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Jurnal KORIDOR Journal homepage: https://talenta.usu.ac.id/koridor/ Study of Kurt Dietrich's Design Principles and Elements in Batak Karo Josephine Roosandriantini*1 , Josef Prijotomo2 1Darma Cendika Catholic University, Surabaya, 60117, Indonesia 2Parahyangan Catholic University, Bandung, Indonesia *Corresponding Author: jose.roo@ukdc.ac.id ARTICLE INFO Article history: Received 03 July 2024 Revised 13 September 2024 Accepted 28 June 2024 Available online 28 June 2024 E-ISSN: 2721-3463 P-ISSN: 2086-910X How to cite: Roosandriantini. J., and Prijotomo, J. (2024). Study of Kurt Dietrich's Design Principles and Elements in Batak Karo, Koridor Juournal, 15(1), 01-12. This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International. http://doi.org/10.32734/koridor.v15i1.12655 ABSTRACT Architectural design is the process to create a building that aims for the comfort and beauty of the building itself. An architect in creating or designing a building cannot be separated from the use of design principles in his design, in order to create aesthetics in his architectural works. This study aims to show that design elements and principles which are a European mindset can show that Indonesian architecture also has design principles such as modern, classic, and contemporary architecture. With this awareness in mind, research on Archipelago architecture should be carried out critically so that the European knowledge taken is the knowledge that has been able to conform with the Archipelago mindset, not with the European mindset. This research can be useful for providing knowledge or insight into proving a European design principle (mindset) that can also be applied to objects

of archipelago architecture. Explorative research method with a qualitative approach. European-minded design principles to recognize the existence of Batak Karo architecture. The analysis is carried out by ensuring that Kurt Dietrich's principles are based on the European mindset of the Karo Batak, which results in non-European design principles. The test was carried out to discuss whether there were design principles that applied to the Karo Batak, it was found that exclusive design principles were a unified archipelago design principle, and had the peculiarities of each architecture as well as diversity in archipelago architecture. Keyword: Batak Karo, Design Elements, Kurt Dietrich, Design Principles ABSTRAK Perancangan arsitektur merupakan suatu proses untuk mewujudkan suatu bangunan yang bertujuan untuk kenyamanan dan keindahan bangunan itu sendiri. Seorang arsitek dalam menciptakan atau merancang suatu bangunan tidak lepas dari penggunaan prinsip-prinsip desain dalam perancangannya, guna terciptanya estetika dalam karya arsitekturnya. Penelitian ini bertujuan untuk menunjukkan bahwa unsur dan prinsip desain yang merupakan pola pikir Eropa dapat menunjukkan bahwa arsitektur Indonesia juga memiliki prinsip desain seperti arsitektur modern, klasik, dan kontemporer. Dengan kesadaran tersebut, maka penelitian terhadap arsitektur nusantara hendaknya dilakukan secara kritis sehingga ilmu-ilmu Eropa yang diambil adalah ilmu-ilmu yang telah mampu menyesuaikan dengan pola pikir Nusantara, bukan dengan pola pikir Eropa. Penelitian ini dapat bermanfaat untuk memberikan pengetahuan atau wawasan untuk membuktikan prinsip desain (pola pikir) Eropa yang juga dapat diterapkan pada objek arsitektur nusantara. Metode penelitian eksploratif dengan pendekatan kualitatif. Prinsip desain berwawasan Eropa mengakui keberadaan arsitektur Batak Karo. Analisis dilakukan dengan memastikan bahwa prinsip Kurt Dietrich didasarkan pada pola pikir Eropa pada Batak Karo sehingga menghasilkan prinsip desain non-Eropa. Pengujian dilakukan untuk membahas apakah ada prinsip desain yang diterapkan pada Batak Karo, ditemukan prinsip desain eksklusif yang merupakan prinsip desain nusantara yang menyatu, dan mempunyai kekhasan masing-masing arsitektur serta keberagaman dalam arsitektur nusantara. Keyword: Batak Karo, Elemen Desain, Kurt Dietrich, Prinsip Desain 1. Introduction Architectural design is a process to create a building that aims for the comfort and beauty of the building itself, Architectural design is a complex combination of various processes, including site planning, form and massing, spatial layout, façade design, and building services (Sinha, 2020). An architect in creating or designing a building cannot be separated from the use of design principles in his design, in order to create aesthetics in his architectural works. According to modern architectural thinking, an architectural work must have a function or as a container for user activity, or there is a slogan from the following function. An architectural work cannot be separated from the play of a mass, form, or inner space, all of which unite in a design (Puja, Itenas, and Architecture 2014). . The integration of these factors is essential in creating a functional, habitable, and comfortable built environment (Uzunoglu & Quriesh, 2012). Form, mass, and space are related to the design principles commonly used in architectural design. Therefore, this research will understand the design principles used by an architect in constructing a building/architecture based on Kurt Dietrich.When discussing design principles, many studies use design principles as a discussion to review modern, classical, and other contemporary architectural objects. While this research uses the object of Batak Toba architecture (Siwaluh Jabu) and this study aims to show that design elements and principles are a European mindset can show that Archipelago architecture also has design principles as well as modern, classic, contemporary architecture, and others. This research can be useful for providing knowledge or insight into proving a European design principle (mindset) that can also be applied to objects of archipelago architecture. When talking about Archipelago architecture, it will be far from the term design concept with a European / Western way of thinking. But Archipelago

architecture is not just an appearance, but has local wisdom in terms of the environment, society, and culture of the local community. Archipelago architecture also applies the concepts of scale, human proportions, orientation, structure, and hierarchy on the vertical and horizontal axes (Winarni and Hamka 2019). When viewed from the physical form of the architecture of the archipelago also has a variety of roof forms, spatial arrangement, mass composition, as well as the game of scale and proportion in the height and width of the building which is very dominated by the roof, the physical form of Indonesian architecture and the design principles that guide it, with a particular emphasis on the influence of geometry, form, and space on the architectural expression (Apoorva Ajmera, 2020). The composition of shapes and masses, especially in Batak Karo architecture, forms a very aesthetically pleasing unitary form using design principles and elements. The composition of these forms can be arranged properly between unity, proportion, balance, rhythm, emphasis, and so on (Dahliani 2008). The composition of these forms can be well arranged between unity, proportion, balance, rhythm, emphasis, and so on. The composition of architectural forms in a building will reflect the functions contained in the building. This research can describe the design principles and elements that use an aesthetic design mindset in European and Archipelago architectural environments. 2. Method Exploratory research was carried out with a qualitative approach. The physical form of Indonesian architecture is a form of implementation of a design principle. Many European architectures are presented with European design principles(Ghonim & Eweda, 2019). This research aims to provide proof that Karo Batak architecture is also composed of several Kurt Dietrich design elements and principles, especially regarding the composition of mass, form, and space in Karo Batak architecture. This research also aims to provide a detailed explanation of the elements and principles of design using a European mindset to obtain general reasoning and conclusions that the physical form of Karo Batak architecture is composed of design elements and principles according to Kurt Dietrich. The analysis technique will be an initial literature study related to European design principles and the European mindset. The analysis was carried out by ensuring that Kurt Dietrich's design principles are fundamental to the European mindset. European Principles and Elements are used to find out which European design principles apply and do not apply in Karo Batak Architecture. Thus, the principles and elements of Karo Batak's architectural design can be presented. The following is a chart to illustrate the analysis technique carried out based on the principles and design elements of Kurt Dietrich, which is a European mindset, namely: Kurt Dietrich's Design Principles and Elements European Mindset European architecture Batak Karo Design Principles Batak Karo Mindset Not European design principles and elements Chart 1. Data analysis techniques Design principles and elements Source: Personal Analysis, 2023 3. Discussion 3.1. Understanding Design Elements and Design Principles The presence of a design element can be used to increase the architect's sensitivity towards handling a design, to be able to present the aesthetic value of each element that forms the design. These design elements can be space, shape, value, line, texture, color, and so on. Design does not only involve a design element, but also involves design principles for making changes to the design elements, namely balance, unity, emphasis, and so on (Yusita Kusumarini 2005). 3.2. Kurt Dietrich Design Elements and Principle An architectural design as a solution is a part-by-part arrangement of design principles. The design elements that must be present in an architectural work are color, line, shape, mass, space, and texture. Meanwhile, these design elements are composed using design principles such as balance, rhythm, scale, unity, emphasis, and proportion. Utilizing various design principles can be done by combining various principles and combining the properties of design elements so that they become a coherent and harmonious whole. No Elements 1 Color 2 3 4 Line Shape Space Table 1. Description of design elements according to Kurt

Dietrich Kurt Dietrich Design Elements The color element is an element that can emphasize the character of a building or component. Color also provides an opportunity to explain the psychological aspects that the architect will convey to the user. The line element is a basic element, that can determine shape, and volume and can create a sense of rhythm and flow in a particular form. Lines can also add emphasis to a design. The shape element is an element that talks about three-dimensional shapes (geometric, natural, abstract and non-objective shapes) The element of this space is that space is formed visually/imaginably which can give the impression of an open or closed space. Space can also be formed by the presence of shadows (negative and positive space). 3 No Elements 5 Texture Source: (Dietrich, n.d.) Kurt Dietrich Design Elements Texture elements are elements that can be felt visually and tactilely. Texture can be used to create the surface of a material even if it does not touch it directly. Table 2. The description of design principles according to Kurt Dietrich No Principle Kurt Dietrich Design Elements 1 Balance This design principle can be seen visually in unequal one-sided or equal weights. Balance can be divided into three, namely symmetrical balance, asymmetrical balance, and radial balance 2 Rhythm Design principles that suggest a rhythm and a tone are embedded in a design/architecture. This rhythm can be seen visually by the repetition of shapes, sizes, and textures in one building, such as a repeated rhythm. 3 Scale This design principle is closely related to proportion but is different from proportion because scale is more about talking about the size of the building on a standard scale for measuring human height. Scale can also provide an emotional effect or spatial impression. 4 Proportion This design principle relates to the ratio relationship between architectural design elements in a composition. It is more about comparing one object with another object or comparing parts of the main object. 5 Unity This design principle is a composition of each building component that becomes one and forms a harmonious whole. 6 Emphasis The design principle that emphasizes/emphasizes an object given its size, shape, pattern, color texture, and so on. So, be the focus of attention in that section. Source: (Dietrich, n.d.) Table 3. The description of the Design elements of Karo Batak Architecture Elemen Kurt Dietrich Batak Karo Architecture Color emphasizes the character Color to form a harmony, but with the presence of color can also form a of a building, showing striking contrast. Color can also give the impression of being hot or psychological aspects cold, and can also determine character and affect the human condition in terms of feelings and emotions (Dharsana 2019) Picture 1. Façade Siwaluh Jabu the combination of yellow, blue, white, reddish, and brown, which is located on the roof, and walls. The color presented as an "Emphasis" can be seen in the yellow color on the triangular roof, and brown fibers, The body of the building is yellow, then there are blue seams and white lines. The presence of the blue seam can be an emphasis on the color combination in the Karo Batak traditional house. Picture 2. Ornament at the entrance Source: Roosandriantini,2013 Placing decoration with the use of color at the temple entrance can be used as a way to emphasize creating visual interest. As in the picture above, colors can have meaning, namely white symbolizes the purity of the heart of the Karo people. Apart from that, color can also emphasize areas that people need to focus their attention on when they enter the house. Because there is wood protruding at the bottom of the entrance. Line determine shape, and volume and can create a sense of rhythm and flow within a given form. Lines can also add emphasis to a design. Picture 3. Long wood as an line center in the house https://laketoba.travel/siwaluh-jabu-melawan-waktu/ The front door to the back forms a continuous passage. There are long logs inside the house, forming line elements on the plan. Picture 4. Tungku dalam rumah Batak Karo https://laketoba.travel/siwaluh-jabu-melawan-waktu/ Siwaluh Jabu has 4 stoves, each stove is used for 2 families. There are no clear partitions or boundaries for the division of space, but indirectly there is an

imaginary line for dividing the space which is marked by the position of the furnace. There is a board in the middle that divides the 2 sides, which leads straight from the front door to the back. Picture 5. Line element position linier Halim, 2020 The line element is also described because the position of the furnace is parallel to the four points so that a line connects them, even though it is an apparent line. Shape three-dimensional shapes Regarding the shape elements of the Karo Batak house, it has 2 (geometric, natural, different views (transverse and longitudinal), depicting that there are 2 abstract and non-objective geometric shapes. The transverse view shows the shape of the roof in shapes) the form of a triangular geometry called lambe-lambe (Sitanggang, 1991) Picture 6. Elevation cross section "Siwaluh Jabu" https://docplayer.info/46759945-Elemen-pembentuk-arsitektur- tradisional-batak-karo-di-kampung-dokan .html A longitudinal view of a Karo Batak house shows a different geometric shape, namely two trapezoid shapes in different directions (opposite) (Adytia, Antariksa, and Ridjal 2017) Picture 7. Elevation cross section https://media.neliti.com/media/publications/115937-ID-elemen-pembentuk-arsitektur-tradisional.pdf Space gives the impression of an open or closed space. Space can also be formed by the presence of shadows (negative and positive space). Space is an illusion. A design principle is to present a flat image but can create a sense of space. In the picture below, you can see that there is only a wide and unfurnished room and there is a stove at 4 points. This can illusionally present a division of space even though there are no clear boundaries for each family. Gambar 8. The stove in the Siwaluh Jabu Architecture Roosandriantini, 2013 Gambar 9. The stove as an abstract space Roosandriantini, 2013 The space element in Figure 10 shows the height of the building, due to the height of the people in the room, with the top part there being an empty space which visually shows the building above the people making the space look very tall. Gambar 10. Spatial elements with human scale https://ichirositepu.tumblr.com/post/145216167121/rumah-adat-karo-gerga Spatial elements can also show the low side of the building, The Karo Batak room from the right image can be seen there are humans at the entrance (which are small in size) which can make the space feel small and low. Gambar 11. The size of entrance give impression low and small https://dailyvoyagers.com/blog/2018/01/03/siwaluh-jabu-rumah-adat-orang-karo/ Texture Elements that can be felt Texture can also affect how someone feels when they touch it, even just visually and tactilely, can visually. The quality of the texture can also be seen by the reflection of create the surface of a light, which hits the surface of the building material (Arifin and Raidi material even though they 2015). don't touch it directly. Texture refers to the surface quality of an object. Texture appeals to the sense of touch. Even when not actually feeling an object, memory will provide a sensory reaction or tactile sensation. Texture can enhance the effect of a design, arouse the desire to touch and feel the surface of a wall or floor, etc. Gambar 12. The roof texture https://kebudayaan.kemdikbud.go.id/bpcbaceh/arsitektur-tradisional-batak-karo-rumah-adat-karo-kabupaten-karoprovinsi-sumatera-utara/ Gambar 13. The roof texture https://www.gramedia.com/literasi/macam-rumah-adat-batak/ In pictures 12 and 13 visually it looks different based on the texture, in picture 12 the texture captured by our visuals, and indirectly by our touch gives the impression of being soft, and thick because of the moss that covers the siwaluh Jabu roof. Meanwhile, Figure 13 looks rougher and smoother. Table 4. Explanation of Design Principles for Karo Batak Architecture Prinsip Kurt Dietrich Batak Karo Architecture Balance Gives a biased / unbalanced The front and side views of the roof have the basic shape of a visual effect trapezoid and triangle (Adytia, P., Antariksa, A., & Ridjal, A. M. (2017). Visually, a symmetrical balance can be seen Gambar 14. Symetry balance https://batakpedia.org/asal-muasal-marga-karo/ Gambar 15. The balance appears along the length of the roof https://docplayer.info/46759945-Elemen-pembentuk-arsitektur-

tradisional-batak-karo-di-kampung-dokan.html Prinsip Kurt Dietrich Rhythm The shape, size, and texture of a building Repetition occurs such as rhythm/tone / tone intonation Rhythm occurs by repetition of structure (use of column spacing, size, and proportion), texture, color, and shape. This repetition can form a pattern of duplication or create visual movement. Gambar 16. Triangular section on the roof top https://artikel.rumah123.com/mengenal-8-fakta-menarik-rumah- adat-karo-yang-penuh-sejarah-dan-makna-79534 The roofs of Karo Batak architectural houses have a rhythm that forms a pattern/repetition of similar elements on the roof. The repetition is done on each side of the roof. Gambar17. Repetition / Rhythm of the roof "Siwaluh Jabu" https://indonesiatraveler.id/wp-content/uploads/2021/03/Batak- Desa-Lingga1.png The cross-sectional view of the Batak Karo house can form a rhythm in terms of elements: Massive wall - window - massive wall - entrance - massive wall - window - massive wall. Scales: Mi - re - mi - fa - mi - re - mi Gambar 18. Rhythm in façade house https://docplayer.info/73215794-Bab-1-arsitektur-tradisional- karo.html Gambar 19. Rooftop Rhythm https://www.prints-online.com/batak-architecture-sumatra- indonesia-14415583.html Prinsip Kurt Dietrich Scale Scale is more about talking about the size of a building using a standard scale for human height. The Jabu Siwaluh House has a very large building size and compared to the scale of human size, cars, and houses next to the building are very different, and this Jabu Siwaluh building can be an emphasis on the surrounding environment because of its size that attracts attention. Scale Gambar 20. Scale the house compared with human height https://www.pinterest.co.kr/pin/132434045262871462/ Gambar 21. Scale the house compared with the car Roosandriantini, Gita Junika (2019) Proportion ratio relationship between architectural design elements in a composition. More on the comparison between one object and another object Proportion is related to the dimensions of a shape, namely length, width, and height (Arifin and Raidi 2015). There is a staircase and an entrance to the house in the middle which is small so that people cannot enter immediately if they don't bow their heads and bodies. Likewise with the size of the windows in this traditional house. Proportion refers to the relationship of the sizes of elements in the overall composition of a building. Gambar 22. The proportion of the door size to the size of the building https://id.pinterest.com/pin/349873464781180763/ For the building itself, the lower area (under) the building and the middle room have more or less the same proportions. However, the roof of the building is too big so it seems less proportional and unbalanced for the body of the building. Gambar 23. Proportion on the roof https://id.pinterest.com/pin/62839357284790558/ Prinsip Kurt Dietrich Unity a composition of each building component that becomes one and forms a harmonious whole. Unity in the roof in the form of a continuous triangular shape (small, enlarged) and the use of the same roof covering material (color, texture) Gambar 24. Unity in element https://docplayer.info/73215794-Bab-1-arsitektur-tradisional- karo.html Emphasis give emphasis / focus on an object given the size, shape, pattern, color or texture, and so on. So, be the focus of attention in that section. The unique roof shape of the Karo Batak architecture which has a scale/size that is very different from the surrounding houses means that the Karo Batak traditional house can be said to be the emphasis of the appearance of Siwaluh Jabu. Gambar 25. Emphasis with the environment https://www.kibrispdr.org/rumah-adat-suku-karo.html Gambar 26. Focal point in environment https://laketoba.travel/siwaluh-jabu-melawan-waktu/ On the roof of "Sepulu Dua Jabu", there is a repetition of the shape of the ornament which emphasizes this building Gambar 27. The roof of "sepuluh dua jabu" https://id.pinterest.com/pin/632122497698402257/ Source: Personal Analysis, 2023 4. Conclussion According to Kurt Dietrich, design elements and principles that use a Western/European way of thinking, which is used to create an architectural work, can also be seen in the

Siwaluh Jabu building (Batak Karo traditional house). In Siwaluh Jabu, almost all of Kurt Dietrich's design elements and principles can be found applied to objects. The emphasis lies not only in the difference between the Siwaluh Jabu house and the surrounding houses but building elements such as the scale of the roof with the size of the human body, the size of the roof that is more dominant than the body of the building, the striking colors on the roof and the body of the building can be an emphasis on the Siwaluh building This jabu is the center of attention wherever it is. This study also concluded that although the Archipelago people did not understand the elements and principles of design in creating architecture, the physical form of Karo Batak architecture shows that it contains design elements and principles in a European/Western mindset. So, it can be said that Batak Karo architecture implements design elements and principles as a solution to producing architectural work. It can be seen from several aspects of its constituent elements, starting in terms of the shape of the building seen from the use of trapezoidal and triangular geometries. In terms of color, each color has a meaning, but color can also be used as an emphasis on the façade of a building, from a rhythm point of view, it can also be described as a repetition of each building element (windows, doors, and walls). Apart from that, it can also be seen that in terms of scale, it is also very striking in terms of the overall size of the Karo Batak buildings with the size of the human body, cars, and houses around it. 5. Acknowledgements (if any) Acknowledgments to Prof. Josef Prijotomo for guiding and providing input and being involved in research related to design principles in the Karo Batak. Thank you also to LPPM Parahyangan Catholic University for the opportunity to provide an internal grant to conduct this research. References Apoorva Ajmera. (2020). Role of Geometry on Architecture. International Journal of Engineering Research And, V9(06), 958–963. https://doi.org/10.17577/ijertv9is060733 Adytia, Putra, Antariksa Antariksa, and Abraham Mohammad Ridjal. 2017. "Elemen Pembentuk Arsitektur Tradisional Batak Karo Di Kampung Dokan." Jurnal Mahasiswa Jurusan Arsitektur Universitas Brawijaya. Arifin, Mufti, and Samsudin Raidi. 2015. "KARAKTERISTIK FASAD RUMAH MINIMALIS DI SURAKARTA." Sinektika: Jurnal Arsitektur. https://doi.org/10.23917/sinektika.v13i1.746. Dahliani. 2008. "STUDI PENERAPAN PRINSIP-PRINSIP DESAIN PADA MASJID NOOR BANJARMASIN." INFO TEKNIK, Volume 9 No. 1, Juli 2008. Dharsana, Wayan. 2019. "'Back to Nature': Sebuah Identitas Arsitektur-Interior Hotel The Ayu, Toyabungkah, Kintamani, Bali." JSRW (Jurnal Senirupa Warna). https://doi.org/10.36806/jsrw.v4i2.58. Dietrich, Kurt. n.d. "Architectural Design Elements." Architectural Curriculum Course Outline - Kurt Dietrich SK85ON23, 101. Dietrich, K. (n.d.). Architectural Design Elements. Architectural Curriculum Course Outline - Kurt Dietrich SK85ON23, 101. Ghonim, M., & Eweda, N. (2019). Instructors' perspectives on the pedagogy of architectural graduation projects: A qualitative study. Frontiers of Architectural Research, 8(3), 415–427. https://doi.org/10.1016/j.foar.2019.01.007 Sinha, A. (2020). Building Orientation as the Primary Design Consideration for Climate Responsive Architecture in Urban Areas. Architecture and Urban Planning, 16(1), 32–40. https://doi.org/10.2478/aup-2020-0006 Uzunoglu, S. S., & Quriesh, A. (2012). A Method of Adapting Construction Education in Architectural design Education. Procedia - Social and Behavioral Sciences, 51, 546–552. https://doi.org/10.1016/j.sbspro.2012.08.204 Puja, Galang, Kharisma Itenas, and Jurusan Arsitektur. 2014. "Prinsip Desain Arsitektur Keterkaitan Gubahan Massa Dan Pembentukan Ruang Dalam Pada Rumah Segitiga Di Bandung." Jurnal Reka Karsa. Winarni, Sri, and Hamka. 2019. "PENERAPAN UNSUR ARSITEKTUR NUSANTARA PADA KARYA DESAIN ARSITEK YU-SING." Pawon: Jurnal Arsitektur. https://doi.org/10.36040/pawon.v3i01.121. Yusita Kusumarini. 2005. "UNSUR DESAIN (Spesifik) DALAM PEMBELAJARAN DASAR DESAIN INTERIOR." Dimensi Interior. Augita, M. A, dkk. 2019. Penerapan Prinsip

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Study of Kurt Dietrich's Design Principles and Elements in Batak Karo

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ABSTRACT
Architectural design is the process to create a building that aims for the comfort and beauty of the building itself. An architect in creating or designing a building cannot be separated from the use of design principles in his design, in order to create aesthetics in his architectural works. This study aims to show that design elements and principles which are a European mindset can show that Indonesian architecture also has design principles such as modern, classic, and contemporary architecture. With this awareness in mind, research on Archipelago architecture should be carried out critically so that the European knowledge taken is the knowledge that has been able to conform with the Archipelago mindset, not with the European mindset. This research can be useful for providing knowledge or insight into proving a European design principle (mindset) that can also be applied to objects of archipelago architecture. Explorative research method with a qualitative approach. European-minded design principles to recognize the existence of Batak Karo architecture. The analysis is carried out by ensuring that Kurt Dietrich's principles are based on the European mindset of the Karo Batak, which results in non-European design principles. The test was carried out to discuss whether there were design principles that applied to the Karo Batak, it was found that exclusive design principles were a unified archipelago design principle, and had the peculiarities of each architecture as well as diversity in archipelago architecture.
Keyword: Batak Karo, Design Elements, Kurt Dietrich, Design Principles

ABSTRAK
Perancangan arsitektur merupakan suatu proses untuk mewujudkan suatu bangunan yang bertujuan untuk kenyamanan dan keindahan bangunan itu sendiri. Seorang arsitek dalam menciptakan atau merancang suatu bangunan tidak lepas dari penggunaan prinsip-prinsip desain dalam perancangannya, guna terciptanya estetika dalam karya arsitekturnya. Penelitian ini bertujuan untuk menunjukkan bahwa unsur dan prinsip desain yang merupakan pola pikir Eropa dapat menunjukkan bahwa arsitektur Indonesia juga memiliki prinsip desain seperti arsitektur modern, klasik, dan kontemporer. Dengan kesadaran tersebut, maka penelitian terhadap arsitektur nusantara hendaknya dilakukan secara kritis sehingga ilmu-ilmu Eropa yang diambil adalah ilmu-ilmu yang telah mampu menyesuaikan dengan pola pikir Nusantara, bukan dengan pola pikir Eropa. Penelitian ini dapat bermanfaat untuk memberikan pengetahuan atau wawasan untuk membuktikan prinsip desain (pola pikir) Eropa yang juga dapat diterapkan pada objek arsitektur nusantara. Metode penelitian eksploratif dengan pendekatan kualitatif. Prinsip desain berwawasan Eropa mengakui keberadaan arsitektur Batak Karo. Analisis dilakukan dengan memastikan bahwa prinsip Kurt Dietrich didasarkan pada pola pikir Eropa pada Batak Karo sehingga menghasilkan prinsip desain non-Eropa. Pengujian dilakukan untuk membahas apakah ada prinsip desain yang diterapkan pada Batak Karo, ditemukan prinsip desain eksklusif yang merupakan prinsip desain nusantara yang menyatu, dan mempunyai kekhasan masing-masing arsitektur serta keberagaman dalam arsitektur nusantara.
Keyword: Batak Karo, Elemen Desain, Kurt Dietrich, Prinsip Desain

1. Introduction

Architectural design is a process to create a building that aims for the comfort and beauty of the building itself, Architectural design is a complex combination of various processes, including site planning, form and massing, spatial layout, façade design, and building services (Sinha, 2020). An architect in creating or designing a building cannot be separated from the use of design principles in his design, in order to create aesthetics in his architectural works. According to modern architectural thinking, an architectural work must have a function or as a container for user activity, or there is a slogan from the following function. An architectural work cannot be separated from the play of a mass, form, or inner space, all of which unite in a design (Puja, Itenas, and Architecture 2014). . The integration of these factors is essential in creating a functional, habitable, and comfortable built environment (Uzunoglu & Quriesh, 2012). Form, mass, and space are related to the design principles commonly used in architectural design. Therefore, this research will understand the design principles used by an architect in constructing a building/architecture based on Kurt Dietrich.When discussing design principles, many studies use design principles as a discussion to review modern, classical, and other contemporary architectural objects. While this research uses the object of Batak Toba architecture (Siwaluh Jabu) and this study aims to show that design elements and principles are a European mindset can show that Archipelago architecture also has design principles as well as modern, classic, contemporary architecture, and others. This research can be useful for providing knowledge or insight into proving a European design principle (mindset) that can also be applied to objects of archipelago architecture.

When talking about Archipelago architecture, it will be far from the term design concept with a European / Western way of thinking. But Archipelago architecture is not just an appearance, but has local wisdom in terms of the environment, society, and culture of the local community. Archipelago architecture also applies the concepts of scale, human proportions, orientation, structure, and hierarchy on the vertical and horizontal axes (Winarni and Hamka 2019). When viewed from the physical form of the architecture of the archipelago also has a variety of roof forms, spatial arrangement, mass composition, as well as the game of scale and proportion in the height and width of the building which is very dominated by the roof, the physical form of Indonesian architecture and the design principles that guide it, with a particular emphasis on the influence of geometry, form, and space on the architectural expression (Apoorva Ajmera, 2020). The composition of shapes and masses, especially in Batak Karo architecture, forms a very aesthetically pleasing unitary form using design principles and elements. The composition of these forms can be arranged properly between unity, proportion, balance, rhythm, emphasis, and so on (Dahliani 2008).

The composition of these forms can be well arranged between unity, proportion, balance, rhythm, emphasis, and so on. The composition of architectural forms in a building will reflect the functions contained in the building. This research can describe the design principles and elements that use an aesthetic design mindset in European and Archipelago architectural environments.

2. Method

Exploratory research was carried out with a qualitative approach. The physical form of Indonesian architecture is a form of implementation of a design principle. Many European architectures are presented with European design principles(Ghonim & Eweda, 2019). This research aims to provide proof that Karo Batak architecture is also composed of several Kurt Dietrich design elements and principles, especially regarding the composition of mass, form, and space in Karo Batak architecture. This research also aims to provide a detailed explanation of the elements and principles of design using a European mindset to obtain general reasoning and conclusions that the physical form of Karo Batak architecture is composed of design elements and principles according to Kurt Dietrich. The analysis technique will be an initial literature study related to European design principles and the European mindset.

The analysis was carried out by ensuring that Kurt Dietrich's design principles are fundamental to the European mindset. European Principles and Elements are used to find out which European design principles apply and do not apply in Karo Batak Architecture. Thus, the principles and elements of Karo Batak's architectural design can be presented. The following is a chart to illustrate the analysis technique carried out based on the principles and design elements of Kurt Dietrich, which is a European mindset, namely:

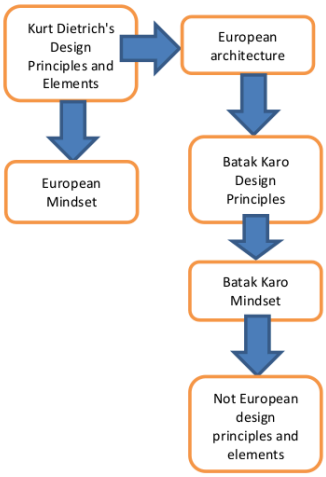


Chart 1. Data analysis techniques Design principles and elements
Source: Personal Analysis, 2023

3. Discussion

3.1. Understanding Design Elements and Design Principles

The presence of a design element can be used to increase the architect's sensitivity towards handling a design, to be able to present the aesthetic value of each element that forms the design. These design elements can be space, shape, value, line, texture, color, and so on. Design does not only involve a design element, but also involves design principles for making changes to the design elements, namely balance, unity, emphasis, and so on (Yusita Kusumarini 2005).

3.2. Kurt Dietrich Design Elements and Principle

An architectural design as a solution is a part-by-part arrangement of design principles. The design elements that must be present in an architectural work are color, line, shape, mass, space, and texture. Meanwhile, these design elements are composed using design principles such as balance, rhythm, scale, unity, emphasis, and proportion. Utilizing various design principles can be done by combining various principles and combining the properties of design elements so that they become a coherent and harmonious whole.

Table 1. Description of design elements according to Kurt Dietrich

No	Elements	Kurt Dietrich Design Elements
1	Color	The color element is an element that can emphasize the character of a building or component. Color also provides an opportunity to explain the psychological aspects that the architect will convey to the user.
2	Line	The line element is a basic element, that can determine shape, and volume and can create a sense of rhythm and flow in a particular form. Lines can also add emphasis to a design.
3	Shape	The shape element is an element that talks about three-dimensional shapes (geometric, natural, abstract and non-objective shapes)
4	Space	The element of this space is that space is formed visually/imaginably which can give the impression of an open or closed space. Space can also be formed by the presence of shadows (negative and positive space).

No	Elements	Kurt Dietrich Design Elements
5	Texture	Texture elements are elements that can be felt visually and tactilely. Texture can be used to create the surface of a material even if it does not touch it directly.

Source: (Dietrich, n.d.)

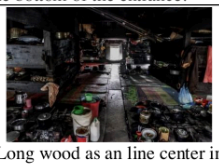
Table 2. The description of design principles according to Kurt Dietrich

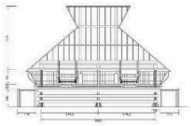
No	Principle	Kurt Dietrich Design Elements
1	Balance	This design principle can be seen visually in unequal one-sided or equal weights. Balance can be divided into three, namely symmetrical balance, asymmetrical balance, and radial balance
2	Rhythm	Design principles that suggest a rhythm and a tone are embedded in a design/architecture. This rhythm can be seen visually by the repetition of shapes, sizes, and textures in one building, such as a repeated rhythm.
3	Scale	This design principle is closely related to proportion but is different from proportion because scale is more about talking about the size of the building on a standard scale for measuring human height. Scale can also provide an emotional effect or spatial impression.
4	Proportion	This design principle relates to the ratio relationship between architectural design elements in a composition. It is more about comparing one object with another object or comparing parts of the main object.
5	Unity	This design principle is a composition of each building component that becomes one and forms a harmonious whole.
6	Emphasis	The design principle that emphasizes/emphasizes an object given its size, shape, pattern, color texture, and so on. So, be the focus of attention in that section.

Source: (Dietrich, n.d.)

Table 3. The description of the Design elements of Karo Batak Architecture

Elemen	Kurt Dietrich	Batak Karo Architecture
Color	emphasizes the character of a building, showing psychological aspects	Color to form a harmony, but with the presence of color can also form a striking contrast. Color can also give the impression of being hot or cold, and can also determine character and affect the human condition in terms of feelings and emotions (Dharsana 2019) Picture 1. Façade Siwaluh Jabu the combination of yellow, blue, white, reddish, and brown, which is located on the roof, and walls. The color presented as an "Emphasis" can be seen in the yellow color on the triangular roof, and brown fibers, The body of the building is yellow, then there are blue seams and white lines. The presence of the blue seam can be an emphasis on the color combination in the Karo Batak traditional house. Picture 2. Ornament at the entrance Source: Roosandriantini,2013

Elemen	Kurt Dietrich	Batak Karo Architecture
		Placing decoration with the use of color at the temple entrance can be used as a way to emphasize creating visual interest. As in the picture above, colors can have meaning, namely white symbolizes the purity of the heart of the Karo people. Apart from that, color can also emphasize areas that people need to focus their attention on when they enter the house. Because there is wood protruding at the bottom of the entrance.
Line	determine shape, and volume and can create a sense of rhythm and flow within a given form. Lines can also add emphasis to a design.	 Picture 3. Long wood as an line center in the house https://laketoba.travel/siwaluh-jabu-melawan-waktu/ The front door to the back forms a continuous passage. There are long logs inside the house, forming line elements on the plan. Picture 4. Tungku dalam rumah Batak Karo https://laketoba.travel/siwaluh-jabu-melawan-waktu/ Siwaluh Jabu has 4 stoves, each stove is used for 2 families. There are no clear partitions or boundaries for the division of space, but indirectly there is an imaginary line for dividing the space which is marked by the position of the furnace. There is a board in the middle that divides the 2 sides, which leads straight from the front door to the back. Picture 5. Line element position linier Halim, 2020
		The line element is also described because the position of the furnace is parallel to the four points so that a line connects them, even though it is an apparent line.

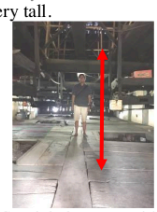
Elemen	Kurt Dietrich	Batak Karo Architecture
Shape	three-dimensional shapes (geometric, natural, abstract and non-objective shapes)	Regarding the shape elements of the Karo Batak house, it has 2 different views (transverse and longitudinal), depicting that there are 2 geometric shapes. The transverse view shows the shape of the roof in the form of a triangular geometry called lambe-lambe (Sitanggang, 1991) Picture 6. Elevation cross section "Siwaluh Jabu" https://docplayer.info/46759945-Elemen-pembentuk-arsitektur-tradisional-batak-karo-di-kampung-dokan.html A longitudinal view of a Karo Batak house shows a different geometric shape, namely two trapezoid shapes in different directions (opposite) (Adytia, Antariksa, and Ridjal 2017)  Picture 7. Elevation cross section https://media.neliti.com/media/publications/115937-ID-elemen-pembentuk-arsitektur-tradisional.pdf
Space	gives the impression of an open or closed space. Space can also be formed by the presence of shadows (negative and positive space).	Space is an illusion. A design principle is to present a flat image but can create a sense of space. In the picture below, you can see that there is only a wide and unfurnished room and there is a stove at 4 points. This can illusionally present a division of space even though there are no clear boundaries for each family.

Elemen	Kurt Dietrich	Batak Karo Architecture

Gambar 8. The stove in the Siwaluh Jabu Architecture
Roosandriantini, 2013

Gambar 9. The stove as an abstract space
Roosandriantini, 2013

The space element in Figure 10 shows the height of the building, due to the height of the people in the room, with the top part there being an empty space which visually shows the building above the people making the space look very tall.



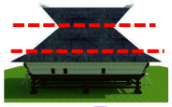
Gambar 10. Spatial elements with human scale
https://ichirositepu.tumblr.com/post/145216167121/rumah-adat-karo-gerga

Spatial elements can also show the low side of the building, The Karo Batak room from the right image can be seen there are humans at the entrance (which are small in size) which can make the space feel small and low.

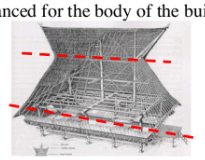
Gambar 11. The size of entrance give impression low and small
https://dailyvoyagers.com/blog/2018/01/03/siwaluh-jabu-rumah-adat-orang-karo/

Elemen	Kurt Dietrich	Batak Karo Architecture
Texture	Elements that can be felt visually and tactilely, can create the surface of a material even though they don't touch it directly.	Texture can also affect how someone feels when they touch it, even just visually. The quality of the texture can also be seen by the reflection of light, which hits the surface of the building material (Arifin and Raidi 2015). Texture refers to the surface quality of an object. Texture appeals to the sense of touch. Even when not actually feeling an object, memory will provide a sensory reaction or tactile sensation. Texture can enhance the effect of a design, arouse the desire to touch and feel the surface of a wall or floor, etc. Gambar 12. The roof texture https://kebudayaan.kemdikbud.go.id/bpcbaceh/arsitektur-tradisional-batak-karo-rumah-adat-karo-kabupaten-karoprovinsi-sumatera-utara/ Gambar 13. The roof texture https://www.gramedia.com/literasi/macam-rumah-adat-batak/
		In pictures 12 and 13 visually it looks different based on the texture, in picture 12 the texture captured by our visuals, and indirectly by our touch gives the impression of being soft, and thick because of the moss that covers the siwaluh Jabu roof. Meanwhile, Figure 13 looks rougher and smoother.

Table 4. Explanation of Design Principles for Karo Batak Architecture

Prinsip	Kurt Dietrich	Batak Karo Architecture
Balance	Gives a biased / unbalanced visual effect	The front and side views of the roof have the basic shape of a trapezoid and triangle (Adytia, P., Antariksa, A., & Ridjal, A. M. (2017). Visually, a symmetrical balance can be seen Gambar 14. Symetry balance https://batakpedia.org/asal-muasal-marga-karo/  Gambar 15. The balance appears along the length of the roof https://docplayer.info/46759945-Elemen-pembentuk-arsitektur-tradisional-batak-karo-di-kampung-dokan.html

Prinsip	Kurt Dietrich	Batak Karo Architecture
Rhythm	The shape, size, and texture of a building Repetition occurs such as rhythm/tone / tone intonation	Rhythm occurs by repetition of structure (use of column spacing, size, and proportion), texture, color, and shape. This repetition can form a pattern of duplication or create visual movement. Gambar 16. Triangular section on the roof top https://artikel.rumah123.com/mengenal-8-fakta-menarik-rumah-adat-karo-yang-penuh-sejarah-dan-makna-79534
		The roofs of Karo Batak architectural houses have a rhythm that forms a pattern/repetition of similar elements on the roof. The repetition is done on each side of the roof. Gambar17. Repetition / Rhythm of the roof "Siwaluh Jabu" https://indonesiatraveler.id/wp-content/uploads/2021/03/Batak-Desa-Lingga1.png The cross-sectional view of the Batak Karo house can form a rhythm in terms of elements: Massive wall - window - massive wall - entrance - massive wall - window - massive wall. Scales: Mi - re - mi - fa - mi - re - mi Gambar 18. Rhythm in façade house https://docplayer.info/73215794-Bab-1-arsitektur-tradisional-karo.html Gambar 19. Rooftop Rhythm https://www.prints-online.com/batak-architecture-sumatra-indonesia-14415583.html

Prinsip	Kurt Dietrich	Batak Karo Architecture
Scale	Scale is more about talking about the size of a building using a standard scale for human height.	The Jabu Siwaluh House has a very large building size and compared to the scale of human size, cars, and houses next to the building are very different, and this Jabu Siwaluh building can be an emphasis on the surrounding environment because of its size that attracts attention.
Scale		 Gambar 20. Scale the house compared with human height https://www.pinterest.co.kr/pin/132434045262871462/ Gambar 21. Scale the house compared with the car Roosandriantini, Gita Junika (2019)
Proportion	ratio relationship between architectural design elements in a composition. More on the comparison between one object and another object	Proportion is related to the dimensions of a shape, namely length, width, and height (Arifin and Raidi 2015). There is a staircase and an entrance to the house in the middle which is small so that people cannot enter immediately if they don't bow their heads and bodies. Likewise with the size of the windows in this traditional house. Proportion refers to the relationship of the sizes of elements in the overall composition of a building. Gambar 22. The proportion of the door size to the size of the building https://id.pinterest.com/pin/349873464781180763/
		For the building itself, the lower area (under) the building and the middle room have more or less the same proportions. However, the roof of the building is too big so it seems less proportional and unbalanced for the body of the building.  Gambar 23. Proportion on the roof https://id.pinterest.com/pin/62839357284790558/

Prinsip	Kurt Dietrich	Batak Karo Architecture
Unity	a composition of each building component that becomes one and forms a harmonious whole.	Unity in the roof in the form of a continuous triangular shape (small, enlarged) and the use of the same roof covering material (color, texture) Gambar 24. Unity in element https://docplayer.info/73215794-Bab-1-arsitektur-tradisional-karo.html
Emphasis	give emphasis / focus on an object given the size, shape, pattern, color or texture, and so on. So, be the focus of attention in that section.	The unique roof shape of the Karo Batak architecture which has a scale/size that is very different from the surrounding houses means that the Karo Batak traditional house can be said to be the emphasis of the appearance of Siwaluh Jabu. Gambar 25. Emphasis with the environment https://www.kibrispdr.org/rumah-adat-suku-karo.html Gambar 26. *Focal point in environment* https://laketoba.travel/siwaluh-jabu-melawan-waktu/
		On the roof of "Sepulu Dua Jabu", there is a repetition of the shape of the ornament which emphasizes this building Gambar 27. The roof of "sepuluh dua jabu" https://id.pinterest.com/pin/632122497698402257/

Source: Personal Analysis, 2023

4. Conclusion

According to Kurt Dietrich, design elements and principles that use a Western/European way of thinking, which is used to create an architectural work, can also be seen in the Siwaluh Jabu building (Batak Karo traditional house). In Siwaluh Jabu, almost all of Kurt Dietrich's design elements and principles can be found applied to objects. The emphasis lies not only in the difference between the Siwaluh Jabu house and the surrounding houses but building elements such as the scale of the roof with the size of the human body, the size of the roof that is more dominant than the body of the building, the striking colors on the roof and the body of the building can be an emphasis on the Siwaluh building This jabu is the center of attention wherever it is.

This study also concluded that although the Archipelago people did not understand the elements and principles of design in creating architecture, the physical form of Karo Batak architecture shows that it

contains design elements and principles in a European/Western mindset. So, it can be said that Batak Karo architecture implements design elements and principles as a solution to producing architectural work.

It can be seen from several aspects of its constituent elements, starting in terms of the shape of the building seen from the use of trapezoidal and triangular geometries. In terms of color, each color has a meaning, but color can also be used as an emphasis on the façade of a building, from a rhythm point of view, it can also be described as a repetition of each building element (windows, doors, and walls). Apart from that, it can also be seen that in terms of scale, it is also very striking in terms of the overall size of the Karo Batak buildings with the size of the human body, cars, and houses around it.

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