky,” *Archit. Stud. 1 (5)*, 2019, no. 1, pp. 27–34, 2019.
- [30] D. P. Doordan, “Introduction. Writing History: Reflections on the Story of Midcentury Modern Architecture,” in *Sanctioning Modernism*, University of Texas Press, 2021, pp. 1–6.
- [31] R. Aburamadan and C. Trillo, “Applying design science approach to architectural design development,” *Front. Archit. Res.*, vol. 9, no. 1, pp. 216–235, 2020.
- [32] T. Mostowlansky and A. Rota, “Emic and etic,” *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [33] A. Lareau, *Listening to People: A Practical Guide to Interviewing, Participant Observation, Data Analysis, and Writing It All Up*. University of Chicago Press, 2021.
- [34] U. Kozminska, “Circular design: reused materials and the future reuse of building elements in architecture. Process, challenges and case studies,” in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 225, no. 1, p. 12033.
- [35] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [36] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [37] O. Bukve, *Designing social science research*. Springer, 2019.
- [38] C. Salazar Ferro, I. Artega Arredondo, C. M. Rodriguez, and D. H. Nadal, “Active learning in architectural education: A participatory design experience (PDE) in Colombia,” *Int. J. Art Des. Educ.*, vol. 39, no. 2, pp. 346–366, 2020.
- [39] B. Dixon, L. S. McHattie, and C. Broadley, “The imagination and public participation: a Deweyan perspective on the potential of design innovation and participatory design in policy-making,” *CoDesign*, pp. 1–13, 2021.
- [40] M. Cozza, A. Cusinato, and A. Philippopoulos-Mihalopoulos, “Atmosphere in participatory design,” *Sci. Cult. (Lond.)*, vol. 29, no. 2, pp. 269–292, 2020.
- [41] C. W. Totten, *Architectural Approach to Level Design*. CRC Press, 2019.
- [42] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, “Getting participatory design done: From methods and choices to translation work across constituent domains,” *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [43] M. Byrne and M. Norris, “Housing market financialization, neoliberalism and everyday retrenchment of social housing,” *Environ. Plan. A Econ. Sp.*, p. 0308518X19832614, 2019.
- [44] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, “Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria,” *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [45] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [46] Y. M. Reddy, S. Raghavan, and S. C. Vedala, “A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal,” *Indian J. Gend. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [47] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, “Women’s perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study,” *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [48] E. Ellisa and L. Luana, “Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women’s perception of safety,” *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [49] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [50] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [51] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [52] A. Blunden, “The Three Parts of The Philosophy of Right: Right, Morality and Ethical Life,” in *Hegel for Social Movements*, Brill, 2019, pp. 180–191.
- [53] R. Scruton, *The aesthetics of architecture*. Princeton University Press, 2021.
- [54] L. Holm, *Brunelleschi, Lacan, Le Corbusier: Architecture, space and the construction of subjectivity*. Routledge, 2020.
- [55] A. Zapko-Willmes, S. H. Schwartz, J. Richter, and C. Kandler, “Basic value orientations and moral foundations: Convergent or discriminant constructs?,” *J. Res. Pers.*, vol. 92, p. 104099, 2021.
- [56] H. Wulff, “Writing anthropology,” *Cambridge Encycl. Anthropol.*, 2021.
- [57] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [58] Kementerian Keuangan RI, “Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI.” [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [59] Fajar, “Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR,” *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [60] D. Kinder, M. E. Reynolds, and N. Burns, *Categorical Politics in Action*. Routledge New Directions in Public Opinion, 2019.
- [61] L. J. Bannon and P. Ehn, “Design: design matters in Participatory Design,” in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [62] J. Hardy and S. Vargas, “Participatory design and the future of rural LGBTQ communities,” in *Companion Publication of the 2019 on Designing Interactive Systems Conference 2019 Companion*, 2019, pp. 195–199.

Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design.

In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The results show that the architect's design process generally still uses the Design Methods approach, despite the fact that architects do not actually carry out the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021. IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have very complex requirements in order to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a

public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design guide books that are generally intended for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method

Formatted: Highlight

Commented [Joe1]: issue

Commented [Joe2]: INTRODUCTION is suggested to be revised. Too many theory and discussions on the methods. Should more discussions on the issue; toilet.

Formatted: Underline

Commented [Joe3]: WHAT would be the main aspects of the public toilets; esthetic? or quality systems?. Architects = esthetics?

Formatted: Highlight

Formatted: Highlight

was followed by Ching, Snyder, White, Khan, and other famous archit [13]–[16].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [17]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of different groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [18], [19].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [20]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them. Therefore, to produce a quality design, their involvement is needed [21], [22].

In reality, professional architects tend to still use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [23], Harington, et.al (2019) [24] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [25], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [26]–[28].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already carried out collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the

Bauhaus workshop they combine different design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [29].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [30], [31]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [32].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been changed. Research time 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia.

TABLE I
RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Number	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [33].

Commented [Joe4]: METHOD is not discussed. Please provide the DESIGN METHOD/PROCESS and PARTICIPATORY DESIGN PROCESS. WHAT are differences between this tow concepts.

Commented [Joe5]: Duration?. English grammar is important.

Formatted: Highlight

Commented [Joe6]: Respondents?. Choose the appropriate word

Formatted: Highlight

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often confusing because it is difficult to determine which process can perform better than the other [34]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [21]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [35].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, He decided to cut the corners of the building's triangle. See Fig. 1.

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs. See Fig. 2.



Fig. 1. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Source: Department of Architecture, Hasanuddin University



Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Source: Department of Architecture, Hasanuddin University

Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is carried out with feedback to the previous stages. They are created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely carried out by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It doesn't matter if the toilet is shared with the owner of the house. Yayang and the residents made

Commented [Joe7]: Results and Discussions are more likely telling the story rather than results. Results are not comprehensive and very subjective.

Commented [Joe8]: Too many discussions on the method; design process, design method. Should more discussions on the results analysis from the toilets.

Formatted: Highlight

Commented [Joe9]: Title figure 1 & figure 2 are same?

Formatted: Highlight

Formatted: Highlight

Commented [Joe10]: ? English revision is necessary

Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. See Fig.3.



Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.
Source: Department of Architecture, Hasanuddin University

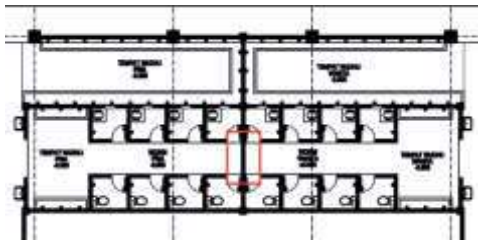


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.
Source: Pillar Bangunindo

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

On Friday the mosque is only visited by men [36]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. See Fig. 4.

Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating. During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where

the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a good quality toilet.

Dedi's idea above turned out to be impossible when he was in charge of designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to carry out his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for a good restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [37]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [38]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process carried out by the architects above is very different from what Yayang did. Project Yayang relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [39]. Citizens are involved since problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants,

but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [40]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [41], [42].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a relatively large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function, but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [43].

The toilet room has the most expensive price 2-3 times compared to the unit price per m² compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include facilities for ablution for Muslims who are the largest community in Indonesia. Usually by reason of needing clean and dirty water networks [44], the ablution place is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablution faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablution room is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablution room is a place to clean the body from najis. Wudhu is a process of cleansing the body of Muslims. Therefore, toileting and ablution activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [45].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan

considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [46]-[48]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [49], [50]. When planned, Dedi's client wanted to present her toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project. Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [51] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [52]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [53]. For Deleuze [54], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of action [55]. Value orientation is always unique and contextual and is owned by each community [56]. Ari's public toilet appears to distinguish it from what is perceived as un-Islamic.

Commented [Joe11]: Same as A. it is too much discussions on telling stories rather than results.

Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects tell about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [57].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [58]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [59]. Consequently, all teaching and learning processes, including the final project studio, must also be carried out using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is

Commented [Joe12]: Same as A & B. Those should be comprehensive discussions results.

judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a relatively long time and relatively large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [60]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education and Participatory Design. Design Methods is carried out with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [61]. The important point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them. In contrast to Design Methods where the roles of the designer and user are defined from the start in the analysis phase [60]. in Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [62].

The approach that architects choose in the process of designing their projects generally uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who handle non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process, it is discussed when it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget is limited. However, for non-government projects / community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though the availability of a limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] J. Boge, S. Callewaert, and K. A. Petersen, "The Impact of Bathroom Design on Privacy for Users with Special Needs," *Ageing Int.*, vol. 44, no. 3, pp. 300–317, 2019.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: Mcgraw-Heal Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] Q. Liu, "Application of Architectural Programming in Architectural Design," in *2019 5th International Conference on Humanities and Social Science Research (ICHSSR 2019)*, 2019, pp. 100–103.
- [11] X. Wang and H. Hua, "Construction and Renovation of Green Buildings in Villages and Towns," in *Green Village and Town Construction in China*, Springer, 2021, pp. 187–223.
- [12] A. A. Bin Ruslan *et al.*, "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] T. A. de Lemos Martins, S. Faraut, and L. Adolphe, "Influence of context-sensitive urban and architectural design factors on the energy demand of buildings in Toulouse, France," *Energy Build.*, vol. 190, pp. 262–278, 2019.
- [14] K. Al-Kodmany, "The Chicago Loop," in *Tall Buildings and the City*, Springer, 2020, pp. 293–368.
- [15] C. L. Marcos and J. Balmer, "Graphic Imprints, Grids and Diagrams in Architecture," in *Congreso Internacional de Expresión Gráfica Arquitectónica*, 2020, pp. 403–417.
- [16] G. E. Meyers, "I Introduction the experience of monumentality in etruscan and early roman architecture," in *Monumentality in Etruscan and Early Roman Architecture*, University of Texas Press, 2021, pp. 1–20.
- [17] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental*

Commented [Joe15]: Refer to the MOST relevant references; public toilets

Commented [Joe13]: It is suggested to have STRUCTURAL design process. Produce the structured design process. Show the empirical results for discussions. Provide the structured **Participatory Design process**.

Commented [Joe14]: CONCLUSIONS are satisfy and fulfilled the common requirements; empirical, technical results.

Formatted: Highlight

Formatted: Highlight

- Science*, 2019, vol. 267, no. 5, p. 52017.
- [18] A. Khakee, "Planning dilemmas," *Plan. Theory Pract.*, vol. 21, no. 1, pp. 175–181, 2020.
- [19] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [20] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [21] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [22] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [23] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [24] C. Harrington, S. Erete, and A. M. Piper, "Deconstructing community-based collaborative design: Towards more equitable participatory design engagements," *Proc. ACM Human-Computer Interact.*, vol. 3, no. CSCW, pp. 1–25, 2019.
- [25] S. Bødker, C. Dindler, O. S. Iversen, and R. C. Smith, "Participatory Design," *Synth. Lect. Human-Centered Informatics*, vol. 14, no. 5, pp. i–143, 2021.
- [26] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [27] The Conversation, "Toilets of the future must be redesigned with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-redesigned-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [28] W.-Z. Cai, N.-S. Chou, M.-F. Tsai, and Y.-C. Lin, "Intelligent Toilet Management System with Internet of Things Technology," in *2019 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW)*, 2019, pp. 1–2.
- [29] O. Kondratyeva, "Gesamtkunstwerk as a formula for creating artistic character in architecture by Volodymyr Pokrovsky," *Archit. Stud.* 1 (5), 2019, no. 1, pp. 27–34, 2019.
- [30] D. P. Doordan, "Introduction. Writing History: Reflections on the Story of Midcentury Modern Architecture," in *Sanctioning Modernism*, University of Texas Press, 2021, pp. 1–6.
- [31] R. Aburamadan and C. Trillo, "Applying design science approach to architectural design development," *Front. Archit. Res.*, vol. 9, no. 1, pp. 216–235, 2020.
- [32] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [33] A. Lareau, *Listening to People: A Practical Guide to Interviewing, Participant Observation, Data Analysis, and Writing It All Up*. University of Chicago Press, 2021.
- [34] U. Kozminska, "Circular design: reused materials and the future reuse of building elements in architecture. Process, challenges and case studies," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 225, no. 1, p. 12033.
- [35] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [36] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [37] O. Bukve, *Designing social science research*. Springer, 2019.
- [38] C. Salazar Ferro, I. Artega Arredondo, C. M. Rodriguez, and D. H. Nadal, "Active learning in architectural education: A participatory design experience (PDE) in Colombia," *Int. J. Art Des. Educ.*, vol. 39, no. 2, pp. 346–366, 2020.
- [39] B. Dixon, L. S. McHattie, and C. Broadley, "The imagination and public participation: a Deweyan perspective on the potential of design innovation and participatory design in policy-making," *CoDesign*, pp. 1–13, 2021.
- [40] M. Cozza, A. Cusinato, and A. Philippopoulos-Mihalopoulos, "Atmosphere in participatory design," *Sci. Cult. (Lond.)*, vol. 29, no. 2, pp. 269–292, 2020.
- [41] C. W. Totten, *Architectural Approach to Level Design*. CRC Press, 2019.
- [42] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [43] M. Byrne and M. Norris, "Housing market financialization, neoliberalism and everyday retrenchment of social housing," *Environ. Plan. A Econ. Sp.*, p. 0308518X19832614, 2019.
- [44] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [45] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [46] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [47] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [48] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [49] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [50] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature

- Singapore Pte.Ltd, 2021.
- [51] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [52] A. Blunden, "The Three Parts of The Philosophy of Right: Right, Morality and Ethical Life," in *Hegel for Social Movements*, Brill, 2019, pp. 180–191.
- [53] R. Scruton, *The aesthetics of architecture*. Princeton University Press, 2021.
- [54] L. Holm, *Brunelleschi, Lacan, Le Corbusier: Architecture, space and the construction of subjectivity*. Routledge, 2020.
- [55] A. Zapko-Willmes, S. H. Schwartz, J. Richter, and C. Kandler, "Basic value orientations and moral foundations: Convergent or discriminant constructs?," *J. Res. Pers.*, vol. 92, p. 104099, 2021.
- [56] H. Wulff, "Writing anthropology," *Cambridge Encycl. Anthropol.*, 2021.
- [57] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [58] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [59] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR." *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyediaan-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [60] D. Kinder, M. E. Reynolds, and N. Burns, *Categorical Politics in Action*. Routledge New Directions in Public Opinion, 2019.
- [61] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [62] J. Hardy and S. Vargas, "Participatory design and the future of rural LGBTQ communities," in *Companion Publication of the 2019 on Designing Interactive Systems Conference 2019 Companion*, 2019, pp. 195–199.

1. The number of words in the abstract should be a minimum of 220 words and a maximum of 250 words.

Answer :

The number of words in the abstract has been made 230 words..

2. The Manuscript consist of 4 chapter : INTRODUCTION, MATERIAL AND METHOD, RESULT AND DISCUSSION, CONCLUSION. Please refer to the template correctly.

Answer :

The rticles already use templates.

3. The manuscript seems doesn't present well, please correct the layout (see Template IJASEIT 2021), make them display nicely, balance them in two couloms. Make sure the manuscript displays fix in every page. Suggestion : save as in DOCX for compatible in any office.

Answer :

The articles already use the DOCX format

4. References should use at least 30 references, with 80% from the latest publication (2019-2022) from journal/proceeding indexing by Scopus.

Answer :

References already refer to .journal/proceeding indexing by Scopus.

5. Citation and Reference in Paper must using Mendeley with IEEE Style.

Answer :

The article already uses Mendeley system with IEEE Style.

Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The data validation use triangulasi test. The results show that the architect's design process generally still uses the Design Methods approach, even though architects do not actually conduct the design phases as theorized by Design Methods.

Deleted: Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design.

Formatted: Not Highlight

Deleted: despite the fact that

Deleted: carry out

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021.

IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the

composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have extraordinarily complex requirements, to function optimally as a facility for the cleaning system for building users.

Deleted: very complex

Deleted: in order

Field Code Changed

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design that are generally for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method was followed by Ching, Snyder, White, Khan, and other famous architects [13]–[17].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [18]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by

common consensus by a homogeneous society. When society is made up of diverse groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [19], [20].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [21]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them. Therefore, to produce a quality design, their involvement is needed [22]–[24].

In reality, professional architects still tend to use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [25], Bratteteig & Wagner (2014) [26] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [27], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [28]–[30].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already conducted collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the Bauhaus workshop they combine distinctive design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [31].

Deleted: fferent

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: guide books

Deleted: intended

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Deleted: still

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: carried out

Deleted: fferent

Field Code Changed

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [32], [33]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [34].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been camouflaged. Research schedule 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia. The results were presented using the narrative method.

TABLE I

RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Informants	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [35].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often confusing because it is difficult to determine which process can perform better than the other [36]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [22]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [37].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to

Field Code Changed
Formatted: Not Highlight
Deleted: ... [1]

Field Code Changed
Field Code Changed
Field Code Changed
Field Code Changed
Formatted: Not Highlight
Field Code Changed

Deleted:
Formatted: Not Highlight
Deleted: changed
Formatted: Not Highlight
Deleted: time
Formatted: Not Highlight
Field Code Changed

Deleted: Number

provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, he decided to cut the corners of the building's triangle (see Figure 1).

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs. See Figure 2.

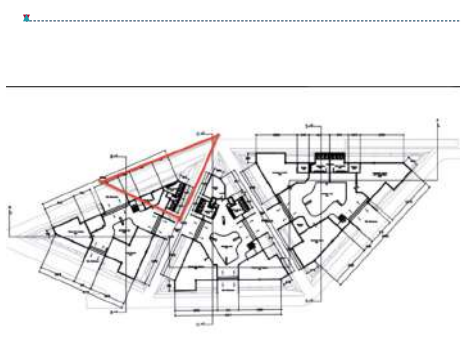
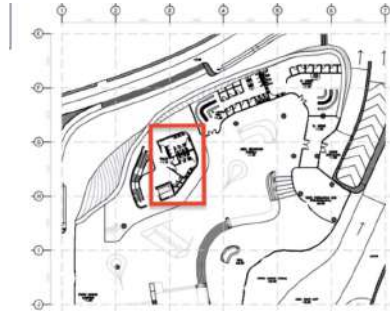


Fig. 1. Bora Project with the triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.

Source: Department of Architecture, Hasanuddin University



Source: Department of Architecture, Hasanuddin University

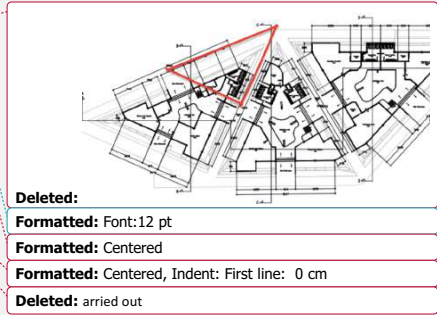
Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is conducted with feedback to the previous stages. They are created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely conducted by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It does not matter if the toilet is shared with the owner of the house. Yayang and the

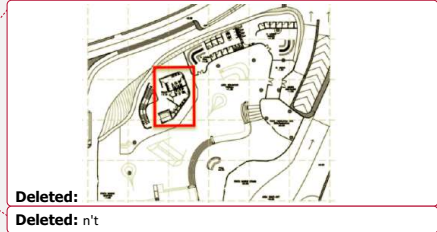
Deleted: . S
Deleted: Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.

Deleted: arried out
Deleted: r



Deleted:
Formatted: Font:12 pt
Formatted: Centered
Formatted: Centered, Indent: First line: 0 cm
Deleted: arried out

Deleted: .
Deleted: T



Deleted:
Deleted: n't

residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. (see Figure 3).

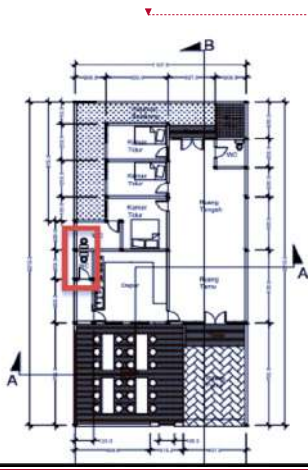


Fig. 3. The owner of the boarding house – cafe provides a simple public toilet for café customers.

Source: Department of Architecture, Hasanuddin University

this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

On Friday the mosque is only visited by men [38]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. (see Figure 4). Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a superior quality toilet.

Dedi's idea above turned out to be impossible when he was oversaw designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to conduct his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from

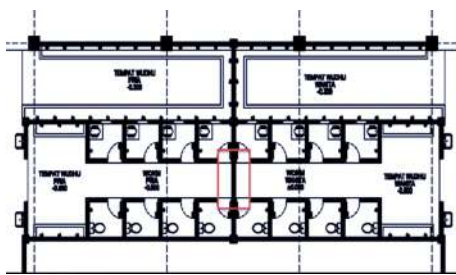
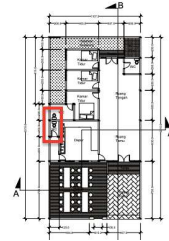


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.

Source: Pillar Bangunindo

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic principles. In

Deleted: s



Deleted:

Field Code Changed

Deleted: s

Deleted: .

Deleted: During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Formatted: Not Highlight

Deleted: good

Deleted: ... [2]

Deleted: in charge of

Deleted: arry out

Deleted: .

Deleted: .

one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for an excellent restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [39], [40]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [41]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process carried out by the architects above is very different from what Yayang did. He project relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [42]. Citizens are involved since problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [43], [44]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [45].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere

function, but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [46].

The toilet room has the most expensive price 2-3 times compared to the unit price per m2 compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include for ablation facility. Usually by reason of needing clean and dirty water networks [47], the facility is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablation faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablation room (wudhu room) is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablation room is a place to clean the body from najis. Ablution is a process of cleansing the body of Muslims. Therefore, toileting and ablation activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [48].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan

Deleted: ,

Field Code Changed

Deleted: good

Deleted: facilities

Deleted: for Muslims who are the largest community in Indonesia.

Deleted: ablation place is

Field Code Changed

Field Code Changed

Field Code Changed

Formatted: Font:Italic

Formatted: Font:Italic

Deleted: Wudhu

Formatted: Font:Italic

Deleted: P

Formatted: Not Highlight

Deleted: Yayang

Formatted: Not Highlight

Formatted: Font:Italic

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

Field Code Changed

Deleted: relatively

considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [49]–[51]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [52], [53]. When planned, Dedi's client wanted to present his toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [54] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [55]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [56]. For Deleuze [57], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of action [58]. Value orientation is always unique and contextual and is owned by each community [59][60]. Ari's public toilet appears distinguishes it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects talk about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [32].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [61]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was

Field Code Changed
Field Code Changed
Field Code Changed
Deleted: to

Field Code Changed

Deleted: tell
Field Code Changed
Deleted: her

Deleted: Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.
Field Code Changed
Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed
Field Code Changed

implemented [62]. Consequently, all teaching and learning processes, including the final project studio, must also be conducted, using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose

working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a long time and large energy compared to that produced by other Yayasan colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [63]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education, that is conducted, with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for

Field Code Changed

Deleted: arried out

Deleted: Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time.

Formatted: Not Highlight

Deleted: relatively

Deleted:

Deleted: relatively

Field Code Changed

Deleted: and Participatory Design. Design Methods

Deleted: arried out

granted by the community [31]. The key point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them [63]. In contrast to Design Methods where the roles of the designer and user are defined from the start in the analysis phase. In Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [64].

The approach that architects choose in the process of designing their projects uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who manage non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process of toilets, it is found that it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget is limited. However, for non-government projects / community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though with limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

[1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J.*

Anthropol., vol. 21, no. 3, pp. 229–247, 2020.

[2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.

[3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.

[4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.

[5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.

[6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.

[7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: Mcgraw-Heal Inc, 2007.

[8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.

[9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.

[10] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.

[11] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.

[12] A. A. Bin Ruslan *et al.*, "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.

[13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.

[14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.

[15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.

Formatted: Not Highlight

Deleted: important

Formatted: Not Highlight

Field Code Changed

Field Code Changed

Deleted: generally

Deleted: handle

Deleted: it is discussed when it is related to

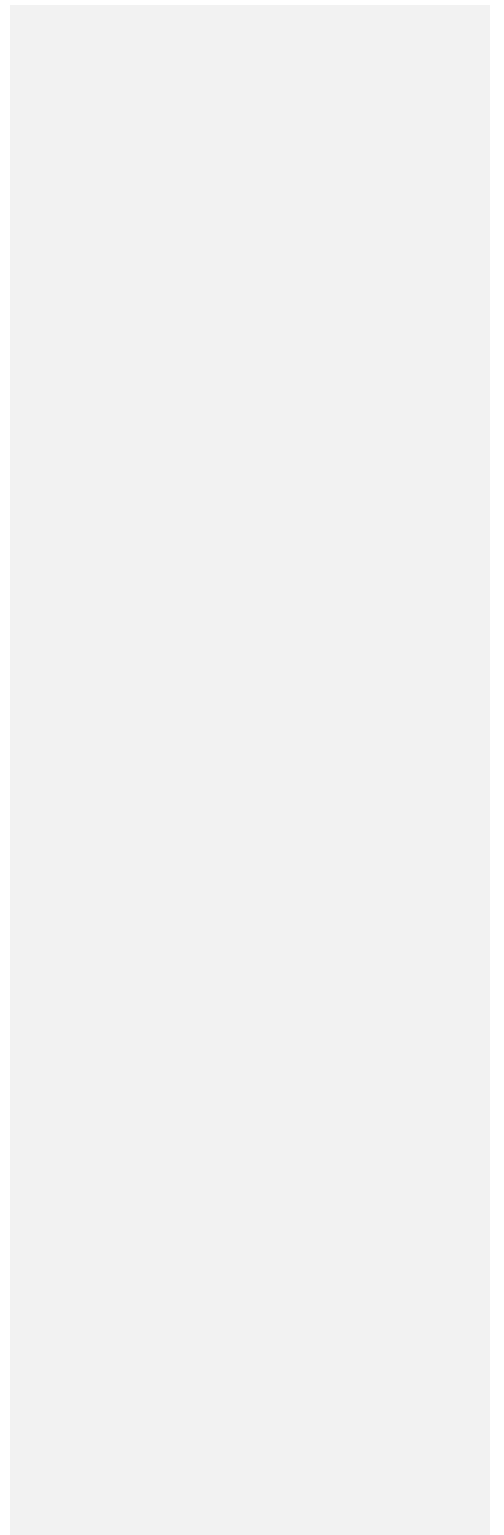
Deleted: the availability of a

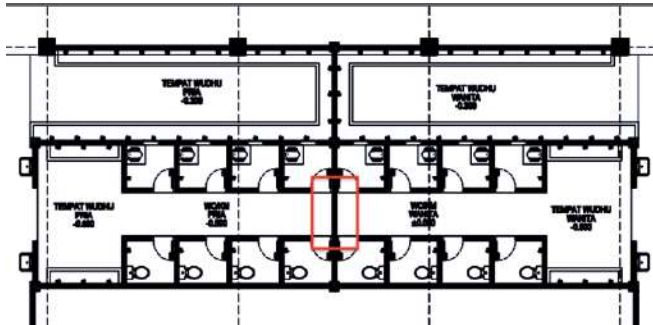
Field Code Changed

- [16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.
- [17] J. C. Snyder, A. J. Catanese, and T. MacGintry, *Introduction to architecture*. McGraw-Hill, 1979.
- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say. In Routledge International Handbook of Participatory Design (J. Simonsen, & T. Robertson, Trans)*. New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [39] K. E. Howell, *An Introduction to the Philosophy of Methodology SAGE Publication London*. Los Angeles: Sage Publications, 2013.
- [40] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog. EG Guba*. London: Sage Publications, Inc, 1990.
- [41] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.
- [42] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation,"

- CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.
- [43] T. Robertson and J. Simonsen, "Participatory Design: an introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.
- [44] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.
- [45] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [46] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.
- [47] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [48] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peaboy: Hendrickson Publisher Inc, 1996.
- [49] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [50] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [51] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [52] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [53] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [54] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [55] G. W. F. Hegel, *Hegel: Elements of the philosophy of right*, Revised. Cambridge: Cambridge University Press, 2017.
- [56] R. Scruton, *The aesthetics of architecture*. Princeton: Princeton University Press, 2013.
- [57] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real*. Routledge, 2016.
- [58] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification*. Cambridge: Harvard University Press, 1951.
- [59] M. D. Hills, "Kluckhohn and Strodtbeck's values orientation theory," *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.
- [60] J. Robbins and J. Sommerschuh, "Values | Cambridge Encyclopedia of Anthropology," 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).
- [61] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantorpusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [62] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka Pencegahan Covid-19 – FAJAR," *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [63] T. Robertson and I. Wagner, "Ethics: Engagement, representation and politics-in-action," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 84–105.
- [64] C. DiSalvo, A. Clement, and V. Pipek, "Communities: Participatory Design for, with and by communities," in

Routledge international handbook of participatory design, Routledge, 2012, pp. 202–230.





Reviewer A:

Improve the appearance of the image, your image is still not clearly legible in this paper, because the size of your image is in a small proportion, so it is not clearly legible.

Answer:

Thank you for comment. We have revised the article

Correct the writing correctly according to the correct writing and grammatical conditions, according to English and see the template of journal. Please check again according to the correct procedure.

Answer:

Thank you for comment. We have revised the article

Reviewer C:

Thank you for submitting your valuable research findings. However, we still need you to improve the quality of the manuscript according to the reviewer's comments :

Please, find attached review comments (in journal system).

Answer :

The article has been changed. See the article track change system.

Reviewer D:

- This is interesting research and study. However, some comments should be considered.

- Abstract: need additional discussions on the issues, method, and results.

Answer:

The abstract is already a summary of the entire article.

Introduction: the theory and concept are too long. There should be more discussions on the main issue; the toilet.

Answer:

The abstract is already a summary of the entire article.

- Method: is not clear, no comprehensive discussions on the concept/method; DESIGN METHOD, PARTICIPATORY DESIGN PROCESS. WHAT are the differences.

Answer:

In this article, the findings that must be discussed are the similarities and differences in concepts between the two design approaches, where the Design Method uses a standard design, while the Participatory Design uses the client's thinking contextually.

- ENGLISH Grammar needs revisions.

Answer:

The article has been revised.

- Results and Discussions: are more likely to tell the story rather than results. Results are not comprehensive and very subjective. Should more discussions on the analysis of the results from the toilets.

Answer :

This research was conducted with a qualitative approach . Validation of the data using triangulation test, where the data are compared with each other by the narrative method. It has been added to the Material and Method section.

- Figure 1 and Figure 2 are the same titles? Is it true?.

Answer :

The article has been revised.

Figure 1 and Figure 2 have been revised.

- III. Results and Discussion; A, B, and C are too many discussions rather than presenting the results.

Answer :

This study uses a qualitative approach in which research results are communicated using the narrative method. It has been added to the

Materials and Methods section. The discussion has been shortened. See the article track change system.

- CONCLUSIONS: is not satisfied. It is suggested to have a STRUCTURAL design process. Produce the structured design process. Show the empirical results for discussions.

Provide the structured Participatory Design process. It is better to have a comprehensive discussion on the conclusions; empirical and technical results.

Answer :

In the discussion section, it is hoped that dialogue will occur not only to be fixated on the standard Design Method thinking process where the client is only an informant, there are opportunities to involve the client as well as being part of the building design work as happened in Participatory Design.

Use the most relevant references; technology, toilets.

Answer :

It has been done except for technology, because this research discusses the design thinking process and not how to design in detail.

PUBLIC TOILETS DESIGN THINKING IN THE ARCHITECTURE DESIGN PROCESS

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The data validation use triangulasi test. The results show that the architect's design process generally still uses the Design Methods approach, even though architects do not actually conduct the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021.

IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have extraordinarily complex requirements to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body

waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design that are generally for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use

Formatted: Heading 1, Indent: Left: 0 cm, Right: 0 cm

Deleted: Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design.

Formatted: Not Highlight

Deleted: despite the fact that

Deleted: carry out

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: very complex

Deleted: in order

Deleted: guide books

Deleted: intended

Field Code Changed

Field Code Changed

Field Code Changed

rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method was followed by Ching, Snyder, White, Khan, and other famous architects [13]–[17].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [18]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of diverse groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [19], [20].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [21]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them.

Therefore, to produce a quality design, their involvement is needed [22]–[24].

In reality, professional architects still tend to use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [25], Bratteteig & Wagner (2014) [26] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [27], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [28]–[30].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already conducted collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the Bauhaus workshop they combine distinctive design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [31].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [32], [33]. Perspectives as insiders and

Field Code Changed

Formatted: Not Highlight

Deleted: still

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: carried out

Deleted: fferent

Field Code Changed

Deleted: fferent

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

outsiders are ethnographic research methods built and constructed using emic and etic analogies [34].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been camouflaged. Research schedule 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia. The results were presented using the narrative method.

TABLE I

RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
Total Informants		98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [35].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often confusing because it is difficult to determine which process can

perform better than the other [36]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [22]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [37].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, he decided to cut the corners of the building's triangle (see Figure 1).

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora is consistent with his choice of building form. The entire

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

Field Code Changed

Deleted:

Deleted: changed

Formatted: Not Highlight

Formatted: Not Highlight

Deleted: time

Formatted: Not Highlight

Field Code Changed

Deleted: Number

Field Code Changed

Deleted: -

... [1]

Deleted: . s

design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectang

ular shapes commonly found in toilet designs (see Figure 2).

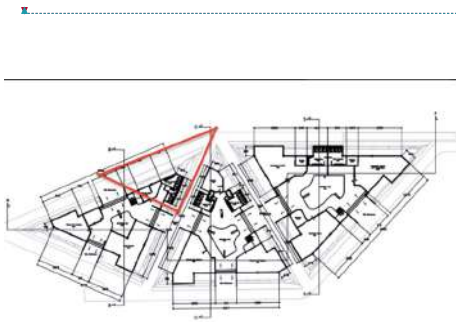
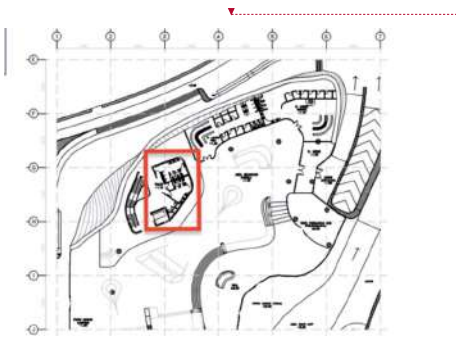


Fig. 1. Bora Project with the triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.

Source: Department of Architecture, Hasanuddin University



Source: Department of Architecture, Hasanuddin University

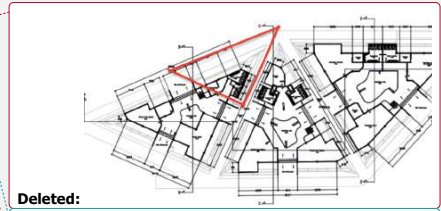
Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is conducted with feedback to the previous stages. They are created with the concept of

function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely conducted by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It does not matter if the toilet is shared with the owner of the house. Yayang and the residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. (see Figure 3).

Deleted: s



Deleted:

Formatted: Font:12 pt

Formatted: Centered

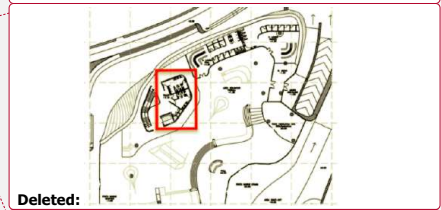
Deleted: arried out

Formatted: Centered, Indent: First line: 0 cm

Deleted: -

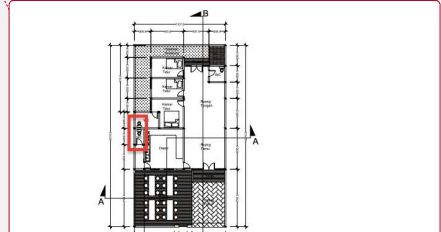
Deleted: T

Deleted: n't



Deleted:

Deleted: s



Deleted:

Deleted: Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.

Deleted: arried out

Deleted: r

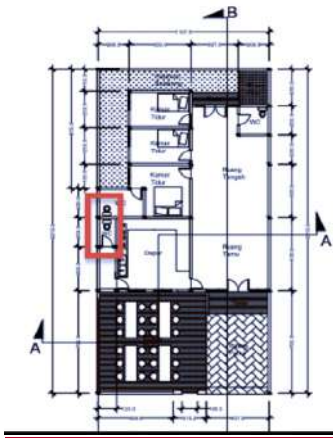


Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.

Source: Department of Architecture, Hasanuddin University

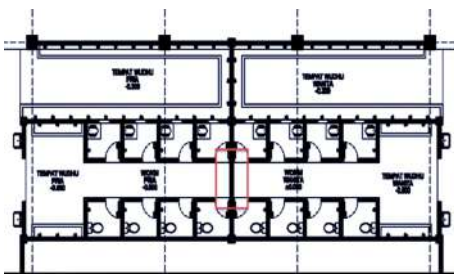


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.

Source: Pillar Bangunindo

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

On Friday the mosque is only visited by men [38]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. (see Figure 4). Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a superior quality toilet.

Dedi's idea above turned out to be impossible when he was *oversaw* designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to *conduct* his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with

Field Code Changed

Deleted: s

Deleted: .

Deleted: During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Formatted: Not Highlight

Deleted: . [2]

Deleted: good

Deleted: in charge of

Deleted: .

Deleted: arry out

Deleted: .

the principle that the availability of adequate public toilets is a prerequisite for an excellent restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [39], [40]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [41]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process carried out by the architects above is very different from what Yayang did. He project relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [42]. Citizens are involved since problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [43], [44]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [45].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [46].

The toilet room has the most expensive price 2-3 times compared to the unit price per m2 compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include for ablation facility. Usually by reason of needing clean and dirty water networks [47], the facility is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablation faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablation room (wudhu room) is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablation room is a place to clean the body from najis. Ablution is a process of cleansing the body of Muslims. Therefore, toileting and ablation activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [48].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Deleted: good

Deleted: facilities

Deleted: for Muslims who are the largest community in Indonesia.

Deleted: ablation place is

Field Code Changed

Field Code Changed

Field Code Changed

Formatted: Font:Italic

Formatted: Font:Italic

Deleted: Wudhu

Formatted: Font:Italic

Deleted: P

Formatted: Not Highlight

Deleted: Yayang

Formatted: Not Highlight

Formatted: Font:Italic

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

Field Code Changed

Deleted: relatively

Deleted: ,

Field Code Changed

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [49]–[51]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [52], [53]. When planned, Dedi's client wanted to present his toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [54] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [55]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [56]. For Deleuze [57], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in

buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of action [58]. Value orientation is always unique and contextual and is owned by each community [59][60]. Ari's public toilet appears, distinguishes it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects talk about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [32].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [61]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [62]. Consequently, all teaching and learning processes, including the final project studio, must also be conducted using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even

Field Code Changed
Field Code Changed
Field Code Changed
Deleted: to

Field Code Changed

Field Code Changed
Deleted: tell
Deleted: her

Deleted: Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Field Code Changed
Field Code Changed

Field Code Changed
Field Code Changed

Field Code Changed
Field Code Changed

Field Code Changed

Deleted: arried out

though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a long time and large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [63]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education, that is conducted with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [31]. The key point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them [63]. In contrast to Design Methods

Deleted: Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time. -

Formatted: Not Highlight

Deleted: relatively

Deleted:

Deleted: relatively

Field Code Changed

Deleted: and Participatory Design. Design Methods

Deleted: arried out

Field Code Changed

Formatted: Not Highlight

Deleted: important

Formatted: Not Highlight

where the roles of the designer and user are defined from the start in the analysis phase. In Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [64].

The approach that architects choose in the process of designing their projects uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who manage non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process of toilets, it is found that it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget is limited. However, for non-government projects / community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though with limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.

- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: McGraw-Hill Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.
- [11] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.
- [12] A. A. Bin Ruslan et al., "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.
- [14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.
- [15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.
- [16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.
- [17] J. C. Snyder, A. J. Catanese, and T. MacGintry, *Introduction to architecture*. McGraw-Hill, 1979.

Field Code Changed

Deleted: generally

Deleted: handle

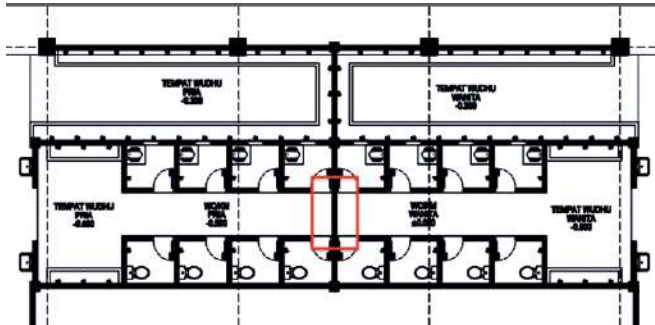
Deleted: it is discussed when it is related to

Deleted: the availability of a

Field Code Changed

- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say*. In *Routledge International Handbook of Participatory Design* (J. Simonsen, & T. Robertson, Trans). New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [39] K. E. Howell, *An Introduction to the Philosophy of Methodology* SAGE Publication London. Los Angeles: Sage Publications, 2013.
- [40] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog*. EG Guba. London: Sage Publications, Inc, 1990.
- [41] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.
- [42] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.
- [43] T. Robertson and J. Simonsen, "Participatory Design: an introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.

- [44] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.
- [45] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [46] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.
- [47] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [48] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [49] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [50] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [51] E. Elisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [52] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [53] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [54] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [55] G. W. F. Hegel, *Hegel: Elements of the philosophy of right*, Revised. Cambridge: Cambridge University Press, 2017.
- [56] R. Scruton, *The aesthetics of architecture*. Princeton: Princeton University Press, 2013.
- [57] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real*. Routledge, 2016.
- [58] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification*. Cambridge: Harvard University Press, 1951.
- [59] M. D. Hills, "Kluckhohn and Strodtbeck's values orientation theory," *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.
- [60] J. Robbins and J. Sommerschuh, "Values | Cambridge Encyclopedia of Anthropology," <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).
- [61] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantorpusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [62] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR," *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyediaan-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [63] T. Robertson and I. Wagner, "Ethics: Engagement, representation and politics-in-action," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 84–105.
- [64] C. DiSalvo, A. Clement, and V. Pipek, "Communities: Participatory Design for, with and by communities," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 202–230.



Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design.

In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The results show that the architect's design process generally still uses the Design Methods approach, despite the fact that architects do not actually carry out the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021. IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have very complex requirements in order to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a

public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design guide books that are generally intended for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method

Formatted: Highlight

Commented [Joe1]: issue

Commented [Joe2]: INTRODUCTION is suggested to be revised. Too many theory and discussions on the methods. Should more discussions on the issue; toilet.

Formatted: Underline

Commented [Joe3]: WHAT would be the main aspects of the public toilets; esthetic? or quality systems?. Architects = esthetics?

Formatted: Highlight

Formatted: Highlight

was followed by Ching, Snyder, White, Khan, and other famous archit [13]–[16].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [17]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of different groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [18], [19].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [20]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them. Therefore, to produce a quality design, their involvement is needed [21], [22].

In reality, professional architects tend to still use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [23], Harington, et.al (2019) [24] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [25], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [26]–[28].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already carried out collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the

Bauhaus workshop they combine different design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [29].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [30], [31]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [32].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been changed. Research time 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia.

TABLE I
RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Number	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [33].

Commented [Joe4]: METHOD is not discussed. Please provide the DESIGN METHOD/PROCESS and PARTICIPATORY DESIGN PROCESS. WHAT are differences between this tow concepts.

Commented [Joe5]: Duration?. English grammar is important.

Formatted: Highlight

Commented [Joe6]: Respondents?. Choose the appropriate word

Formatted: Highlight

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often confusing because it is difficult to determine which process can perform better than the other [34]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [21]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [35].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, He decided to cut the corners of the building's triangle. See Fig. 1.

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs. See Fig. 2.



Fig. 1. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Source: Department of Architecture, Hasanuddin University



Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Source: Department of Architecture, Hasanuddin University

Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is carried out with feedback to the previous stages. They are created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely carried out by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It doesn't matter if the toilet is shared with the owner of the house. Yayang and the residents made

Commented [Joe7]: Results and Discussions are more likely telling the story rather than results. Results are not comprehensive and very subjective.

Commented [Joe8]: Too many discussions on the method; design process, design method. Should more discussions on the results analysis from the toilets.

Formatted: Highlight

Commented [Joe9]: Title figure 1 & figure 2 are same?

Formatted: Highlight

Formatted: Highlight

Commented [Joe10]: ? English revision is necessary

Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. See Fig.3.



Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.
Source: Department of Architecture, Hasanuddin University

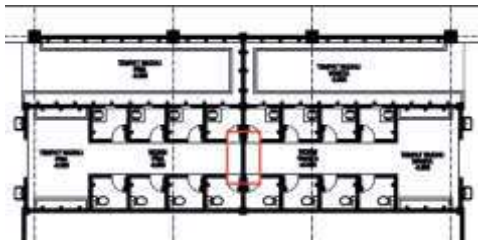


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.
Source: Pillar Bangunindo

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

On Friday the mosque is only visited by men [36]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. See Fig. 4.

Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating. During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where

the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a good quality toilet.

Dedi's idea above turned out to be impossible when he was in charge of designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to carry out his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for a good restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [37]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [38]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process carried out by the architects above is very different from what Yayang did. Project Yayang relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [39]. Citizens are involved since problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants,

but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [40]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [41], [42].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a relatively large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function, but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [43].

The toilet room has the most expensive price 2-3 times compared to the unit price per m² compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include facilities for ablution for Muslims who are the largest community in Indonesia. Usually by reason of needing clean and dirty water networks [44], the ablution place is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablution faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablution room is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablution room is a place to clean the body from najis. Wudhu is a process of cleansing the body of Muslims. Therefore, toileting and ablution activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [45].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan

considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [46]-[48]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [49], [50]. When planned, Dedi's client wanted to present her toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project. Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [51] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [52]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [53]. For Deleuze [54], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of action [55]. Value orientation is always unique and contextual and is owned by each community [56]. Ari's public toilet appears to distinguish it from what is perceived as un-Islamic.

Commented [Joe11]: Same as A. it is too much discussions on telling stories rather than results.

Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects tell about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [57].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [58]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [59]. Consequently, all teaching and learning processes, including the final project studio, must also be carried out using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is

Commented [Joe12]: Same as A & B. Those should be comprehensive discussions results.

judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a relatively long time and relatively large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [60]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education and Participatory Design. Design Methods is carried out with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [61]. The important point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them. In contrast to Design Methods where the roles of the designer and user are defined from the start in the analysis phase [60]. in Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [62].

The approach that architects choose in the process of designing their projects generally uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who handle non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process, it is discussed when it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget is limited. However, for non-government projects / community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though the availability of a limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] J. Boge, S. Callewaert, and K. A. Petersen, "The Impact of Bathroom Design on Privacy for Users with Special Needs," *Ageing Int.*, vol. 44, no. 3, pp. 300–317, 2019.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: Mcgraw-Heal Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] Q. Liu, "Application of Architectural Programming in Architectural Design," in *2019 5th International Conference on Humanities and Social Science Research (ICHSSR 2019)*, 2019, pp. 100–103.
- [11] X. Wang and H. Hua, "Construction and Renovation of Green Buildings in Villages and Towns," in *Green Village and Town Construction in China*, Springer, 2021, pp. 187–223.
- [12] A. A. Bin Ruslan *et al.*, "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] T. A. de Lemos Martins, S. Faraut, and L. Adolphe, "Influence of context-sensitive urban and architectural design factors on the energy demand of buildings in Toulouse, France," *Energy Build.*, vol. 190, pp. 262–278, 2019.
- [14] K. Al-Kodmany, "The Chicago Loop," in *Tall Buildings and the City*, Springer, 2020, pp. 293–368.
- [15] C. L. Marcos and J. Balmer, "Graphic Imprints, Grids and Diagrams in Architecture," in *Congreso Internacional de Expresión Gráfica Arquitectónica*, 2020, pp. 403–417.
- [16] G. E. Meyers, "I Introduction the experience of monumentality in etruscan and early roman architecture," in *Monumentality in Etruscan and Early Roman Architecture*, University of Texas Press, 2021, pp. 1–20.
- [17] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental*

Commented [Joe15]: Refer to the MOST relevant references; public toilets

Commented [Joe13]: It is suggested to have STRUCTURAL design process. Produce the structured design process. Show the empirical results for discussions. Provide the structured **Participatory Design process**.

Commented [Joe14]: CONCLUSIONS are satisfy and fulfilled the common requirements; empirical, technical results.

Formatted: Highlight

Formatted: Highlight

- Science*, 2019, vol. 267, no. 5, p. 52017.
- [18] A. Khakee, "Planning dilemmas," *Plan. Theory Pract.*, vol. 21, no. 1, pp. 175–181, 2020.
- [19] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [20] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [21] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [22] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [23] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [24] C. Harrington, S. Erete, and A. M. Piper, "Deconstructing community-based collaborative design: Towards more equitable participatory design engagements," *Proc. ACM Human-Computer Interact.*, vol. 3, no. CSCW, pp. 1–25, 2019.
- [25] S. Bødker, C. Dindler, O. S. Iversen, and R. C. Smith, "Participatory Design," *Synth. Lect. Human-Centered Informatics*, vol. 14, no. 5, pp. i–143, 2021.
- [26] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [27] The Conversation, "Toilets of the future must be redesigned with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-redesigned-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [28] W.-Z. Cai, N.-S. Chou, M.-F. Tsai, and Y.-C. Lin, "Intelligent Toilet Management System with Internet of Things Technology," in *2019 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW)*, 2019, pp. 1–2.
- [29] O. Kondratyeva, "Gesamtkunstwerk as a formula for creating artistic character in architecture by Volodymyr Pokrovsky," *Archit. Stud.* 1 (5), 2019, no. 1, pp. 27–34, 2019.
- [30] D. P. Doordan, "Introduction. Writing History: Reflections on the Story of Midcentury Modern Architecture," in *Sanctioning Modernism*, University of Texas Press, 2021, pp. 1–6.
- [31] R. Aburamadan and C. Trillo, "Applying design science approach to architectural design development," *Front. Archit. Res.*, vol. 9, no. 1, pp. 216–235, 2020.
- [32] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [33] A. Lareau, *Listening to People: A Practical Guide to Interviewing, Participant Observation, Data Analysis, and Writing It All Up*. University of Chicago Press, 2021.
- [34] U. Kozminska, "Circular design: reused materials and the future reuse of building elements in architecture. Process, challenges and case studies," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 225, no. 1, p. 12033.
- [35] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [36] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [37] O. Bukve, *Designing social science research*. Springer, 2019.
- [38] C. Salazar Ferro, I. Artega Arredondo, C. M. Rodriguez, and D. H. Nadal, "Active learning in architectural education: A participatory design experience (PDE) in Colombia," *Int. J. Art Des. Educ.*, vol. 39, no. 2, pp. 346–366, 2020.
- [39] B. Dixon, L. S. McHattie, and C. Broadley, "The imagination and public participation: a Deweyan perspective on the potential of design innovation and participatory design in policy-making," *CoDesign*, pp. 1–13, 2021.
- [40] M. Cozza, A. Cusinato, and A. Philippopoulos-Mihalopoulos, "Atmosphere in participatory design," *Sci. Cult. (Lond.)*, vol. 29, no. 2, pp. 269–292, 2020.
- [41] C. W. Totten, *Architectural Approach to Level Design*. CRC Press, 2019.
- [42] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [43] M. Byrne and M. Norris, "Housing market financialization, neoliberalism and everyday retrenchment of social housing," *Environ. Plan. A Econ. Sp.*, p. 0308518X19832614, 2019.
- [44] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021. doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [45] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [46] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [47] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [48] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [49] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [50] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature

- Singapore Pte.Ltd, 2021.
- [51] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
 - [52] A. Blunden, "The Three Parts of The Philosophy of Right: Right, Morality and Ethical Life," in *Hegel for Social Movements*, Brill, 2019, pp. 180–191.
 - [53] R. Scruton, *The aesthetics of architecture*. Princeton University Press, 2021.
 - [54] L. Holm, *Brunelleschi, Lacan, Le Corbusier: Architecture, space and the construction of subjectivity*. Routledge, 2020.
 - [55] A. Zapko-Willmes, S. H. Schwartz, J. Richter, and C. Kandler, "Basic value orientations and moral foundations: Convergent or discriminant constructs?," *J. Res. Pers.*, vol. 92, p. 104099, 2021.
 - [56] H. Wulff, "Writing anthropology," *Cambridge Encycl. Anthropol.*, 2021.
 - [57] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
 - [58] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djp.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
 - [59] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR." *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyediaan-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
 - [60] D. Kinder, M. E. Reynolds, and N. Burns, *Categorical Politics in Action*. Routledge New Directions in Public Opinion, 2019.
 - [61] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
 - [62] J. Hardy and S. Vargas, "Participatory design and the future of rural LGBTQ communities," in *Companion Publication of the 2019 on Designing Interactive Systems Conference 2019 Companion*, 2019, pp. 195–199.

PUBLIC TOILETS DESIGN THINKING IN THE ARCHITECTURE DESIGN PROCESS

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The data validation and analysis use triangulasi test. The results show that the architect's design process generally still uses the Design Methods approach, even though architects do not actually conduct the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021.

IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have extraordinarily complex requirements to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body

waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design that are generally for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use

Formatted: Heading 1, Indent: Left: 0 cm, Right: 0 cm

Deleted: Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design.

Formatted: Not Highlight

Deleted: despite the fact that

Deleted: carry out

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: very complex

Deleted: in order

Deleted: guide books

Deleted: intended

Field Code Changed

Field Code Changed

Field Code Changed

rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method was followed by Ching, Snyder, White, Khan, and other famous architects [13]–[17].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [18]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of diverse groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [19], [20].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [21]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them.

Therefore, to produce a quality design, their involvement is needed [22]–[24].

In reality, professional architects still tend to use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [25], Bratteteig & Wagner (2014) [26] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [27], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [28]–[30].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already conducted collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the Bauhaus workshop they combine distinctive design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [31].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [32], [33]. Perspectives as insiders and

Field Code Changed

Formatted: Not Highlight

Deleted: still

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: carried out

Deleted: fferent

Field Code Changed

Deleted: fferent

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

outsiders are ethnographic research methods built and constructed using emic and etic analogies [34].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been camouflaged. Research schedule 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia. The data validation and analysis use triangulasi test. The results were presented using the narrative method.

TABLE I

RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
Total Informants		98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [35].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often confusing

because it is difficult to determine which process can perform better than the other [36]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [22]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [37].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, he decided to cut the corners of the building's triangle (see Figure 1).

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora

Field Code Changed
Field Code Changed
Formatted: Not Highlight
Field Code Changed
Field Code Changed

Deleted:
Deleted: changed
Formatted: Not Highlight
Formatted: Not Highlight
Deleted: time
Formatted: Not Highlight
Field Code Changed

Deleted: Number

Field Code Changed

Deleted: ... [1]

Deleted: . s

is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectang

ular shapes commonly found in toilet designs (see Figure 2).

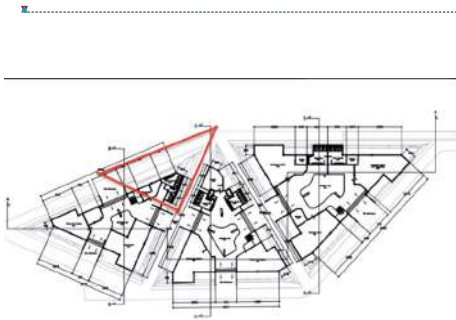
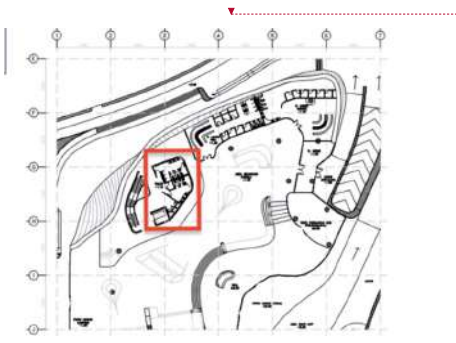


Fig. 1. Bora Project with the triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.

Source: Department of Architecture, Hasanuddin University



Source: Department of Architecture, Hasanuddin University

Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is conducted with feedback to

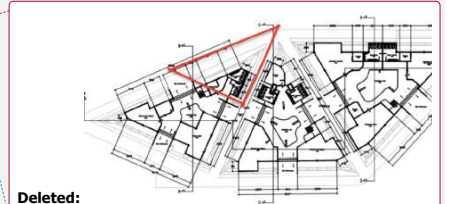
the previous stages. They created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely conducted by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It does not matter if the toilet is shared with the owner of the house. Yayang and the residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. (see Figure 3).

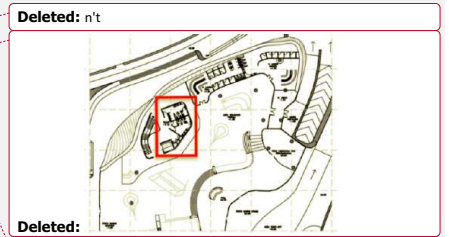
Deleted: are
Deleted: r

Deleted: s

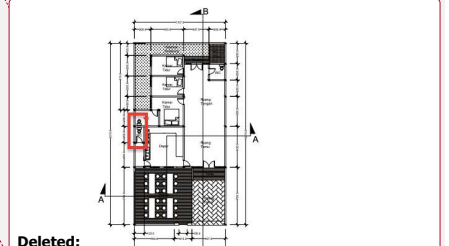


Deleted:
Formatted: Font: 12 pt
Formatted: Centered
Deleted: arried out
Formatted: Centered, Indent: First line: 0 cm

Deleted: .
Deleted: T



Deleted: n't
Deleted: s



Deleted:
Deleted: Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Deleted: arried out

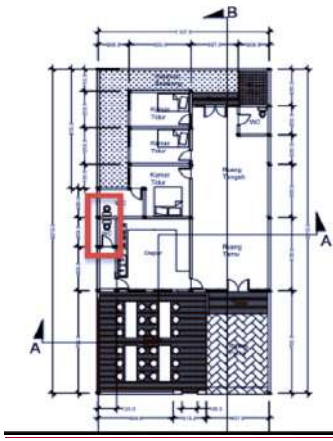


Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.

Source: Department of Architecture, Hasanuddin University

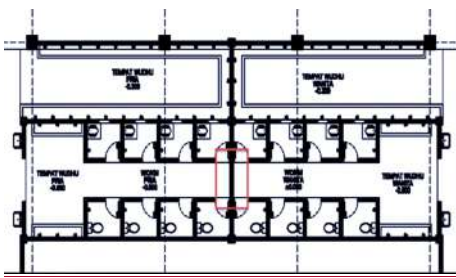


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.

Source: Pillar Bangunindo

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

On Friday the mosque is only visited by men [38]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. (see Figure 4). Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a superior quality toilet.

Dedi's idea above turned out to be impossible when he was oversaw designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to conduct his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with

Field Code Changed

Deleted: s

Deleted: .

Deleted: During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Formatted: Not Highlight

Deleted: .

... [2]

Deleted: good

Deleted: in charge of

Deleted: .

Deleted: arry out

Deleted: .

the principle that the availability of adequate public toilets is a prerequisite for an excellent restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [39], [40]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [41]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process conducted by the architects above is very different from what Yayang did. Their project relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [42]. Citizens are involved since problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [43], [44]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [45].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [46].

The toilet room has the most expensive price 2-3 times compared to the unit price per m2 compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include for ablation facility. Usually by reason of needing clean and dirty water networks [47], the facility is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablation faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablation room (wudhu room) is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablation room is a place to clean the body from najis. Ablution is a process of cleansing the body of Muslims. Therefore, toileting and ablation activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [48].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Deleted: good

Deleted: facilities

Deleted: for Muslims who are the largest community in Indonesia.

Deleted: ablation place is

Field Code Changed

Field Code Changed

Field Code Changed

Formatted: Font:Italic

Deleted: Wudhu

Formatted: Font:Italic

Formatted: Font:Italic

Deleted: carried out

Deleted: P

Formatted: Not Highlight

Deleted: Yayang

Formatted: Not Highlight

Formatted: Font:Italic

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

Field Code Changed

Deleted: relatively

Deleted: ,

Field Code Changed

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [49]–[51]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [52], [53]. When planned, Dedi's client wanted to present his toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [54] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [55]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [56]. For Deleuze [57], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in

buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of action [58]. Value orientation is always unique and contextual and is owned by each community [59][60]. Ari's public toilet appears, distinguishes it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects talk about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [32].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [61]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [62]. Consequently, all teaching and learning processes, including the final project studio, must also be conducted using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: to

Field Code Changed

Field Code Changed

Deleted: tell

Deleted: her

Deleted: Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: arried out

though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a long time and large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [63]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education, that is conducted with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [31]. The key point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them [63]. In contrast to Design Methods

Deleted: Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time. -

Formatted: Not Highlight

Deleted: relatively

Deleted:

Deleted: relatively

Field Code Changed

Deleted: and Participatory Design. Design Methods

Deleted: arried out

Field Code Changed

Formatted: Not Highlight

Deleted: important

Formatted: Not Highlight

where the roles of the designer and user are defined from the start in the analysis phase. in Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [64].

The approach that architects choose in the process of designing their projects uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who manage non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process of toilets, it is found that it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget and time availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget and time are limited. However, for non-government projects / community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though with limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

[1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.

[2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp.

908–926, 2019.

[3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.

[4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.

[5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.

[6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.

[7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: McGraw-Hill Inc, 2007.

[8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.

[9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.

[10] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.

[11] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.

[12] A. A. Bin Ruslan et al., "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.

[13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.

[14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.

[15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.

[16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.

[17] J. C. Snyder, A. J. Catanese, and T. MacGintry,

Field Code Changed

Deleted: generally

Deleted: handle

Deleted: it is discussed when it is related to

Deleted: is

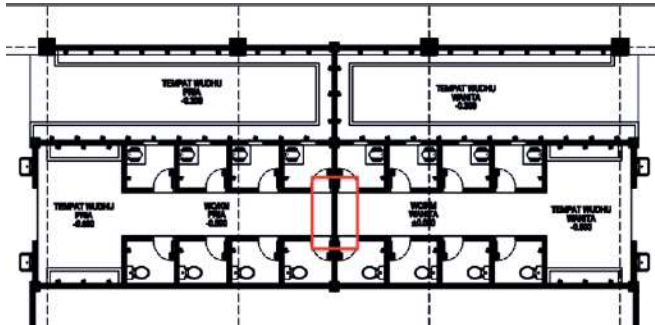
Deleted: the availability of a

Field Code Changed

Introduction to architecture. McGraw-Hill, 1979.

- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say*. In *Routledge International Handbook of Participatory Design* (J. Simonsen, & T. Robertson, Trans). New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: MIT Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [39] K. E. Howell, *An Introduction to the Philosophy of Methodology* SAGE Publication London. Los Angeles: Sage Publications, 2013.
- [40] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog*. EG Guba. London: Sage Publications, Inc, 1990.
- [41] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.
- [42] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.
- [43] T. Robertson and J. Simonsen, "Participatory Design: an

- introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.
- [44] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.
- [45] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [46] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.
- [47] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [48] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [49] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [50] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [51] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [52] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [53] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [54] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [55] G. W. F. Hegel, *Hegel: Elements of the philosophy of right*, Revised. Cambridge: Cambridge University Press, 2017.
- [56] R. Scruton, *The aesthetics of architecture*. Princeton: Princeton University Press, 2013.
- [57] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real*. Routledge, 2016.
- [58] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification*. Cambridge: Harvard University Press, 1951.
- [59] M. D. Hills, "Kluckhohn and Strodtbeck's values orientation theory," *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.
- [60] J. Robbins and J. Sommerschuh, "Values | Cambridge Encyclopedia of Anthropology," 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).
- [61] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djpb.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [62] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR," *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyediaan-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [63] T. Robertson and I. Wagner, "Ethics: Engagement, representation and politics-in-action," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 84–105.
- [64] C. DiSalvo, A. Clement, and V. Pipek, "Communities: Participatory Design for, with and by communities," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 202–230.



Reviewer C:

- Quality papers have been improved.
- Formatting and English seem better and more suitable.
- However, it seems the authors did not make any improvement based on my review. Therefore, please refer to my comments, and make improvements.
- I hope, the authors can finalize the paper based on my comments soon.

Answer :

Dear Reviewer thank you for your comment. We have revised our manuscript in a track change mode as per commented.

1. Highlight
2. A qualitative approach must be conduct with triangulation test. That is why it requires a lot of discussion. But some of the discussion has been shortened.
3. **Aersthetic** and not only quality.
4. One of the reasons for the qualitative approach is to obtain the perspective of differences and similarities in meaning by using a triangulation test.
5. Duration → Research **schedule** 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia.
6. Informant and not responden → they are involved in activities and discussions.
7. A qualitative research in the socio-cultural field is a telling story.
The analysis was conduct by comparing the meaning between one informant and another.
8. See 2.
9. Figure 1 and Fifure 2 have been revised.
10. They **are** created with the concept of ...
11. See 2
12. A describes the procedure of thinking when designing a toilet. B describes how much the project costs are available. C describes how the time is limited in completing the design.
13. See Abstract, Methods and Conclusion.

PUBLIC TOILETS DESIGN THINKING IN THE ARCHITECTURE DESIGN PROCESS

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Jalan Poros Malino Km. 6 Bontomarannu, Kabupaten Gowa, 92172, Indonesia

*Corresponding author: triyatni@gmail.com

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, in the design process it does not take special time to discuss them. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. In terms of public toilets, architects still use existing universal standards and have not involved users to produce public toilets that are in accordance with their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects and their clients. The research method with a qualitative approach uses a constructive paradigm. The data validation and analysis use triangulasi test. The results show that the architect's design process generally still uses the Design Methods approach, even though architects do not actually conduct the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received xx xxx. 2021; revised xx xxx. 20xx; accepted 2 Feb. 2021. Date of publication 17 Feb. 2021.

IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In institutions that are rich and whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of architectural space, the toilet is not the main activity room of a building, but a service room. However, toilets have extraordinarily complex requirements to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body

waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3] the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a public toilet that meets the rational requirements but is also in accordance with local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on design that are generally for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7] or Architect Data [8]. Architects as experts use

Formatted: Heading 1, Indent: Left: 0 cm, Right: 0 cm

Deleted: Although the design process appears to have shifted, there is no sufficient track record to show that the architect has switched to Participatory Design.

Formatted: Not Highlight

Deleted: despite the fact that

Deleted: carry out

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: very complex

Deleted: in order

Deleted: guide books

Deleted: intended

Field Code Changed

Field Code Changed

Field Code Changed

rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Christopher Alexander and Christopher Jones influenced the educational system and design practice. Since the 1960s, this movement was introduced to architecture students to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method was followed by Ching, Snyder, White, Khan, and other famous architects [13]–[17].

In design classes, students solve architectural problems using Project Based Learning or Case Study methods. The same thing they do when working as an architect. Design Methods using a rationalist and generalist approach aims to support industry and mass products in the era of modern architecture [18]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The focus of the approach is to design according to the conditions of the physical environment and developing technology without involving the participation of users and the cultural meanings of the local community.

The Design Methods movement received a reaction from W Horst W. J. Rittel and Melvin M. Webber, who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because these problems can be defined, understood, and agreed upon by common consensus by a homogeneous society. When society is made up of diverse groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. Issues that drive the need for argumentation methods in the design process [19], [20].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [21]. The architects then turned to the Cooperative Design (Co-Design) process method which is better known as Participatory Design where architects work in partnership with stakeholders and design according to local cultural meanings. They began to position the local community as the party who knows best what they need. Users are considered to be the ones who have the most knowledge of what they practice and need and the designer is the technical consultant who accompanies them.

Therefore, to produce a quality design, their involvement is needed [22]–[24].

In reality, professional architects still tend to use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects, but only in projects related to public policies such as urban planning, landscapes or open spaces, for example, those written by Bin Jiang (2021) [25], Bratteteig & Wagner (2014) [26] and others. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [27], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [28]–[30].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. Whereas in 1919 when the Bauhaus art school was inaugurated, its lecturers had already conducted collaborative programs when creating architectural products that were oriented towards modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the Bauhaus workshop they combine distinctive design competencies. Arts, crafts, architecture and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [31].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIAL AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day, researchers must understand the dynamics of the architect's profession from the architect's point of view [32], [33]. Perspectives as insiders and

Field Code Changed

Formatted: Not Highlight

Deleted: still

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: carried out

Deleted: fferent

Field Code Changed

Deleted: fferent

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

outsiders are ethnographic research methods built and constructed using emic and etic analogies [34].

To produce a research framework, data collection begins by observing the phenomena that occur related to the actions taken by architects when designing public toilets as part of their respective architectural project. After getting a rough idea from the architect community, the data sources were mapped based on groups, namely groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been camouflaged. Research schedule 1 April 2020 – 30 June 2021 in Gowa, South Sulawesi, Indonesia. The data validation and analysis use triangulasi test. The results were presented using the narrative method.

TABLE I

RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
Total Informants		98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs and interviews of students and lecturers were carried out in their final studios or in the rooms of the Department of Architecture related to their activities. Data were collected, mapped and analyzed using the cultural domain [35].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. But choosing the process required for the creation of an idea is often confusing

because it is difficult to determine which process can perform better than the other [36]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps, that is the analytical phase, creative phase and the executive phase of communication [22]. But whether these stages are really carried out by architects to create their creative works, still invites a question mark [37].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their own methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their project. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

Firza, a lecturer and senior architect, shared his experience when he got the legislative building project. He is required to present the draft before commission and plenary meetings. Discussions with members of the legislature were heated, because each member of the legislature had a different view of the draft that was considered representative of the legislative building. He made a draft concept proposal at the time of participating in the tender, but during the detailed engineering design (DED) process the concept was ignored. Project managers and members of the legislature only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. Firza was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In his final project studio, Efran, who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form is then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The function of the toilet is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle didn't seem compatible with his toilet room idea, he decided to cut the corners of the building's triangle (see Figure 1).

Bora, with the theme of the slide park project, focuses on dynamic forms that are rich in arches. The difference is, Bora

Field Code Changed
Field Code Changed
Formatted: Not Highlight
Field Code Changed
Field Code Changed

Deleted:
Deleted: changed
Formatted: Not Highlight
Formatted: Not Highlight
Deleted: time
Formatted: Not Highlight
Field Code Changed

Deleted: Number

Field Code Changed
Deleted: ... [1]
Deleted: . s

is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. He didn't want the shape of the building to be damaged because he had to follow the rectang

ular shapes commonly found in toilet designs (see Figure 2).

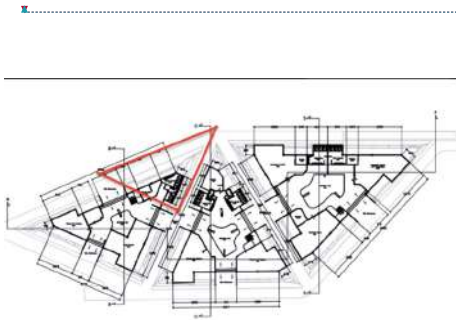
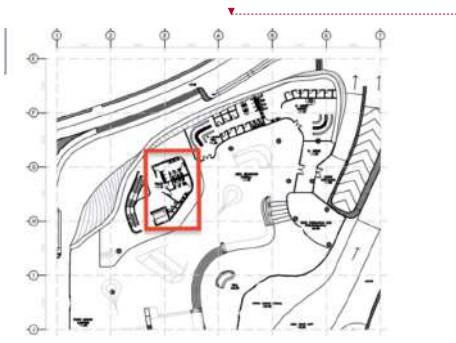


Fig. 1. Bora Project with the triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.

Source: Department of Architecture, Hasanuddin University



Source: Department of Architecture, Hasanuddin University

Efran and Bora consistently always connect the design concept with the resulting design. Synchronization of each completing the design stage is conducted with feedback to

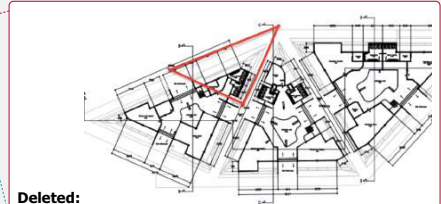
the previous stages. They created with the concept of function following the shape of the building. Starting the idea by processing the three-dimensional (3D) shape of the building. During the design process, they make different decisions. Efran chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, Bora always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike Efran and Bora with Design Methods where the design process is entirely conducted by the architect himself, Yayang with the topic of her final assignment for Student Housing Areas chose the Participatory Design process. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. Yayang invites residents and boarding students to formulate problems and objectives of regional design. They make the concept of service groups related to activities that occur in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes, but supporting facilities such as daily necessities stalls, food and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that can be accessed by their shop customers. It does not matter if the toilet is shared with the owner of the house. Yayang and the residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. (see Figure 3).

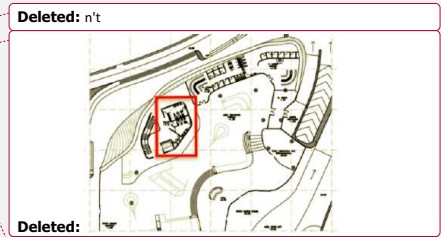
Deleted: are
Deleted: r

Deleted: s

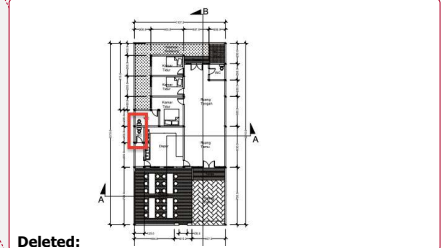


Deleted:
Formatted: Font: 12 pt
Formatted: Centered
Deleted: arried out
Formatted: Centered, Indent: First line: 0 cm

Deleted: .
Deleted: T



Deleted: n't
Deleted: s



Deleted:
Deleted: Fig. 2. The triangular corners of the building floor plan were cut to fit the standard rectangular shape of the public toilets floor plan.
Deleted: arried out

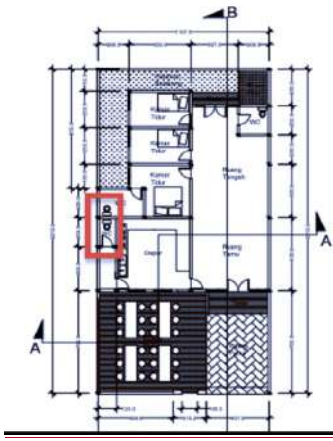


Fig. 3. The owner of the boarding house – café provides a simple public toilet for café customers.

Source: Department of Architecture, Hasanuddin University

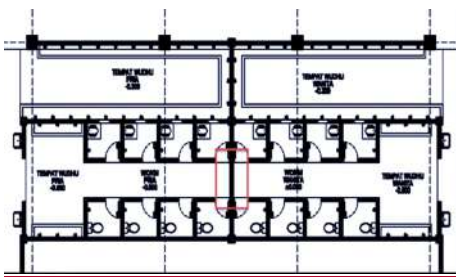


Fig. 4. Public toilets with a connecting door between the male and female toilet areas.

Source: Pillar Bangunindo

Ari's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, Ari always involves his clients before making decisions about the design concept of his building. Ari's team is worried that they will produce designs that are not in accordance with Islamic principles. In this case, the toilet is always a consideration not only in the separation of facilities between men and women as in other facilities, but also based on the meanings of Islamic buildings.

On Friday the mosque is only visited by men [38]. On that day the women's toilet was converted into a men's toilet. To support this function, a connecting door to the women's toilet area was made which was only opened when needed. When I asked if it was not thought that there was an opportunity for crimes against women that might occur with the connecting door, Ari stated that they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than normal days. (see Figure 4). Ari also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male users can squat in the closet while urinating.

Architect Dedi recounted that from the very beginning of designing the building, he was always thinking about where the toilets were placed and how it would affect other spaces. He did not want the existence of the toilet to cause problems when the project was built and maintained. In the government office design, Dedi has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a superior quality toilet.

Dedi's idea above turned out to be impossible when he was oversaw designing the renovation of the regent's office, he revealed to his client that the entire toilet area had to be dismantled and rebuilt on the grounds that the capacity and quality were no longer in line with current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. Dedi proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by Dedi because he thinks he has been entrusted to conduct his task of designing the facility.

In the restaurant project, Farhan's client wants the restaurant's public toilet to be as good as the one he usually uses when visiting public facilities abroad. He wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, Farhan increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. His client accepted the budget changes and was consistent with

Field Code Changed

Deleted: s

Deleted: .

Deleted: During the discussion, I suggested doing a simpler method, for example lowering the height of the urinal so that it can be used to urinate by squatting. Urinating in the urinal prevents urine from leaking due to the presence of a urinal wall. Ari is interested in the idea and will consider the mosque designs.

Formatted: Not Highlight

Deleted: . [2]

Deleted: good

Deleted: in charge of

Deleted: .

Deleted: arry not

Deleted: .

the principle that the availability of adequate public toilets is a prerequisite for an excellent restaurant.

The Design Methods that Efran and Bora used when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte, builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [39], [40]. The meaning of the design was constructed by the architect using universal standards. In a normative process, there is no opportunity for dialogue, whether the user's ideas are in line with the architect's ideas [41]. Ari, Dedi and Farhan put the interests and expectations of the client as the main thing in designing. They dialogue and construct together the meanings that will be generated in the design. However, Dedi's client did not play an active role in the design process. In contrast to Ari and Farhan, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process conducted by the architects above is very different from what Yayang did. Their project relates to public policies. Therefore, she involved stakeholders in this community and local leaders of their communities. She places the boarding community as the owner of meaning. Yayang as architects assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [42]. Citizens are involved since problems are explored and formulated, ideas are developed, until solutions are generated.

Yayang realizes that participation is at the core of Participatory Design where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect use her knowledge of expertise and users with knowledge of how to use them [43], [44]. In many cases, it is important for architects to develop and modify their methods in response to local contexts [45].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function but become a commodity of the financial system. It is possible that a building is not made for a social function, but for the circulation of money [46].

The toilet room has the most expensive price 2-3 times compared to the unit price per m2 compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include for ablation facility. Usually by reason of needing clean and dirty water networks [47], the facility is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For reasons of efficiency, the architects worked around this by reducing the number of toilets or placing ablation faucets in the toilet hall, the space where the sink and/or urinal are usually located.

Ridwan, a lecturer does not accept that for reasons of efficiency the ablation room (wudhu room) is placed in the toilet zone. For him, the toilet is a place to clean the body from dirt, while the ablation room is a place to clean the body from najis. Ablution is a process of cleansing the body of Muslims. Therefore, toileting and ablation activities are placed in adjacent zoning. D. P. Wright distinguishes between what is considered clean and holy, in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while dirt that is prohibited is considered najis which makes one's worship invalid. [48].

Dedi works in districts far from big cities and generally works on government project designs. He has been involved in the project since the budget was proposed. In practice, he always adapts his plans to changes in the budget that occur. When the proposed building design is made, He designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. Dedi had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although Farhan's client did not set a budget limit for toilets, Farhan reminded that the toilet material chosen was not only aesthetic considerations, but also safety concerns. If the proposed material endangers the user's safety, Farhan will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because Farhan considered it unsuitable for the needs of public toilets. Farhan explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

Deleted: good

Deleted: facilities

Deleted: for Muslims who are the largest community in Indonesia.

Deleted: ablation place is

Field Code Changed

Field Code Changed

Field Code Changed

Formatted: Font:Italic

Deleted: Wudhu

Formatted: Font:Italic

Formatted: Font:Italic

Deleted: carried out

Deleted: P

Formatted: Not Highlight

Deleted: Yayang

Formatted: Not Highlight

Formatted: Font:Italic

Field Code Changed

Field Code Changed

Formatted: Not Highlight

Field Code Changed

Field Code Changed

Deleted: relatively

Deleted: ,

Field Code Changed

Farhan also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate, but to urinate. The number of closet cubicles for women is maintained on the grounds that women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. In contrast to what some researchers have complained about the issue of lack of closet cubicles for women, not only in big cities in developing countries such as India and Indonesia, but also in America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [49]–[51]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [52], [53]. When planned, Dedi's client wanted to present his toilet as a self-actualization, human need at the top layer of Maslow's Theory pyramid. A sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. But when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. In contrast to Farhan's client, who was consistent from the beginning of the design to the implementation of the project.

Toilets are not considered as something of cultural value as described by Kluckhohn. Nor does the assumption [54] that utility makes something use-value. That a product's use-value is not related to the price of the product, but its utility. But according to Hegel, utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value, but also with a marginal value that is determined subjectively by the buyer [55]. From the very beginning architects worked not only to produce useful works, but also to expect their work to have a subjective aesthetic [56]. For Deleuze [57], subjectivity means an irreducible quality or power, which acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and conditioning subjective fields that are interrelated. The marginal price of this toilet was created by Farhan and his client to offer to the restaurant consumer community.

Like Dedi, Ari also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that Ari acts on behalf of the orientation of Islamic values, so that public toilets are placed as important spaces in

buildings and not just as service facilities. Bagi, Kluckhohn, value is something related to culture as a conception of the desired concept and plays a role in influencing the choice of action [58]. Value orientation is always unique and contextual and is owned by each community [59][60]. Ari's public toilet appears, distinguishes it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects talk about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design an architect must negotiate with the client. There are many differences between the competencies and professional practice, acquired during college, and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [32].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, budget execution, budget oversight, and budget reporting and accountability [61]. Absorption time is relatively limited between 3-6 months. For architects who have made proposals since the budget proposal was made, the working time can be considered sufficient, but not for those participating in the tender. They focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [62]. Consequently, all teaching and learning processes, including the final project studio, must also be conducted using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: to

Field Code Changed

Field Code Changed

Deleted: tell

Deleted: her

Deleted: Although Farhan also considers budget efficiency, he places the importance of restaurant public toilets as a form of self-actualization of his clients.

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

Deleted: arried out

though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

In consulting services, lecturers try to use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a total online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their own performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for the reason that face-to-face consultations are better because lecturers and students can easily and clearly discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system. Things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, Efran and Bora easily adapt. On the other hand, Putu et al who chose working hours, according to the offline culture before the pandemic had difficulty adjusting. A situation that Herbert Spencer had warned of in his theory of Survival of the Fittest in the 1800s and still holds true today.

In the final project studio, students work on their projects for nine months. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time, because all activities are carried out with a generalist approach using universal design standards. They have plenty of time to work without the need to involve stakeholders in decision making. If there are parties who are connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects as well as observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the quality of the materials used.

Yayang experienced the problem of time constraints, who from the beginning involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. In between the final project schedule, she must arrange a meeting schedule with the boarding community. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The increase in time is judged by the followers of Design Methods as something that turns out to be not balanced with the resulting performance. For example, for the results of a simple public toilet, it takes a long time and large energy compared to that produced by other Yayang colleagues. The important point here is to listen to their voices, they have limitations to participate because of very personal and sensitive reasons [63]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education, that is conducted with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [31]. The key point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In Participatory Design that representations of people and their activities are developed by them and with them [63]. In contrast to Design Methods

Deleted: Generally, architecture students are very familiar with digital technology and they are not hampered in using LMS applications. They take advantage of bold facility use situations to complete their projects on time. Young lecturers offer consultation through LMS all the time, they admit that consultation is very tiring. The intensity of consultation is also relatively high, causing the dynamics of student project design ideas to be fluid and can change at any time. -

Formatted: Not Highlight

Deleted: relatively

Deleted:

Deleted: relatively

Field Code Changed

Deleted: and Participatory Design. Design Methods

Deleted: arried out

Field Code Changed

Formatted: Not Highlight

Deleted: important

Formatted: Not Highlight

where the roles of the designer and user are defined from the start in the analysis phase. in Participatory Design the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that the talents and creative energy of many people can be productive and useful [64].

The approach that architects choose in the process of designing their projects uses Design Methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability. In contrast to architects who manage non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts with users as informants about what their expectations are regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process of toilets, it is found that it is related to budget availability, but not related to time availability. This happens in all processes that use Design Methods or those that involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget and time availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget and time are limited. However, for non-government projects / community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though with limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp.

- 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: McGraw-Heal Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.
- [11] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.
- [12] A. A. Bin Ruslan et al., "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.
- [14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.
- [15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.
- [16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.
- [17] J. C. Snyder, A. J. Catanese, and T. MacGintry,

Field Code Changed

Deleted: generally

Deleted: handle

Deleted: it is discussed when it is related to

Deleted: is

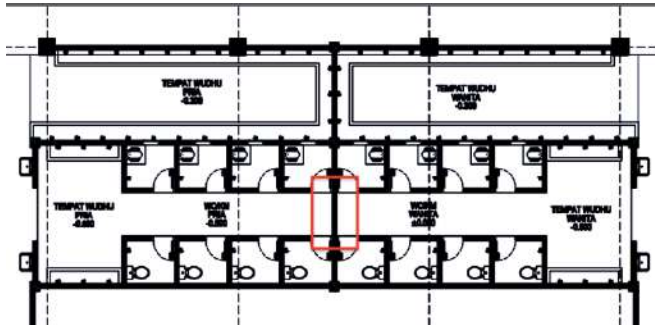
Deleted: the availability of a

Field Code Changed

Introduction to architecture. McGraw-Hill, 1979.

- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say*. In *Routledge International Handbook of Participatory Design* (J. Simonsen, & T. Robertson, Trans). New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: MIT Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [39] K. E. Howell, *An Introduction to the Philosophy of Methodology* SAGE Publication London. Los Angeles: Sage Publications, 2013.
- [40] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog*. EG Guba. London: Sage Publications, Inc, 1990.
- [41] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.
- [42] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.
- [43] T. Robertson and J. Simonsen, "Participatory Design: an

- introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.
- [44] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.
- [45] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [46] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.
- [47] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [48] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [49] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [50] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [51] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [52] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [53] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [54] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [55] G. W. F. Hegel, *Hegel: Elements of the philosophy of right*, Revised. Cambridge: Cambridge University Press, 2017.
- [56] R. Scruton, *The aesthetics of architecture*. Princeton: Princeton University Press, 2013.
- [57] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real*. Routledge, 2016.
- [58] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification*. Cambridge: Harvard University Press, 1951.
- [59] M. D. Hills, "Kluckhohn and Strodtbeck's values orientation theory," *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.
- [60] J. Robbins and J. Sommerschuh, "Values | Cambridge Encyclopedia of Anthropology," 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).
- [61] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." [Online]. Available: <http://djpb.kemenkeu.go.id/portal/id/layanan/kantor-pusat/pembinaan-pengelolaan-keuangan-blu/157-layanan/siklus-apbn.html>.
- [62] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR," *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [63] T. Robertson and I. Wagner, "Ethics: Engagement, representation and politics-in-action," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 84–105.
- [64] C. DiSalvo, A. Clement, and V. Pipek, "Communities: Participatory Design for, with and by communities," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 202–230.



Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo, Rahmi Amin Ishak, Syarif Beddu, Syavir Latif

Department of Architecture, Faculty of Engineering, Hasanuddin University, Gowa, 92172, Indonesia

*Corresponding author: triyatni@unhas.ac.id

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, it does not take special time to discuss them in the design process. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. In terms of public toilets, architects still use existing universal standards and have not involved users in producing public toilets according to their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects, and their clients. The research method with a qualitative approach uses a constructive paradigm. The data validation and analysis use the triangulation test. The results show that the architect's design process generally still uses the Design Methods approach, even though architects do not actually conduct the design phases as theorized by Design Methods.

Keywords— Public toilets, Design Methods, Participatory Design, architecture

Manuscript received October 15 2020; revised January 29 2021; accepted February 02 2021. Date of publication February 17 2021. IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In rich institutions whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of the architectural space, the toilet is not the main activity room but a service room. However, toilets have extraordinarily complex requirements to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3], the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a public toilet that meets the rational requirements but is also under local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on the design that is for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7], or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Jones [9] and Alexander [10] influenced the educational system and design practice. Since the 1960s, architecture students introduced this movement to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method was followed by famous architects [13]–[17].

Students solve architectural problems using project-based learning or case study methods in design classes. The same thing they do when working as an architect. Design methods using a rationalist and generalist approach aim to support

industry and mass products in the era of modern architecture [18]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The approach's focus is to design according to the physical environment's conditions and develop technology without involving users' participation and the local community's cultural meanings.

The design methods movement received a reaction from Rittel and Webber [19], who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because the common consensus in a homogeneous society can be defined, understood, and agreed upon. When society comprises diverse groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. The issues drive the need for argumentation methods in the design process [19], [20].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [21]. The architects then turned to the Cooperative Design (Co-Design) process method, better known as Participatory Design, were architects' partner with stakeholders and design according to local cultural meanings. They began to position the local community as the party that knew best what they needed. Users are considered to be the ones who have the most knowledge of what they practice and need, and the designer is the technical consultant who accompanies them. Therefore, their involvement is needed to produce a quality design [22]–[24].

In reality, professional architects still tend to use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects but only in projects related to public policies such as urban planning, landscapes, or open spaces [25], [26]. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [27], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [28]–[30].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. In 1919, when the Bauhaus art school was inaugurated, its lecturers had already conducted collaborative programs to create architectural products oriented toward modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the Bauhaus workshop, they combine distinctive design competencies. Arts, crafts, architecture, and technology experts worked together to build the *Gesamtkunstwerk*, a truly collaborative design work [31].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem-solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the

design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIALS AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day. Researchers must understand the dynamics of the architect's profession from the architect's point of view [32], [33]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [34].

Data collection begins by observing the phenomena related to architects' actions when designing public toilets as part of their respective architectural projects to produce a research framework. After getting a rough idea from the architect community, the data sources were mapped based on groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been camouflaged. Research schedule April 1, 2020 – June 30, 2021, in Gowa, South Sulawesi, Indonesia. The data validation and analysis use the triangulation test. The results were presented using the narrative method.

TABLE I
RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Informants	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs, and interviews of students and lecturers were carried out in their final studios or the rooms of the Department of Architecture related to their activities. Data were collected, mapped, and analyzed using the cultural domain [35].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. However, choosing the process required to create an idea is often confusing because it is difficult to determine which process can perform better than the other [36]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps: the analytical, creative, and executive phases of communication [22]. However, whether architects carry out these stages to create their creative works still invites a question mark [37].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their

methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their projects. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

FL, a lecturer and senior architect, shared his experience when he got the legislative building project. **FL** is required to present the draft before the commission and plenary meetings. Discussions with legislature members were heated because each legislature member had a different view of the draft that was considered representative of the legislative building. **FL** made a draft concept proposal when participating in the tender, but the concept was ignored during the detailed engineering design (DED) process. Project managers and legislature members only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. **FL** was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In final project studio, **EF** who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form has then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The toilet's function is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle seemed incompatible with his toilet room idea, **EF** decided to cut the corners of the building's triangle (see Figure 1).



Fig. 1. **RF** Project with the triangular corners of the building floor plan was cut to fit the standard rectangular shape of the public toilets floor plan. Source: Department of Architecture, Hasanuddin University [38].

With the theme of the slide park project, **BO** focuses on dynamic forms that are rich in arches. The difference is that **BO** is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. **FL** was reluctant for the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs (see Figure 2).

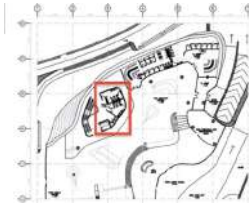
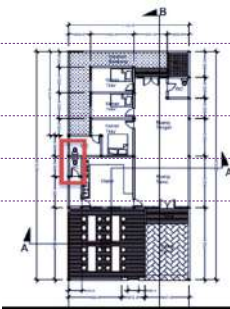


Fig. 2. **BO** Project adapts the shape of the toilet rooms to the curved shape of the building. Source: Department of Architecture, Hasanuddin University [38].

EF and **BO** consistently always connect the design concept with the resulting design. Synchronization of each completion of the design stage is conducted with feedback from the previous stages. **FA** and **BO** created with the concept of function following the shape of the building. Started the idea by processing the building's three-dimensional (3D) shape. During the design process, **EF** and **BO** make different decisions. **EF** chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, **BO** always adapts the shape of his toilet rooms to the curved shape of his building.

Unlike **EF** and **BO** with design methods, where the architect himself entirely conducts the design process, **YA** chose the Participatory Design process as the topic of her final assignment for Student Housing Areas. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. **YA** invites residents and boarding students to formulate problems and objectives of regional design. **YA** and residents make the concept of service groups related to activities in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes but supporting facilities such as daily necessities stalls, food, and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that their shop customers can access. It does not matter if the toilet is shared with the owner of the house. **YA** and the residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. (see Figure 3).



Deleted: Firza

Deleted: He

Deleted: The dynamics of toilet design.

Deleted: Efran and Bora

Deleted: He

Deleted: They

Deleted: They

Deleted: they

Deleted: Efran

Deleted: Firza

Deleted: Bora

Deleted: his

Deleted: Efran,

Deleted: Efran and Bora

Deleted: Yayang

Deleted: Yayang

Deleted: he

Deleted: They

Deleted: Yayang

Deleted: he

Deleted: They

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Deleted: Yayang

Fig. 3. The boarding house – café owner, provides a simple public toilet for café customers. Source: Department of Architecture, Hasanuddin University [39].

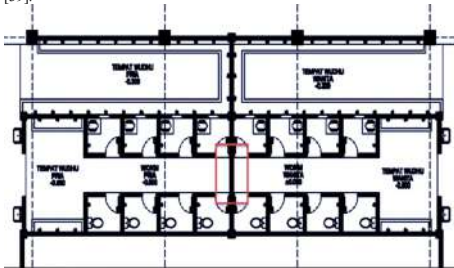


Fig. 4. Public toilets with a connecting door between the male and female toilet areas. Source: Pillar Bangunindo [40].

AR's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, AR always involves his clients before making decisions about the design concept of his building. AR's team is worried that they will produce designs that are not under Islamic principles. In this case, the toilet is always a consideration in the separation of facilities between men and women as in other facilities and based on the meanings of Islamic buildings.

On Friday, the mosque is only visited by men [41]. On that day the women's toilet was converted into a men's toilet. A connecting door to the women's toilet area was made to support this function, which was only opened when needed. When I asked if it was not thought there was an opportunity for crimes against women that might occur with the connecting door, AR stated they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than on normal days. (see Figure 4). AR also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male user can squat in the closet while urinating.

Architect DE recounted that from the beginning of designing the building, DE was always thinking about where the toilets were placed and how they would affect other spaces. DE did not want the toilet's existence to cause problems when the project was built and maintained. In the government office design, DE has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a superior quality toilet.

DE's idea above turned out to be impossible when he oversaw designing the renovation of the regent's office; he revealed to his client that the entire toilet area had to be dismantled and rebuilt because the capacity and quality were no longer in line with the current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. DE proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by DE because DE thinks he has been entrusted to conduct the task of designing the facility.

In the restaurant project, FA's client wants the restaurant's public toilet to be as good as the one FA usually uses when

visiting public facilities abroad. FA wanted to show that the appearance of the restaurant's public toilets represented the class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, FA increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. FA client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for an excellent restaurant.

EF and BO use design methods when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [42], [43]. The meaning of the design was constructed by the architect using universal standards. There is no opportunity for dialogue in a normative process; whether the user's ideas are in line with the architect's ideas [44]. AR, DE, and FH put the interests and expectations of the client as the main thing in designing. The dialogue and construct together with the meanings are generated in the design. However, DE's client did not play an active role in the design process. In contrast to AR and FA, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process conducted by the architects above is very different from what YA did. The architects project relates to public policies. Therefore, YA involved stakeholders in this community and local leaders of their communities. YA places the boarding community as the owner of meaning. YA as architects, assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [45]. Citizens are involved since problems are explored and formulated, and ideas are developed until solutions are generated.

YA realizes that participation is at the core of Participatory Design, where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect uses her knowledge of expertise and users with knowledge of how to use them [46], [47]. In many cases, architects need to develop and modify their methods in response to local contexts [48].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function but become a commodity of the financial system. It is possible that a building is not made for a social function but for the circulation of money [49].

The toilet room has the highest price 2-3 times the unit price per m2 compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include for ablution facility. Usually, by reason of needing clean and dirty water networks [50], the

- Deleted: He
- Deleted: Farhan
- Deleted: His
- Deleted: Efran and Bora's
- Deleted:
- Deleted: Ari
- Deleted: Ari
- Deleted: Ari
- Deleted: Dedi
- Deleted: Farhan
- Deleted: Ari
- Deleted: Dedi
- Deleted: Ari
- Deleted: Farhan
- Deleted: Yayang
- Deleted: ir
- Deleted: she
- Deleted: She
- Deleted: Ari
- Deleted: Yayang
- Deleted: Ari
- Deleted: Yayang
- Deleted: Dedi
- Deleted: Dedi
- Deleted: he
- Deleted: He
- Deleted: Dedi
- Deleted: Dedi
- Deleted: Dedi
- Deleted: he
- Deleted: Farhan
- Deleted: he

facility is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building. For efficiency reasons, the architects worked around this by reducing the number of toilets or placing abluion faucets in the toilet hall, the space where the sink and/or urinal are usually located.

RL, a lecturer, does not accept that the abluion room (wudhu room) is placed in the toilet zone for efficiency. For RL the toilet is a place to clean the body from dirt, while the abluion room is a place to clean the body from najis. Abluion is a process of cleansing the body of Muslims. Therefore, toileting and abluion activities are placed in adjacent zoning. Wright [51] distinguishes between what is considered clean and holy in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while prohibited dirt is considered as najis which makes one's worship invalid.

DE works in districts far from big cities and generally works on government project designs. DE has been involved in the project since the budget was proposed. In practice, DE always adapts his plans to changes in the budget that occur. When the proposed building design is made, DE designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. DE had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although FA's client did not set a budget limit for toilets, FA reminded that the toilet material chosen was aesthetic considerations and safety concerns. If the proposed material endangers the user's safety, FA will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because FA considered it unsuitable for the needs of public toilets. FA explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

FA also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate but to urinate. Women's number of closet cubicles is maintained because women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. Some researchers have complained about the lack of closet cubicles for women in big cities in developing countries such as India, Indonesia, and America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [52]-[54]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [55], [56]. When planned, DE's client wanted to present his toilet as self-actualization, human need at the top layer of Maslow's Theory pyramid. Sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. However, when the budget

allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. This is in contrast to FA's client, who was consistent from the beginning of the design to the implementation of the project.

Toilets are not considered something of cultural value, as described by Kluckhohn [57]. Nor does the assumption [58] that utility makes something use-value. That a product's use-value is not related to the product's price but its utility. However, according to Hegel, the utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value but also with a marginal value determined subjectively by the buyer [59]. From the very beginning, architects worked not only to produce useful works but also to expect their work to have a subjective aesthetic [60]. For Deleuze [61], subjectivity means an irreducible quality of power that acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and subjective conditioning-related fields. FA and his client created the marginal price of this toilet to offer to the restaurant consumer community.

Like DE, AR also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that AR acts on behalf of the orientation of Islamic values so that public toilets are placed as important spaces in buildings and not just as service facilities. Value is related to culture as a conception of the desired concept and plays a role in influencing the choice of action [57]. Value orientation is always unique and contextual and is owned by each community [62], [63]. AR's public toilet distinguishes it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects talk about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design, an architect must negotiate with the client. There are many differences between the competencies and professional practice acquired during college and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [32].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, execution, oversight, and reporting and accountability [64]. Absorption time is relatively limited between 3-6 months. The working time can be considered sufficient for architects who

Deleted: Farhan

Deleted: Ridwan

Deleted: him

Deleted: Dedi

Deleted: He

Deleted: he

Deleted: Farhan

Deleted: He

Deleted: Dedi

Deleted: Ari

Deleted: Ari

Deleted: Dedi

Deleted: Ari

Deleted: Farhan

Deleted: Farhan

Deleted: Farhan

Deleted: Farhan

Deleted: Farhan

Deleted: Farhan

Deleted: Dedi

have made proposals since the budget proposal was made but not for those participating in the tender. Architects, focus on working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [65]. Consequently, all teaching and learning processes, including the final project studio, must also be conducted using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

In consulting services, lecturers use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a totally online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for a reason, that face-to-face consultations are better because lecturers and students can easily discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues, and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations, and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system, things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, EF and BQ easily adapt. On the other hand, according to the offline culture before the pandemic, Putu et al., [66] who chose working hours, had difficulty adjusting. Spencer [67] warned of a situation in his theory of Survival of the Fittest in the 1800s that still holds today.

Students work on their projects for nine months in the final project studio. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete

projects on time because all activities are carried out with a generalist approach using universal design standards. Students, have plenty of time to work without the need to involve stakeholders in decision-making. If there are parties connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects and observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the materials' quality.

YA, experienced the problem of time constraints, which from the beginning, involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. YA must arrange a meeting schedule with the boarding community between the final project schedules. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The followers of Design Methods judge the increase in time as something that turns out to be not balanced with the resulting performance. For example, a simple public toilet results take a long time and large energy compared to that produced by other YA colleagues. The important point here is to listen to their voices. They have limitations to participating because of personal and sensitive reasons [68]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education, which is conducted with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [31]. The key point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In participatory design, people's representations and activities are developed by them and with them [68]. It is in contrast to design methods, where the roles of the designer and user are defined from the start in the analysis phase. In Participatory Design, the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that many people's talents and creative energy can be productive and useful [69].

The approach that architects choose in the process of designing their projects uses design methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability; it contrasts with architects who manage non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts, with users as informants about their expectations regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process.

Deleted: They

Deleted: They

Deleted: Yayang

Deleted: She

Deleted: Yayang

Deleted: Efran and Bora

Architects work based on their expertise, and users work based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process of toilets, it is found that it is related to budget availability but not time availability. This happens in all processes that use Design Methods or involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget and time availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget and time are limited. However, for non-government projects/community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though with a limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

[1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.

[2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.

[3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.

[4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.

[5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.

[6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.

[7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: McGraw-Hill Inc, 2007.

[8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.

[9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.

[10] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.

[11] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.

[12] A. A. Bin Ruslan et al., "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.

[13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.

[14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.

[15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.

[16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.

[17] J. C. Snyder, A. J. Catanese, and T. MacGinty, *Introduction to architecture*. McGraw-Hill, 1979.

[18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.

[19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.

[20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's

Dilemmas: Designerly Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.

[21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.

[22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.

[23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.

[24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.

[25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.

[26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.

[27] F. Kensing and J. Greenbaum, *Heritage: Having a Say. In Routledge International Handbook of Participatory Design (J. Simonsen, & T. Robertson, Trans)*. New York: Routledge, 2013.

[28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).

[29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).

[30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 2055668317725686, 2017.

[31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.

[32] D. Cuff, *Architecture: The story of practice*. Massachusetts: MIT Press, 1992.

[33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.

[34] T. Mostowiansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.

[35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.

[36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.

[37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.

[38] Department of Architecture Hasanuddin University, "Final Project." Department of Architecture, Makassar, 2021.

[39] Department of Architecture Hasanuddin University, *Final Project*. Makassar: Department of Architecture, 2009.

[40] Pillar Bangunindo, "Bangunindo. DED Islamic Center Sinjai." Bangunindo, Makassar, 2021.

[41] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.

[42] K. E. Howell, *An Introduction to the Philosophy of Methodology*. SAGE Publication London. Los Angeles: Sage Publications, 2013.

[43] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog. EG Guba*. London: Sage Publications, Inc, 1990.

[44] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.

[45] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.

[46] T. Robertson and J. Simonsen, "Participatory Design: an introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.

[47] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.

[48] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.

- [49] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.
- [50] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [51] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [52] Y. M. Reddy, S. Raghavan, and S. C. Vedala, "A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal," *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [53] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, "Women's perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study," *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [54] E. Ellisa and L. Luana, "Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women's perception of safety," *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [55] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [56] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [57] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification*. Cambridge: Harvard University Press, 1951.
- [58] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [59] G. W. F. Hegel, *Hegel: Elements of the philosophy of right*, Revised. Cambridge: Cambridge University Press, 2017.
- [60] R. Scruton, *The aesthetics of architecture*. Princeton: Princeton University Press, 2013.
- [61] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real*. Routledge, 2016.
- [62] M. D. Hills, "Kluckhohn and Strodtbeck's values orientation theory," *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.
- [63] J. Robbins and J. Sommerschuh, "Values | Cambridge Encyclopedia of Anthropology," 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).
- [64] Kementerian Keuangan RI, "Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI." .
- [65] Fajar, "Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR," *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [66] I. Putu, J. Tjakra, and F. P. Y. Sumanti, "Peran Konsultan Manajemen Konstruksi Pada Tahap Pelaksanaan (Studi Kasus: Proyek Pembangunan Rumah Sakit Jiwa Daerah Prof. VL Ratumbusyang)," *TEKNO*, vol. 20, no. 80, 2022.
- [67] H. Spencer, *The Scientific School: Herbert Spencer and After Spencer*, vol. 4. London: Taylor & Francis, 2000.
- [68] T. Robertson and I. Wagner, "Ethics: Engagement, representation and politics-in-action," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 84–105.
- [69] C. DiSalvo, A. Clement, and V. Pipck, "Communities: Participatory Design for, with and by communities," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 202–230.

Public Toilets Design Thinking in the Architecture Design Process

Triyatni Martosenjoyo^{a,*}, Rahmi Amin Ishak^a, Syarif Beddu^a, Syavir Latif^a

^a Department of Architecture, Faculty of Engineering, Hasanuddin University, Gowa, 92172, Indonesia

Corresponding author: *triyatni@unhas.ac.id

Abstract— Although architectural issues show awareness of the importance of good quality public toilets, it does not take special time to discuss them in the design process. Public toilets are considered by architects as something universal, although many facts show that public toilets are always contextual. To this day, the process of designing architectural education has resulted in architects using the Design Methods approach. Along with the paradigm shift in seeing reality, the Design Methods movement shifted to Participatory Design which considers it important for users to participate in the design process. In terms of public toilets, architects still use existing universal standards and have not involved users in producing public toilets according to their respective cultural meanings. This research aims to find out whether the change in the view of the design process approach from Design Methods to Participatory Design also occurs in the design process of public toilets. The research was conducted involving the participation of architectural education final project students, cross-city professional architects, and their clients. The research method with a qualitative approach uses a constructive paradigm. The data validation and analysis use the triangulation test. The results show that the architect's design process generally still uses the Design Methods approach, even though architects do not actually conduct the design phases as theorized by Design Methods.

Keywords— Public toilets; design methods; participatory design; architecture.

*Manuscript received 29 Aug. 2021; revised 17 Jan. 2022; accepted 22 Apr. 2022. Date of publication 30 Apr. 2022.
IJASEIT is licensed under a Creative Commons Attribution-Share Alike 4.0 International License.*



I. INTRODUCTION

Issues of poor toilet quality are always associated with low levels of education and poverty. Research at one of the major universities in Indonesia refutes this issue. In rich institutions whose citizens are highly educated, toilets are also still in poor condition [1]. In the composition of the architectural space, the toilet is not the main activity room but a service room. However, toilets have extraordinarily complex requirements to function optimally as a facility for the cleaning system for building users.

Architects solve toilet problems to produce toilets that are perceived as good. Public toilets, which were originally designed to be only a means to dispose of human body waste, have changed over time to adapt to the paradigm shifts that occur in society. Users with various awareness demand comfortable segregation between men and women [2], facilities for breastfeeding mothers [3], the needs of users with disabilities [4], to the need for an image of a place [5]. For a developing country like Indonesia, it is not easy to find a public toilet that meets the rational requirements but is also under local cultural meanings.

Although toilets are the product of the culture of the people themselves, public toilets are architectural products that are factually created through standards based on the design that is for Western society. Architects design public toilets following standard books such as Architectural Graphic Standards [6], Time-saver Standards for Building Types [7], or Architect Data [8]. Architects as experts use rationalist methods that solve problems with a generalist approach.

The Design Methods movement is a problem-solving approach that developed in the mid-20th century in response to industrialization and mass production. The movement pioneered by Jones [9] and Alexander [10] influenced the educational system and design practice. Since the 1960s, architecture students introduced this movement to solve problems formulated in project proposals. The architect's job is to be the one who best knows how to solve the problems their partners need [9]–[12]. This method was followed by famous architects [13]–[17].

Students solve architectural problems using project-based learning or case study methods in design classes. The same thing they do when working as an architect. Design methods using a rationalist and generalist approach aim to support

industry and mass products in the era of modern architecture [18]. Architects carry out their role as the party who knows best to solve the problems required by their clients. The approach's focus is to design according to the physical environment's conditions and develop technology without involving users' participation and the local community's cultural meanings.

The design methods movement received a reaction from Rittel and Webber [19], who considered that experts apply their knowledge to engineer solutions for society. This model can work effectively because the common consensus in a homogeneous society can be defined, understood, and agreed upon. When society comprises diverse groups, there can be no consensus on normativity. Each group has a different concept of value. In the 1960s the issue of pluralism and social unrest occurred in America. The issues drive the need for argumentation methods in the design process [19], [20].

Alexander and Jones left the rationalist paradigm when a new paradigm introduced by Thomas Kuhn in the 1970s was about how to see reality affects the world [21]. The architects then turned to the Cooperative Design (Co-Design) process method, better known as Participatory Design, where architects' partner with stakeholders and design according to local cultural meanings. They began to position the local community as the party that knew best what they needed. Users are considered to be the ones who have the most knowledge of what they practice and need, and the designer is the technical consultant who accompanies them. Therefore, their involvement is needed to produce a quality design [22]–[24].

In reality, professional architects still tend to use Design Methods theory books that have been abandoned by the architects who wrote them. Participatory design tends not to be carried out by architects in building planning projects but only in projects related to public policies such as urban planning, landscapes, or open spaces [25], [26]. Similar to the development of computer technology that encouraged the Participatory Design movement in Scandinavia [27], the progress of sanitary applications is also quite rapid, especially related to the environment, cleanliness, or user independence. Therefore, the design of toilets should also involve users so that they do not stutter in technology in the face of changing toilet culture [28]–[30].

In the practice of building design, there has not been a strong enough track record that produces design guidelines based on a contextual culture of partnership where an architectural product is located. In 1919, when the Bauhaus art school was inaugurated, its lecturers had already conducted collaborative programs to create architectural products oriented toward modern industry. Buildings and other artifacts must be designed to produce progressive social and cultural change. At the Bauhaus workshop, they combine distinctive design competencies. Arts, crafts, architecture, and technology experts worked together to build the Gesamtkunstwerk, a truly collaborative design work [31].

Regarding public toilets as cultural products, the question arises, how do architects respond to the change in the view of architects as problem solvers to the view that problem-solving is carried out jointly between architects and the community that owns the culture? Do they stick with the theory of the

design method movement, switch to participatory methods, or are there other methods outside of the two?

II. MATERIALS AND METHOD

This research was conducted using a qualitative approach based on a constructive paradigm that rewards communities for the right to interpret their respective cultures. To understand well the social world, interpretation, meaning, interaction, and quality in the process of action carried out by architects every day. Researchers must understand the dynamics of the architect's profession from the architect's point of view [32], [33]. Perspectives as insiders and outsiders are ethnographic research methods built and constructed using emic and etic analogies [34].

Data collection begins by observing the phenomena related to architects' actions when designing public toilets as part of their respective architectural projects to produce a research framework. After getting a rough idea from the architect community, the data sources were mapped based on groups of practitioner architects, students participating in the architectural design final project, clients, residents/users, and lecturers. See Table I. All informants' names have been camouflaged. Research schedule April 1, 2020 – June 30, 2021, in Gowa, South Sulawesi, Indonesia. The data validation and analysis use the triangulation test. The results were presented using the narrative method.

TABLE I
RESEARCH INFORMANTS

No.	Informants	Number
1	Practical Architects	18 people
2	Architectural Final Project Students	23 people
3	Client	14 people
4	Residents/Users	31 people
5	Lecturers	12 people
	Total Informants	98 people

Due to pandemic reasons, data collection of inter-city practitioner architect informants in Indonesia was carried out using the FGD method and in-depth interviews through teleconference and telephone media. Observations of the activities, FGDs, and interviews of students and lecturers were carried out in their final studios or the rooms of the Department of Architecture related to their activities. Data were collected, mapped, and analyzed using the cultural domain [35].

III. RESULT AND DISCUSSION

A. Design Thinking

Designing is the creation of an idea. However, choosing the process required to create an idea is often confusing because it is difficult to determine which process can perform better than the other [36]. Design Methods simplify the complexity of the steps carried out in systematic design into three-phase steps: the analytical, creative, and executive phases of communication [22]. However, whether architects carry out these stages to create their creative works still invites a question mark [37].

Although the design classes focus on the theories of Design Methods with the aim of design as a problem solution, students participating in the final project tend to develop their

methods without being disturbed by the theories that have been studied. When students enter the studio, they already have a written draft concept. Based on this concept, students draw their projects. This is different from what architects generally do when working in their respective studios. Architects independently make designs according to their respective interpretations of meaning. Design concepts are made by architects only for needs when they participate in design auctions.

FI, a lecturer and senior architect, shared his experience when he got the legislative building project. FI is required to present the draft before the commission and plenary meetings. Discussions with legislature members were heated because each legislature member had a different view of the draft that was considered representative of the legislative building. FI made a draft concept proposal when participating in the tender, but the concept was ignored during the detailed engineering design (DED) process. Project managers and legislature members only focus on the appearance of buildings and things that are visual in nature. In the consultation, public toilets were not discussed at all. FI was only asked to provide private toilets for legislative leaders. He designed public toilets using the standards in design manuals.

In final project studio, EF who is very good at sketching, started his design with the idea of dynamic shapes based on irregular triangles. This form has then functioned as a sculpture as a place of expression for street artists. The toilet was thought of after the complete form of the building was completed. The toilet's function is included in the empty building along with other spaces. The public toilets are mostly placed in triangular corners. When the pointed corners of the triangle seemed incompatible with his toilet room idea, EF decided to cut the corners of the building's triangle (see Figure 1).

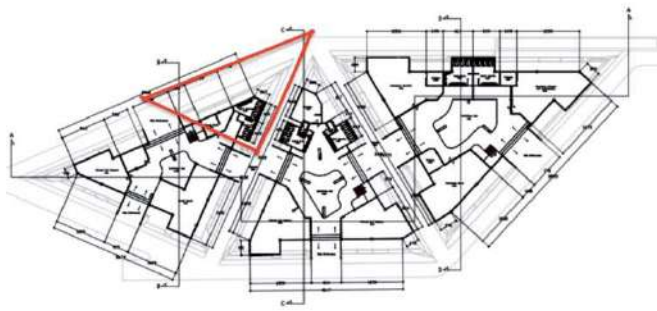


Fig. 1. RFProject with the triangular corners of the building floor plan was cut to fit the standard rectangular shape of the public toilets floor plan. Source: Department of Architecture, Hasanuddin University [38].

With the theme of the slide park project, BO focuses on dynamic forms that are rich in arches. The difference is that BO is consistent with his choice of building form. The entire design concept of the room, including the toilet, consistently follows the dynamics of the curved lines of the building. FI was reluctant for the shape of the building to be damaged because he had to follow the rectangular shapes commonly found in toilet designs (see Figure 2).

EF and BO consistently always connect the design concept with the resulting design. Synchronization of each completion of the design stage is conducted with feedback from the

previous stages. FA and BO created with the concept of function following the shape of the building. Started the idea by processing the building's three-dimensional (3D) shape. During the design process, EF and BO make different decisions. EF chose to prioritize the standard rectangular shape of the toilet rooms and sacrificed the basic triangular shape of the building. On the other hand, BO always adapts the shape of his toilet rooms to the curved shape of his building.

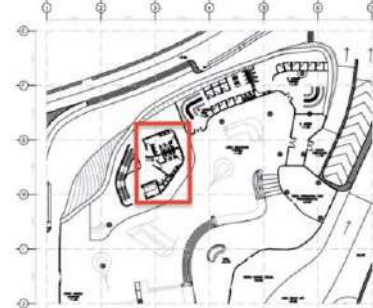


Fig. 2 BO Project adapts the shape of the toilet rooms to the curved shape of the building Source: Department of Architecture, Hasanuddin University [38].

Unlike EF and BO with design methods, where the architect himself entirely conducts the design process, YA chose the Participatory Design process as the topic of her final assignment for Student Housing Areas. Since submitting the proposal, she has involved residents of the area to be designed. They have dialogues and discuss the things that are the hopes of the architects and members of the community. YA invites residents and boarding students to formulate problems and objectives of regional design. YA and residents make the concept of service groups related to activities in the boarding area.

The joint decision resulted in homeowners being allowed to provide boarding rooms in their respective homes but supporting facilities such as daily necessities stalls, food, and drink stalls, and laundry will be placed according to the location of their homes. Houses that double as food and drink stalls are required to provide toilets that their shop customers can access. It does not matter if the toilet is shared with the owner of the house. YA and the residents made the layout of the area and the typical cottage according to the dimensions of the houses that the residents wanted. (see Figure 3).

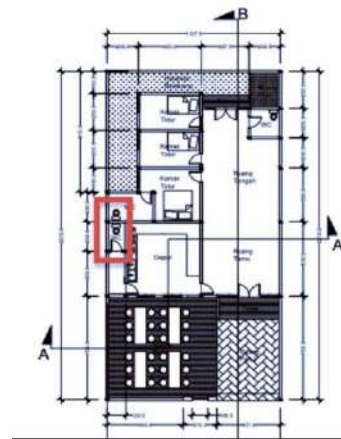


Fig. 3. The boarding house – cafe owner, provides a simple public toilet for café customers. Source: Department of Architecture, Hasanuddin University [39].

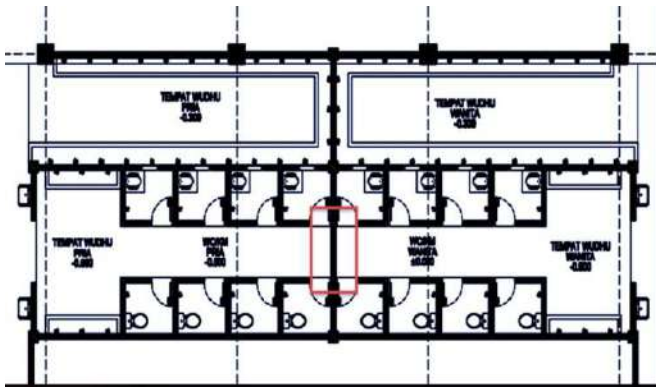


Fig. 4. Public toilets with a connecting door between the male and female toilet areas. Source: Pillar Bangunindo [40].

AR's team focuses on serving Islamic buildings such as mosques and Islamic Centers spread across various regencies in South Sulawesi. In the design process, AR always involves his clients before making decisions about the design concept of his building. AR's team is worried that they will produce designs that are not under Islamic principles. In this case, the toilet is always a consideration in the separation of facilities between men and women as in other facilities and based on the meanings of Islamic buildings.

On Friday, the mosque is only visited by men [41]. On that day the women's toilet was converted into a men's toilet. A connecting door to the women's toilet area was made to support this function, which was only opened when needed. When I asked if it was not thought there was an opportunity for crimes against women that might occur with the connecting door, AR stated they had not thought about it. They only consider that the number of male users who fill the mosque requires more toilets than on normal days. (see Figure 4). AR also explained that there was a client's desire to remove the urinal in the mosque's toilet hall and replace it with a cubicle closet. The hope is that male user can squat in the closet while urinating.

Architect DE recounted that from the beginning of designing the building, DE was always thinking about where the toilets were placed and how they would affect other spaces. DE did not want the toilet's existence to cause problems when the project was built and maintained. In the government office design, DE has already completed the concept of spatial relations before making the design drawings. The idea starts with making activity functions the focus of the design. He placed a toilet location that met all the conditions he hoped would produce a superior quality toilet.

DE's idea above turned out to be impossible when he oversaw designing the renovation of the regent's office; he revealed to his client that the entire toilet area had to be dismantled and rebuilt because the capacity and quality were no longer in line with the current needs. But he is tied to the location and dimensions of the toilet room that must be maintained. DE proposes to enlarge the dimensions at the expense of the existing workspace. The user accepts the concept offered by DE because DE thinks he has been entrusted to conduct the task of designing the facility.

In the restaurant project, FA's client wants the restaurant's public toilet to be as good as the one FA usually uses when visiting public facilities abroad. FA wanted to show that the appearance of the restaurant's public toilets represented the

class of his restaurant. The number and quality of toilets in the restaurant are adequate so that visitors do not have to queue when they want to go to the toilet. When the restaurant's capacity was increased from 700 to 1,000 diners, FA increased the toilet area from one area to three areas. The goal is to make toilets accessible from a distance that is not too far away. This change in the number of toilets directly increases the project budget. FA client accepted the budget changes and was consistent with the principle that the availability of adequate public toilets is a prerequisite for an excellent restaurant.

EF and BO use design methods when designing their project were entirely carried out with a positivistic approach. The paradigm developed by August Comte builds social science based on natural laws. Here meanings are neglected, and human behavior is measured like matter [42], [43]. The meaning of the design was constructed by the architect using universal standards. There is no opportunity for dialogue in a normative process, whether the user's ideas are in line with the architect's ideas [44]. AR, DE, and FH put the interests and expectations of the client as the main thing in designing. The dialogue and construct together with the meanings are generated in the design. However, DE's client did not play an active role in the design process. In contrast to AR and FA, who collaborate with their clients as active users. Their involvement is necessary, because they have the most interest in the design results.

The process conducted by the architects above is very different from what YA did. The architects project relates to public policies. Therefore, YA involved stakeholders in this community and local leaders of their communities. YA places the boarding community as the owner of meaning. YA as architects, assist them in constructing their own new meanings so that the resulting designs are compatible with their daily lives [45]. Citizens are involved since problems are explored and formulated, and ideas are developed until solutions are generated.

YA realizes that participation is at the core of Participatory Design, where residents are not only informants, but also participants in the design process. Participation demands recognition of user interests as a completely legitimate element of the design process. Here the architect and the user learn from each other. The architect uses her knowledge of expertise and users with knowledge of how to use them [46], [47]. In many cases, architects need to develop and modify their methods in response to local contexts [48].

B. Availability of Development Fund

Architectural projects are always associated with the availability of a large budget. Form follows finance occurs in architectural projects. Buildings are no longer seen for mere function but become a commodity of the financial system. It is possible that a building is not made for a social function but for the circulation of money [49].

The toilet room has the highest price 2-3 times the unit price per m² compared to other rooms. During the FGD with practicing architects, all agreed that the public toilets in Indonesia must include for ablution facility. Usually, by reason of needing clean and dirty water networks [50], the facility is placed in the zoning of the toilet room. The addition of this facility will obviously increase the price of the building.

For efficiency reasons, the architects worked around this by reducing the number of toilets or placing ablution faucets in the toilet hall, the space where the sink and/or urinal are usually located.

RI, a lecturer, does not accept that the ablution room (wudhu room) is placed in the toilet zone for efficiency. For RI, the toilet is a place to clean the body from dirt, while the ablution room is a place to clean the body from najis. Ablution is a process of cleansing the body of Muslims. Therefore, toileting and ablution activities are placed in adjacent zoning. Wright [51] distinguishes between what is considered clean and holy in terms of permissible and prohibited impurities. Impurities that are allowed to occur naturally, while prohibited dirt is considered as *najis* which makes one's worship invalid.

DE works in districts far from big cities and generally works on government project designs. DE has been involved in the project since the budget was proposed. In practice, DE always adapts his plans to changes in the budget that occur. When the proposed building design is made, DE designs according to the client's expectations, including their desire to make the appearance of the toilet as an imaging tool. The aesthetic quality of the toilet is expected to be equivalent to that of a five-star hotel. In its development, the proposed budget was not fully approved. DE had to revise the initial draft proposals made to match the available funds. One of the ways chosen is to reduce the aesthetic quality of the toilet. Finally, the design of the toilet is present like other simple toilets which are intended to fulfill the function of managing waste and no longer for imaging reasons through aesthetic quality.

Although FA's client did not set a budget limit for toilets, FA reminded that the toilet material chosen was aesthetic considerations and safety concerns. If the proposed material endangers the user's safety, FA will explain it to his client. For example, a high-priced cubicle door proposed by his client was rejected because FA considered it unsuitable for the needs of public toilets. FA explained that the cubicle door must float above the floor so that if there is a problem with the user, the manager can help the user quickly.

FA also reduced the number of male closet cubicles in standard books and replaced them with urinals. The reason is that only a few men go to public toilets to defecate but to urinate. Women's number of closet cubicles is maintained because women need more time in the toilet. There seems to be an increase in awareness of the need for a number of women's toilets. Some researchers have complained about the lack of closet cubicles for women in big cities in developing countries such as India, Indonesia, and America. The lack of toilet facilities for female users has forced them to hold their urine regularly. This condition has the potential to become a disease [52]–[54]

Architectural products are present as human needs in the layers of Maslow's pyramid according to the situation and conditions of the people [55], [56]. When planned, DE's client wanted to present his toilet as self-actualization, human need at the top layer of Maslow's Theory pyramid. Sizeable project funds will be devoted to the appearance of public toilets compared to other spaces. However, when the budget allocation changes not as much as expected, the need for self-actualization is sacrificed. The position of the public toilet

down to the bottom of the pyramid becomes a basic need for the function of cleaning the body and managing waste. This is in contrast to FA's client, who was consistent from the beginning of the design to the implementation of the project.

Toilets are not considered something of cultural value, as described by Kluckhohn [57]. Nor does the assumption [58] that utility makes something use-value. That a product's use-value is not related to the product's price but its utility. However, according to Hegel, the utility does not exist in a vacuum. The utility has a marginal exchange rate. Here public toilets appear not only for use-value but also with a marginal value determined subjectively by the buyer [59]. From the very beginning, architects worked not only to produce useful works but also to expect their work to have a subjective aesthetic [60]. For Deleuze [61], subjectivity means an irreducible quality of power that acts independently of a particular person. Architecture is not just making or designing, drawing or building, but creating, selecting, and subjective conditioning-related fields. FA and his client created the marginal price of this toilet to offer to the restaurant consumer community.

Like DEI, AR also did the same thing in getting a job as an architect of the Islamic Center building. What is different is that AR acts on behalf of the orientation of Islamic values so that public toilets are placed as important spaces in buildings and not just as service facilities. Value is related to culture as a conception of the desired concept and plays a role in influencing the choice of action [57]. Value orientation is always unique and contextual and is owned by each community [62], [63]. AR's public toilet distinguishes it from what is perceived as un-Islamic. Here, Islamic public toilets should not be placed at the bottom of Maslow's pyramid, namely self-actualization.

C. Limited Time

Designing is a creative process to generate creativity. A designer is a creative artist who is never satisfied with his designs. They always want to perfect their work. Therefore, the quality of the design is closely related to the duration of time the designer has at work. However, there are many stories that architects talk about the 'one night speed system' when they get an assignment. When digital technology develops, architects become easier and faster to work because they can use copy and paste techniques. Standard toilet templates with various capacities can simply be dragged into the resulting plans.

Cuff's research on three architectural firms and studios shows that the world of work in architects is a complex one. To interpret and finalize a design, an architect must negotiate with the client. There are many differences between the competencies and professional practice acquired during college and those determined by the architect's association. These differences are supported by the cultural context in which the architect is located [32].

Professional architects working on government projects are bound by a budget cycle that includes budget preparation, execution, oversight, and reporting and accountability [64]. Absorption time is relatively limited between 3-6 months. The working time can be considered sufficient for architects who have made proposals since the budget proposal was made but not for those participating in the tender. Architects focus on

working on the outline of the building and its functions and do not have time to linger working on the details of non-standard buildings, according to the local meaning for public toilets as desired in the participatory design.

When a pandemic outbreak appeared in Makassar in March 2020, the Work From Home (WFH) policy was implemented [65]. Consequently, all teaching and learning processes, including the final project studio, must also be conducted using the WFH system. The WFH schedule is changed periodically according to pandemic conditions. Even though the university has prepared Learning Management System (LMS) facilities, the situation with WFH's obligations and using the online learning process made lecturers and students panic.

In consulting services, lecturers use the LMS platform optimally because all document archiving systems for the learning process are stored properly. This is in line with the transition of the university administration system from a mixed offline-online system to a totally online system. Make it easier for them to report performance at the end of each semester. In an offline system, lecturers need time to enter their performance into the online management system.

Not all lecturers and students want to work using the LMS platform. Quite a number of people choose to continue to consult online by showing their designs in digital form or on drawing paper. For example, for a reason, that face-to-face consultations are better because lecturers and students can easily discuss the resolution of design problems. The downside is that consultations are limited to the WFH schedule. Initially, students and lecturers assumed that the pandemic would be quickly controlled, so they thought the consultation could be postponed for a while. When the pandemic continues, and the WFH schedule continues until 2021, the completion of student projects is also delayed and protracted.

The convenience of lecturer consulting services obtained by lecturers and students who use the LMS application cannot be separated from the concept of a constructive paradigm that benefits students and lecturers. The constructive paradigm places equal relations between two parties through transactions, negotiations, and collaborations. Through this relationship, efficiency and superior design quality are achieved. Students get an unlimited service, while lecturers get a well-recorded performance filing system, things that are difficult to dialogue in the offline learning process.

Both situations of using offline and online learning media indicate that changes in the culture of the communication system affect the work culture of architects. The online system demands student agility to use various learning media. When there is a change in learning culture, EF and BO easily adapt. On the other hand, according to the offline culture before the pandemic, Putu et al., [66] who chose working hours, had difficulty adjusting. Spencer [67] warned of a situation in his theory of Survival of the Fittest in the 1800s that still holds today.

Students work on their projects for nine months in the final project studio. The project starts making a proposal, going to the field to collect data, making concepts to designing. Design methods make it easier for them to control work and complete projects on time because all activities are carried out with a generalist approach using universal design standards.

Students have plenty of time to work without the need to involve stakeholders in decision-making. If there are parties connected with the design process, then it is only the supervisor related to the quality of the design and administrative staff for scheduling the periodic report schedule.

From FGDs with professional architects and observations of student work processes in the studio, it shows that time management is specifically connected with making concepts about toilets according to the local meanings of users. All architects agree that the toilet is important, but there is no need for a special time to discuss it. For them, improving the quality of toilet design is simply done by improving the materials' quality.

YA experienced the problem of time constraints, which from the beginning, involved community participation in formulating problems, creating ideas and concepts, and putting them into a design. YA must arrange a meeting schedule with the boarding community between the final project schedules. The schedule must be adjusted and not interfere with the daily routine tasks of residents. This makes the final project schedule prolonged. The followers of Design Methods judge the increase in time as something that turns out to be not balanced with the resulting performance. For example, a simple public toilet results take a long time and large energy compared to that produced by other YA colleagues. The important point here is to listen to their voices. They have limitations to participating because of personal and sensitive reasons [68]. In this case, there are limited funds to make public toilets that suit their needs.

In terms of participation, there is a clear difference in the purpose of the chosen method between the Design Methods commonly used in architectural education, which is conducted with a traditional approach serving users who buy architect designs according to what they offer. Participatory design is carried out with a critical approach where ideas and inspiration are challenged and not adopted or taken for granted by the community [31]. The key point here is that the ethical attitude of the design objectives is not related to the quality and value of the results. In participatory design, people's representations and activities are developed by them and with them [68]. It is in contrast to design methods, where the roles of the designer and user are defined from the start in the analysis phase. In Participatory Design, the roles of designer and user are mutually negotiable and tend to shift across different spaces. The goal is that many people's talents and creative energy can be productive and useful [69].

The approach that architects choose in the process of designing their projects uses design methods. Architects are still tasked with solving problems, especially those related to government projects. They only involve the client when the design is related to budget availability; it contrasts with architects who manage non-government projects. Here architects involve their clients in the design process. Architects position themselves as companion experts, with users as informants about their expectations regarding the designed facility. This is very different from what happened to architects who used the Participatory Design approach. Architects and users work together in the design process. Architects work based on their expertise, and users work

based on usage practices they know. Architects and users negotiate a good design according to their agreement.

IV. CONCLUSION

In the toilet design process of toilets, it is found that it is related to budget availability but not time availability. This happens in all processes that use Design Methods or involve user participation as informants. The shape of the design is influenced by the value orientation adopted by the client. In government projects, the value orientation may change according to budget and time availability. The value of a toilet designed as a self-actualization need can turn into a basic need for benefits only when the budget and time are limited. However, for non-government projects/community organizations, the availability of the budget does not affect the value orientation. The position of public toilets remains as a need for self-actualization even though with a limited budget. In Participatory Design, time can determine the form of the agreed design because the agreement may change over time.

REFERENCES

- [1] T. Martosenjoyo, H. Naping, M. R. Rahim, and M. Lampe, "Public Toilets, Stink and Power," *Asia Pacific J. Anthropol.*, vol. 21, no. 3, pp. 229–247, 2020.
- [2] C. Greed, "Join the queue: Including women's toilet needs in public space," *Sociol. Rev.*, vol. 67, no. 4, pp. 908–926, 2019.
- [3] X. Wang, J. Han, and E. Lichtfouse, "Unprotected mothers and infants breastfeeding in public amenities during the COVID-19 pandemic," *Environmental Chemistry Letters*. Springer, pp. 1–4, 2020.
- [4] N. R. Broyer, "Through the restroom mirror: accessibility and visibility in public space," *Disabil. Soc.*, vol. 35, no. 9, pp. 1483–1504, 2020.
- [5] K. W. Michael, "Better design quality of public toilets for visually impaired persons: an all-round concept in design for the promotion of health," *J. R. Soc. Promot. Health*, vol. 128, no. 6, pp. 313–319, 2008.
- [6] K. E. Hedges, *Architectural graphic standards*. John Wiley & Sons, 2017.
- [7] J. De Chiara and J. H. Callender, *Time saver standards for building types*. New York: Mcgraw-Heal Inc, 2007.
- [8] E. Neufert and Neufert, *Neufert Architects' Data*. Blackwell science ltd, 2012.
- [9] J. C. Jones, *Design methods*. John Wiley & Sons, 1992.
- [10] C. Alexander, *A pattern language: towns, buildings, construction*. Oxford university press, 2018.
- [11] W. M. Pena and S. A. Parshall, *Problem seeking: An architectural programming primer*. John Wiley & Sons, 2001.
- [12] A. A. Bin Ruslan et al., "A Value-Based Decision-Making Model for Selecting Sustainable Materials for Buildings," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 1–9, 2021, doi: 10.18517/ijaseit.11.6.14411.
- [13] J. A. LaGro Jr, *Site analysis: Informing context-sensitive and sustainable site planning and design*. John Wiley & Sons, 2013.
- [14] M. P. Sarkisian, "Fazlur Khan's legacy: towers of the future," *Struct. Infrastruct. Eng.*, vol. 12, no. 7, pp. 802–821, 2016.
- [15] F. D. K. Ching and J. F. Eckler, *Introduction to architecture*. John Wiley & Sons, 2012.
- [16] F. D. K. Ching, *Architecture: Form, space, and order*. John Wiley & Sons, 2014.
- [17] J. C. Snyder, A. J. Catanese, and T. MacGinty, *Introduction to architecture*. McGraw-Hill, 1979.
- [18] Y. Jiang, "The Similarities and Differences between Classical Architecture and Modern Architecture in Design Methods and Aesthetic Theories," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 267, no. 5, p. 52017.
- [19] H. W. J. Rittel and M. M. Webber, "Dilemmas in a general theory of planning," *Policy Sci.*, vol. 4, no. 2, pp. 155–169, 1973.
- [20] P. E. Vermaas and U. Pesch, "Revisiting Rittel and Webber's Dilemmas: Designarily Thinking Against the Background of New Societal Distrust," *She Ji J. Des. Econ. Innov.*, vol. 6, no. 4, pp. 530–545, 2020.
- [21] T. S. Kuhn and I. Hacking, "The Structure of Scientific Revolutions: 50th Anniversary Edition," *Chicago Univ.*, 2012.
- [22] J. C. Jones, *Designing designing*. Bloomsbury Publishing, 2021.
- [23] J. M. Greenbaum, *A design of one's own: towards participatory design in the United States*. New Jersey: L. Erlbaum Associates, 1993.
- [24] S. Grabow, *Christopher Alexander: The search for a new paradigm in architecture*. Routledge Kegan & Paul, 1983.
- [25] B. Jiang, "The Foxconn Factory Site, Methods, and Procedure for Design Interventions," in *Landscape Empowerment*, Springer, 2021, pp. 2–10.
- [26] T. Bratteteig and I. Wagner, *Disentangling participation: power and decision-making in participatory design*. Springer, 2014.
- [27] F. Kensing and J. Greenbaum, *Heritage: Having a Say. In Routledge International Handbook of Participatory Design (J. Simonsen, & T. Robertson, Trans)*. New York: Routledge, 2013.
- [28] A. Sealy, "How Japan's Music-playing, Water-spraying TOTO Toilets Took Over the World," *CNN*, 2018. <https://edition.cnn.com/style/article/toto-on-japan/index.html> (accessed Mar. 01, 2021).
- [29] The Conversation, "Toilets of the future must be designed with people in mind, not technology," 2018. <https://theconversation.com/toilets-of-the-future-must-be-designed-with-people-in-mind-not-technology-106610> (accessed Mar. 01, 2021).
- [30] D. Yachnin, G. Gharib, J. Jutai, and H. Finestone, "Technology-assisted toilets: Improving independence and hygiene in stroke rehabilitation," *J. Rehabil. Assist. Technol. Eng.*, vol. 4, p. 205568317725686, 2017.
- [31] L. J. Bannon and P. Ehn, "Design: design matters in Participatory Design," in *Routledge international handbook of participatory design*, Routledge, 2013, pp. 57–83.
- [32] D. Cuff, *Architecture: The story of practice*. Massachusetts: Mit Press, 1992.
- [33] L. N. Groat and D. Wang, *Architectural research methods*. John Wiley & Sons, 2013.
- [34] T. Mostowlansky and A. Rota, "Emic and etic," *The Cambridge Encyclopedia of Anthropology*, 2020. <https://www.anthroencyclopedia.com/entry/emic-and-etic>.
- [35] J. P. Spradley, *Participant observation*. Waveland Press, 2016.
- [36] G. Makstutis, *Design process in architecture: From concept to completion*. Laurence King, 2018.
- [37] M. Rezaei, *Reviewing Design Process Theories: Discourses in Architecture, Urban Design and Planning Theories*. Springer Nature, 2020.
- [38] Department of Architecture Hasanuddin University, "Final Project." Department of Architecture, Makassar, 2021.
- [39] Department of Architecture Hasanuddin University, *Final Project*. Makassar: Department of Architecture, 2009.
- [40] Pillar Bangunindo, "Bangunindo. DED Islamic Center Sinjai." Bangunindo, Makassar, 2021.
- [41] A. Sarwat and M. A. Lc, *Ensiklopedia Fikih Indonesia 3: Zakat*. Gramedia pustaka utama, 2019.
- [42] K. E. Howell, *An Introduction to the Philosophy of Methodology SAGE Publication London*. Los Angeles: Sage Publications, 2013.
- [43] E. G. Guba, *The alternative paradigm dialog. The paradigm dialog. EG Guba*. London: Sage Publications, Inc, 1990.
- [44] R. Luck, "Participatory design in architectural practice: Changing practices in future making in uncertain times," *Des. Stud.*, vol. 59, pp. 139–157, 2018.
- [45] R. C. Smith, C. Bossen, and A. M. Kanstrup, "Participatory design in an era of participation," *CoDesign*, vol. 13, no. 2. Taylor & Francis, pp. 65–69, 2017.
- [46] T. Robertson and J. Simonsen, "Participatory Design: an introduction," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 21–38.
- [47] E. Brandt, T. Binder, and E. B.-N. Sanders, "Tools and techniques: Ways to engage telling, making and enacting," in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 165–201.
- [48] A. Botero, S. Hyysalo, C. Kohtala, and J. Whalen, "Getting participatory design done: From methods and choices to translation work across constituent domains," *Int. J. Des.*, vol. 14, no. 2, p. 17, 2020.
- [49] T. Wainwright and G. Manville, "Financialization and the third sector: Innovation in social housing bond markets," *Environ. Plan. A*, vol. 49, no. 4, pp. 819–838, 2017.
- [50] C. E. R. Calderón, O. J. S. Parra, and S. C. V. Ayala, "Water Quality Prediction and Detection of the Vibrio Cholerae Bacteria," *Int. J. Adv.*

- Sci. Eng. Inf. Technol.*, vol. 11, no. 6, pp. 2369–2374, 2021, doi: <http://dx.doi.org/10.18517/ijaseit.11.6.13598>.
- [51] J. H. Neyrey, *Clean/Unclean, Pure/Polluted, and Holy/Profane: The Idea and System of Purity*. Peabody: Hendrickson Publisher Inc, 1996.
- [52] Y. M. Reddy, S. Raghavan, and S. C. Vedala, “A Narrative Exposition on Public Toilet Usage by Women: A Study from Warangal,” *Indian J. Gen. Stud.*, vol. 26, no. 1–2, pp. 108–137, 2019.
- [53] W. S. Reynolds, C. Kowalik, M. R. Kaufman, R. R. Dmochowski, and J. H. Fowke, “Women’s perceptions of public restrooms and the relationships with toileting behaviors and bladder symptoms: a cross-sectional study,” *J. Urol.*, vol. 204, no. 2, pp. 310–315, 2020.
- [54] E. Ellisa and L. Luana, “Female restrooms in the tourist destination: how the socio-spatial conditions of public toilets influence women’s perception of safety,” *J. Asian Archit. Build. Eng.*, no. just-accepted, 2021.
- [55] A. H. Maslow, *A theory of human motivation*. New Delhi: General Press, 2019.
- [56] M. van der Linden, *Architecture: Changing Spatial Transitions Between Context, Construction and Human Activities*. Singapore: Springer Nature Singapore Pte.Ltd, 2021.
- [57] C. Kluckhohn, *Values and value-orientations in the theory of action: An exploration in definition and classification*. Cambridge: Harvard University Press, 1951.
- [58] K. Marx, *Das Kapital Volume I*. Moscow: Progress Publishers, 1974.
- [59] G. W. F. Hegel, *Hegel: Elements of the philosophy of right*, Revised. Cambridge: Cambridge University Press, 2017.
- [60] R. Scruton, *The aesthetics of architecture*. Princeton: Princeton University Press, 2013.
- [61] S. Brott, *Architecture for a Free Subjectivity: Deleuze and Guattari at the Horizon of the Real*. Routledge, 2016.
- [62] M. D. Hills, “Kluckhohn and Strodtbeck’s values orientation theory,” *Online readings Psychol. Cult.*, vol. 4, no. 4, pp. 919–2307, 2002.
- [63] J. Robbins and J. Sommerschuh, “Values | Cambridge Encyclopedia of Anthropology.” 2016. <https://www.anthroencyclopedia.com/entry/gifts> (accessed Mar. 30, 2021).
- [64] Kementerian Keuangan RI, “Siklus APBN - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI.” .
- [65] Fajar, “Gubernur Sulsel Keluarkan Surat Edaran Penyesuaian Sistem Kerja ASN dalam Rangka pencegahan Covid-19 – FAJAR,” *FajarNews*, 2020. <https://fajar.co.id/2020/03/20/gubernur-sulsel-keluarkan-surat-edaran-penyesuaian-sistem-kerja-asn-dalam-rangka-pencegahan-covid-19/> (accessed Jun. 30, 2020).
- [66] I. Putu, J. Tjakra, and F. P. Y. Sumanti, “Peran Konsultan Manajemen Konstruksi Pada Tahap Pelaksanaan (Studi Kasus: Proyek Pembangunan Rumah Sakit Jiwa Daerah Prof. VL Ratumbusyang),” *TEKNO*, vol. 20, no. 80, 2022.
- [67] H. Spencer, *The Scientific School: Herbert Spencer and After Spencer*, vol. 4. London: Taylor & Francis, 2000.
- [68] T. Robertson and I. Wagner, “Ethics: Engagement, representation and politics-in-action,” in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 84–105.
- [69] C. DiSalvo, A. Clement, and V. Pipek, “Communities: Participatory Design for, with and by communities,” in *Routledge international handbook of participatory design*, Routledge, 2012, pp. 202–230.