

tourists can gain a deeper understanding of the local culture and contribute to preserving and promoting the local heritage.

Moreover, the core competencies of the local community play a crucial role in the sustainable tourism development in Tana Toraja. The community's carving, weaving, and music skills can be used to create unique and memorable tourism products and experiences. For example, the Toraja people's carving skills can create wooden souvenirs, such as masks, sculptures, and furniture, reflecting local culture and traditions. Similarly, the community's weaving skills can be used to create textiles, such as traditional fabrics and clothing, which are unique to the region. The community's musical performances can also be leveraged to create cultural events and festivals that attract tourists and promote the local heritage.

By showcasing these products and experiences, tourists can gain a deeper understanding of the local culture and contribute to preserving and promoting the local heritage. This, in turn, can create economic opportunities for the local community and contribute to sustainable tourism development in the region. Additionally, the community's involvement in the tourism industry can enhance their pride and ownership in their cultural heritage, leading to its preservation and transmission to future generations. One of the most important aspects of sustainable tourism development is the involvement of the local community in the tourism industry. By involving the local community in tourism, they can share their knowledge, skills, and cultural heritage with tourists, creating authentic and memorable experiences. This can also help to promote and preserve the local culture and traditions, which can be a source of pride and identity for the community.

When the local community is involved in tourism, it can also create economic opportunities for them. By showcasing their products and experiences, the local community can earn income from tourism activities. This can provide a sustainable source of income for the community and contribute to the region's overall economic development.

Moreover, the involvement of the local community in the tourism industry can enhance their sense of pride and ownership in their cultural heritage. When the community promotes and preserves its cultural heritage, it can help maintain and transmit it to future generations. This can ensure that the cultural heritage is not lost or forgotten and can contribute to the community's well-being. The involvement of the local community in the tourism industry can create employment opportunities and contribute to the region's economic development. The community can be involved in various aspects of tourism, such as tour guiding, handicraft production, and hospitality services. This can provide income for the community, help diversify the local economy, and reduce dependence on agriculture.

The involvement of the local community in the tourism industry can also promote cultural exchange and understanding between tourists and the local community. When tourists have the opportunity to interact with the local community, they can learn about their culture, traditions, and way of life. This can promote mutual respect and understanding and contribute to developing a more inclusive and tolerant society. However, it is important to ensure that the involvement of the local community in the tourism industry is sustainable and responsible. This means the

community should be involved in decision-making, and their cultural heritage should be respected and protected. Tourism should also be developed to minimize negative environmental and community impacts.

B. Discussion

Descriptions, explanations, and arguments regarding the basic values and orientation of socio-technical architectural values inherent in the visualization of images of Tongkonan traditional houses confirm the views of experts and the results of previous research [10], [31]. According to Rapoport [8], as quoted by Lehtinen [35], the broad meaning of the concept of architecture is understood as a space in which human life is more than just a physical dimension but also involves non-physical dimensions, including basic cultural institutions. This institution includes the rules of the social and cultural life of the people that are accommodated and simultaneously affect the visible architecture. In other words, architecture is tangible and intangible, technically and socio-culturally.

Based on this analysis, the local cultural values of the Toraja people, which are inherent in the image of the Tongkonan traditional house, can confirm the application of a phenomenological approach that reveals the noumena (meaning) behind the phenomena (empirical facts) under study. The results of the analysis, synthesis, and discussion of socio-technical architectural works of Tongkonan traditional houses also strengthen the assumptions of experts and researchers that there is architectural value creation for developing tourist attractions in the form of traditional Tongkonan houses. The Tongkonan model is loaded with basic values and orientations for the socio-cultural values of the Tana Toraja community, where currently the Tana Toraja traditional house is developed as a tourist attraction in two regencies, namely Tana Toraja Regency (the main regency) and North Toraja as a regency resulting from regional expansion.

The basic values and value orientations of changing local potentials into competencies of valuable tourism resources on a wider spectrum (regional, national, international) are realized through the development of one of its elements as a trigger for changes and improvements in the quality of other tourism components, namely attractions as a trigger for quality improvement, accommodation, accessibility to and from any tourism destination that provides Tongkonan traditional houses amenities and ancillaries. The integration and synergy of the five tourism components [31] are the foundation and pillar for the reconstruction of the Tongkonan traditional house, which represents a work of socio-technical architecture that is attractive for stakeholders and local governments as for visitors or tourists.

On the one hand, the development of the 5A tourism component with the attraction of the Tongkonan traditional house as a trigger through the re-actualization of the Sapta Pesona program, which includes the creation of security, order, cleanliness, beauty, coolness, and friendliness of the physical-social-psychological environment to provide memories for all (stakeholders, visitors, tourists) shows an integrated, synergistic and lasting dimension of socio-cultural architecture, as viewed by experts [1]–[4], [7], including the arrangement of objects of attraction. Tourism states how difficult it is nowadays to see the separation between the

technical and socio-cultural dimensions in architectural works encountered in Indonesia and throughout the world.

Then, on the other hand, the re-actualization of architectural works with shapes and variations of coloring patterns on Tongkonan shows the dimensions of technical architecture as a result of human creativity, taste, and initiative, which are also very valuable. In addition, it implies the meaning (noumena) behind the phenomenon (empirical facts) as the basic values and orientation of local cultural values developed by the community, as the expert view states that the interpretative-symbolic approach (symbolic anthropology) is a symbol or object, event, sound of speech, or physical or written forms that are given meaning by humans [28], [29], [36], [37]. Humans can give meaning to every event, action, or object related to thoughts, ideas, and emotions. In other words, when it is seen from the analogy of two sides of a rolling coin in the form of dimensions of social architecture on the one hand and dimensions of technical architecture on the other, it can confirm the accuracy of the authors' assumptions regarding integrated and synergistic socio-technical architecture based on traditional houses Tongkonan in Tana Toraja Indonesia.

IV. CONCLUSION

The architectural work of the Tongkonan traditional house is full of symbolic meaning as the crystallization of the basic values and orientation of the local cultural values of the Tana Toraja people. Tongkonan architecture also reflects the noumena (meaning) behind the socio-technical phenomena (facts) because the construction stands upright, supported by five pillars as a representation of the 5A (Attractions, Accessibility, Accommodation, Amenities, Ansilarities) of tourism, especially its attractions. The Tongkonan roof model, which at first glance looks like a person praying, is proof of the basic values and spiritual orientation of the Toraja people. The image of a rooster, the sun, and the arrangement of horns mounted on the Tongkonan wall prove the rich treasures of the local socio-cultural life of the local community. Judging from the analogy of two sides of a rolling coin, in the form of dimensions of social architecture on the one hand and dimensions of technical architecture on the other, an integrated and synergistic socio-technical architecture based on a community's traditional house is a zine-qua-non at the locus of development—tourism destinations in several regions around the world.

REFERENCES

- [1] F. Emery, "Characteristics of socio-technical systems," in *The Social Engagement of Social Science, a Tavistock Anthology, Volume 2*, University of Pennsylvania Press, 2016, pp. 157–186.
- [2] M. Sony and S. Naik, "Industry 4.0 integration with socio-technical systems theory: A systematic review and proposed theoretical model," *Technol. Soc.*, vol. 61, p. 101248, 2020.
- [3] A. S. Ekomadyo and A. Riyadi, "Design in Socio-technical Perspective: An Actor-Network Theory Reflection on Community Project 'Kampung Kreatif' in Bandung," *Arch. Des. Res.*, vol. 33, no. 2, pp. 19–36, 2020.
- [4] F. Dalpiaz, P. Giorgini, and J. Mylopoulos, "Adaptive socio-technical systems: a requirements-based approach," *Requir. Eng.*, vol. 18, no. 1, pp. 1–24, 2013.
- [5] E. G. Carayannis, F. A. F. Ferreira, P. Bento, J. J. M. Ferreira, M. S. Jalali, and B. M. Q. Fernandes, "Developing a socio-technical evaluation index for tourist destination competitiveness using cognitive mapping and MCDA," *Technol. Forecast. Soc. Change*, vol. 131, pp. 147–158, 2018.
- [6] X. Cao, A. Ali, A. H. Pitafi, A. N. Khan, and M. Waqas, "A socio-technical system approach to knowledge creation and team performance: evidence from China," *Inf. Technol. People*, 2020.
- [7] R. S. G. Estêvão, F. A. F. Ferreira, Á. A. Rosa, K. Govindan, and I. Meidutė-Kavaliauskienė, "A socio-technical approach to the assessment of sustainable tourism: Adding value with a comprehensive process-oriented framework," *J. Clean. Prod.*, vol. 236, p. 117487, 2019.
- [8] A. Rapoport, *The meaning of the built environment: A nonverbal communication approach*. University of Arizona Press, 1990.
- [9] G. Thabrani, "Arsitektur: Pengertian, Fungsi, Unsur & Tugas (Pendapat Ahli)." 2022.
- [10] R. R. Bare, H. Akib, D. H. Anshari, and A. Mukmin, "Competitive Advantage of Local Potential-Based Tourism Destinations: Evidence From Indonesia," *PalArch's J. Archaeol. Egypt/Egyptology*, vol. 17, no. 6, pp. 16567–16580, 2020.
- [11] R. T. Golembiewski, K. Billingsley, and S. Yeager, "Measuring change and persistence in human affairs: Types of change generated by OD designs," *J. Appl. Behav. Sci.*, vol. 12, no. 2, pp. 133–157, 1976.
- [12] N. Henry, *Public administration and public affairs*. Routledge, 2015.
- [13] X. Zhang et al., "Multiscale understanding and architecture design of high energy/power lithium-ion battery electrodes," *Adv. Energy Mater.*, vol. 11, no. 2, p. 2000808, 2021.
- [14] N. Malchow-Møller, J. R. Munch, and J. R. Skaksen, "Do foreign experts increase the productivity of domestic firms?," *Scand. J. Econ.*, vol. 121, no. 2, pp. 517–546, 2019.
- [15] E. I. Eyo, D. Sunarsi, H. Herling, N. Nurjaya, and A. Affandi, "A Literatur Review in Learning Organization," *Int. J. Educ. Adm. Manag. Leadersh.*, pp. 11–16, 2022.
- [16] S. H. Appelbaum, "Socio-technical systems theory: an intervention strategy for organizational development," *Manag. Decis.*, 1997.
- [17] G. Ropohl, "Philosophy of socio-technical systems," *Soc. Philos. Technol. Q. Electron. J.*, vol. 4, no. 3, pp. 186–194, 1999.
- [18] C. C. Manz and G. L. Stewart, "Attaining flexible stability by integrating total quality management and socio-technical systems theory," *Organ. Sci.*, vol. 8, no. 1, pp. 59–70, 1997.
- [19] A. Ali, T. Shabbir, and W. Ali, "A Literature Review on Public Leadership in Organizations," *Int. J. Educ. Adm. Manag. Leadersh.*, vol. 3, no. 1, pp. 1–10, 2022, doi: 10.51629/ijeamal.v3i1.75.
- [20] J. Gregory, "Scandinavian approaches to participatory design," *Int. J. Eng. Educ.*, vol. 19, no. 1, pp. 62–74, 2003.
- [21] B. Duraković, "PCMs in Building Structure," in *PCM-Based Building Envelope Systems: Innovative Energy Solutions for Passive Design*, Springer Nature, 2020, pp. 63–87.
- [22] B. Duraković, "PCM-Based Glazing Systems and Components," in *PCM-Based Building Envelope Systems: Innovative Energy Solutions for Passive Design*, Springer Nature, 2020, pp. 89–119.
- [23] A. H. Kljuno and M. Halilovic, "The phenomenon of ethno villages in Bosnian rural tourism," *Herit. Sustain. Dev.*, vol. 4, no. 2, pp. 122–133, 2022.
- [24] J. Kelly and D. Duerk, "Construction project briefing/architectural programming," *Best value Constr.*, pp. 38–58, 2002.
- [25] R. Gaha, B. Yannou, and A. Benamara, "A new eco-design approach on CAD systems," *Int. J. Precis. Eng. Manuf.*, vol. 15, no. 7, pp. 1443–1451, 2014.
- [26] J. Tao, L. Li, and S. Yu, "An innovative eco-design approach based on integration of LCA, CAD\ CAE and optimization tools, and its implementation perspectives," *J. Clean. Prod.*, vol. 187, pp. 839–851, 2018.
- [27] S. Reinbold, "Using the ADDIE model in designing library instruction," *Med. Ref. Serv. Q.*, vol. 32, no. 3, pp. 244–256, 2013.
- [28] M. J. Hatch, *Organization theory: Modern, symbolic, and postmodern perspectives*. Oxford university press, 2018.
- [29] L. Frey, "The Symbolic-Interpretive Perspective of Group Life.," 2005.
- [30] J. H. Wesseling, C. Bidmon, and R. Bohnsack, "Business model design spaces in socio-technical transitions: The case of electric driving in the Netherlands," *Technol. Forecast. Soc. Change*, vol. 154, p. 119950, 2020, doi: <https://doi.org/10.1016/j.techfore.2020.119950>.
- [31] R. R. Bare, "Pengembangan Destinasi Pariwisata Terintegrasi di Kabupaten Toraja Utara," Universitas Negeri Makassar, 2021.
- [32] P. Ma'na, A. Agustang, J. Salusu, A. Ikhsan, and G. D. Dirawan, "Decision making strategic value based local wisdom Tongkonan North Toraja," *Man India*, vol. 95, no. 3, pp. 633–639, 2015.

- [33] W. Rahayu, *Tongkonan: mahakarya arsitektur suku Toraja*. Badan Pengembangan dan Pembinaan Bahasa, 2017.
- [34] E. Tari, "Teologi Tongkonan: Berteologi Dalam Konteks Budaya Toraja," *Epigr. J. Teol. dan Pelayanan Kristiani*, vol. 2, no. 2, pp. 93–102, 2019.
- [35] S. Lehtinen, "Shifting Sensibilities: Architecture and the Aesthetics of the City," *Shifting Sensib. Archit. Aesthet. City*, pp. 89–105, 2020.
- [36] M. J. Hatch, "The dynamics of organizational culture," *Acad. Manag. Rev.*, vol. 18, no. 4, pp. 657–693, 1993.
- [37] Y. A. P. Lebang, "Analisis Semiotika Simbol Kekuasaan pada Rumah Adat Toraja (Tongkonan Layuk)," *eJournal Ilmu Komun.*, vol. 3, no. 4, pp. 158–172, 2015.