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ARTIKEL JURNAL

Judul Artikel : GOING MINIMAL: AN EXPLORATION OF REDUCTION AS A DESIGN METHOD

Jurnal : Jurnal ARSNET Prodi Arsitektur Universitas Indonesia Depok

Volume 1, Nomor 2 Tahun 2021

Penulis : Bramasta Putra Redyantanu

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1	Bukti Submit Artikel	01 September 2021
2	Bukti Review Ronde 1	21 September 2021
3	Bukti Review Ronde 2	07 Oktober 2021
4	Bukti Penerimaan Paper	14 Oktober 2021
5	Bukti Konfirmasi Draft Paper	21 Oktober 2021
6	Bukti Publikasi Artikel	31 Oktober 2021

01 BUKTI SUBMIT ARTIKEL 01 SEPTEMBER 2021

[ARSNET] Submission Acknowledgement External Inbox ×

Kristanti Dewi Paramita <arsnet@ui.ac.id> Sep 1, 2021, 3:50 PM
to me

Bramasta Putra Redyantanu:

Thank you for submitting the manuscript, "UNDERSTANDING MINIMALIST ARCHITECTURE : BEYOND VISUAL LANGUAGE: UNDERSTANDING MINIMALIST ARCHITECTURE : BEYOND VISUAL LANGUAGE" to ARSNET. 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:

Submission URL: https://architecture.ui.ac.id/arsnet/index.php/ojs/authorDashboard/submission/15
Username: bramasta

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Kristanti Dewi Paramita

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02 BUKTI REVISI RONDE 1 21 SEPTEMBER 2021

[ARSNET] Editor Decision External Inbox ×

Kristanti Dewi Paramita <kristanti.dewi@ui.ac.id> Tue, Sep 21, 2021, 10:26 AM
to me

Dear Bramasta Putra Redyantanu,

We have reached a decision regarding your submission to ARSNET, "UNDERSTANDING MINIMALIST ARCHITECTURE : BEYOND VISUAL LANGUAGE: UNDERSTANDING MINIMALIST ARCHITECTURE : BEYOND VISUAL LANGUAGE".

Our decision is: Revisions Required

Please refer to the reviewers' comments at the end of this email and revise your manuscript accordingly. Please upload your revision before 5 October 2021.

Thank you for your contribution to ARSNET and we look forward to receiving your revised manuscript.

Reviewer A:

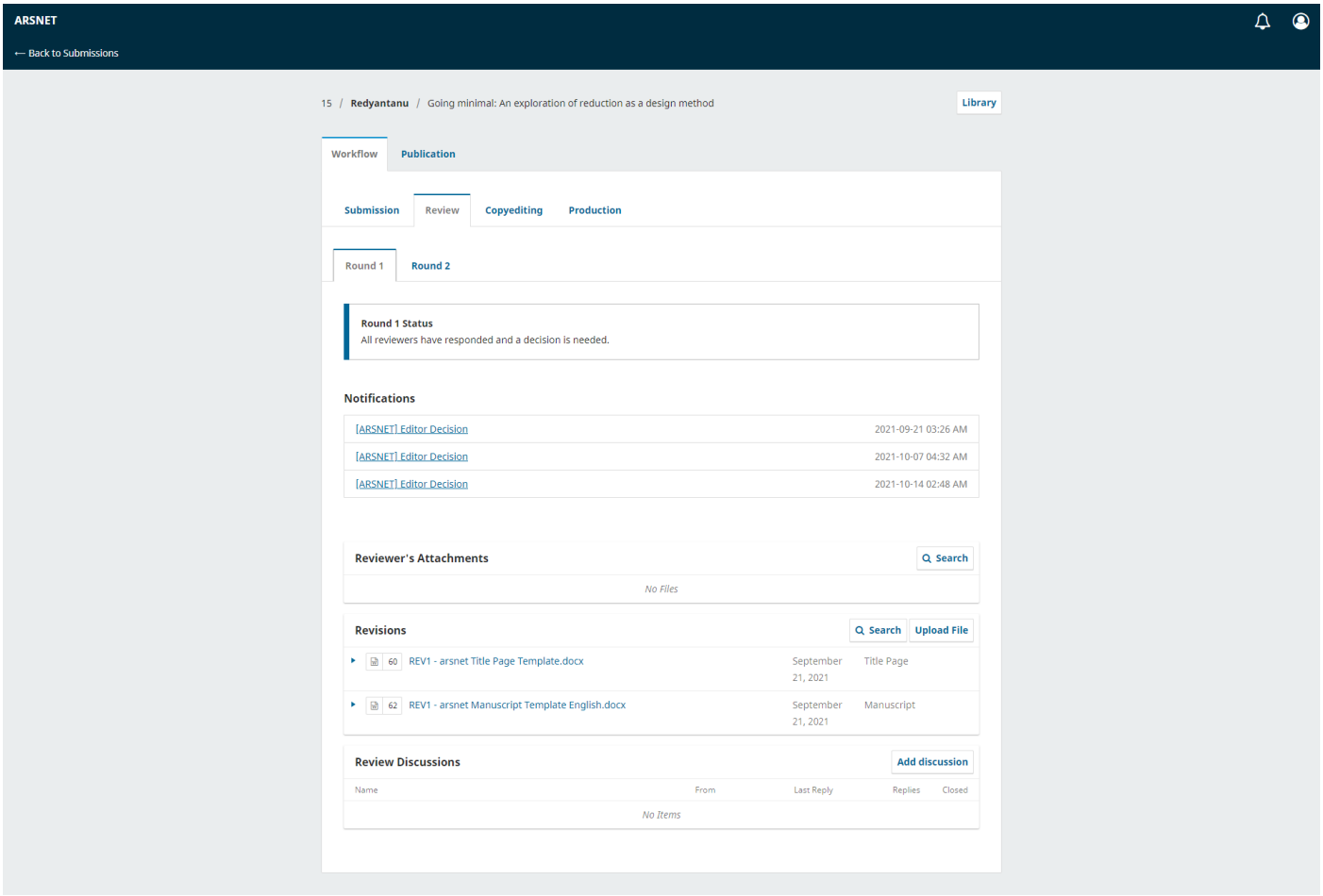
- The content of the manuscript, at least regarding its main intention, is relevant to the aims and scope of ARSNET journal.
- The main intention of the author is clear, which is to discuss the idea of minimalist architecture as a design approach or design strategy in solving various design problems, instead of a minimalist as merely a (visual) style. However, the explanation and discussion in the article are inconsistent. For example, in some part, author mention and/or discuss 'Indonesian architecture', which very different idea compared to 'minimalist approach in Indonesian house design'. This inconsistency, and many other issues, result in confusing content that blurs the main intention of the manuscript.
- The overall methods of inquiry being employed is a case study. However, the method to gather the data is unclear. What is the reasoning behind the selected case? Does the author interview the architect of each selected case study, so he/she can have a deep conversation with the architect regarding the role of the minimalist approach in the design process? Does the author visit and observe the selected case? Does the author interview the user/inhabitants (which is an important part to understand the relation between the design approach and the design problems/context)? It seems that all of the data is from secondary sources. The method to analyze the selected case is also unclear. All these questions make the content of the article become questionable, moreover because the author position this article as a critical investigation of a design approach, which required a deeper and more thorough method of inquiry.
- The way the author explains the idea of minimalist/minimalism is confusing. The author starts by explaining minimalist in general. The author then tries to explain the 'pattern' of the minimalist approach in architectural design when the discussion topic abruptly changes and then ends with 10 categories/components of Indonesian tropical architecture. There is a huge gap of explanation that needed to fill in order to connect the idea of a 'minimalist approach in architectural design in general' with 'components of Indonesian tropical architecture'. Not to mention that the theoretical framework in categorizing those 10 components is questionable as well.
- The author also needs to be more careful in utilizing a particular term or idea as the basis of the discussion. 'Indonesian architecture' is not necessarily the same as 'architectural work in Indonesia' or 'architectural works designed by Indonesian architects'. To avoid confusion and misunderstanding, the author should be clear and specific with his/her intention. Did he/she want to uncover the potential role of the minimalist approach in solving a residential design problem, in which he/she use several residential designs in Indonesia? Or did he/she want to discuss the role of the minimalist approach in the process of creating an architecture that can be considered 'Indonesian' (or have 'Indonesian value')?
- There is an 'observation' section in the article, but the content of the section does not explain an actual observation (that has been conducted by the author as a part of this study). Instead, the observation section (and the following 10 sub-section?) is more like merely a short description of various residential projects in Indonesia, in which the author uses some general design terms such as 'condensed space', 'multipurpose area', and 'spacious layout'.
- It is strongly suggested for the author to construct a clear theoretical framework that is specifically built to addresses the question or objective of the study, gather valid data (conduct an actual field observation, interview all stakeholders), and then analyze the data based on the theoretical framework that has been constructed.
- Some grammatical errors result in confusing sentences dan statements. The author should send his/her manuscript to a professional proofreader.
- The author only use photos and drawing/illustration from secondary sources. It is strongly suggested to the author to produce his/her own photos/drawings/illustrations/diagram that can appropriately and creatively represent ideas and findings discussed in the manuscript.
- In its current state, the level of discussion in the manuscript is still on the surface. In order to contribute to the body of knowledge of design, the manuscript needs a major overhaul. The authors need to formulate a clear research question, an appropriate theoretical framework and methods of inquiry, and lastly a deep, consistent, and thorough discussion (that is supported by an appropriate and creative graphical representation).

Reviewer B:

The manuscript has content that is relevant to the aim and scope of this journal, with the purpose has been clearly mentioned. The paper has a good writing structure that is easy to follow and understand. I think the proposed topic will also give a significant contribution to the knowledge of design.

Nevertheless, The method should mention more specific variables/characteristics used to choose the cases. I think fewer (3-5) cases with some added graphical explanations will make the analytical part more focused and sharper.

ARSNET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03 BUKTI REVISI RONDE 2 7 OKTOBER 2021

[ARSNET] Editor Decision

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Kristanti Dewi Paramita <kristanti.dewi@ui.ac.id>
to me

Thu, Oct 7, 2021, 11:32 AM

Dear Bramasta Putra Redyantanu,

We have reached a decision regarding your submission to ARSNET, "UNDERSTANDING MINIMALIST ARCHITECTURE : BEYOND VISUAL LANGUAGE: UNDERSTANDING MINIMALIST ARCHITECTURE : BEYOND VISUAL LANGUAGE".

Our decision is: Revisions Required

Reviewer A:

Despite some revisions that have been made, the paper is currently need to be strengthened further to warrant publication. The author must pay strong attention to the request of revision that is being asked and take some time to look through the reading or drawing materials required to properly and strategically revise the paper. The required revisions can be seen in the file attached, however overall, the main revision points are as follows:

1. There are inconsistencies on how minimalism is depicted in the paper, either as an approach (that demonstrate its significance as design method), or as a style (which then leads to visual appearance). For the sake of relevance to this journal, it is requested that minimalism should be seen as approach which is achieved through the strategies of reductionism.

2. The author must properly situate the theoretical discourse of which this paper is based on, that are based on valid and strong design literatures. Apart from Yossef (2014), I have suggested some references (on the bibliography at the end) that strengthened the paper's understanding on modernist architecture as the basis of reductionist design strategy.

3. Some restructuring and strengthening of the observation and discussion is required. I have suggested moving the categories of the strategies to the observation and merge some of the strategies together, and in the discussion highlight what the categories imply and compare between them to demonstrate the mechanism of reduction strategies and its impact as a design method.

4. The conclusion needs to be expanded, I have provided structures on doing so, from summary of the study and its findings, contribution, future studies, and so on.

ARSNET

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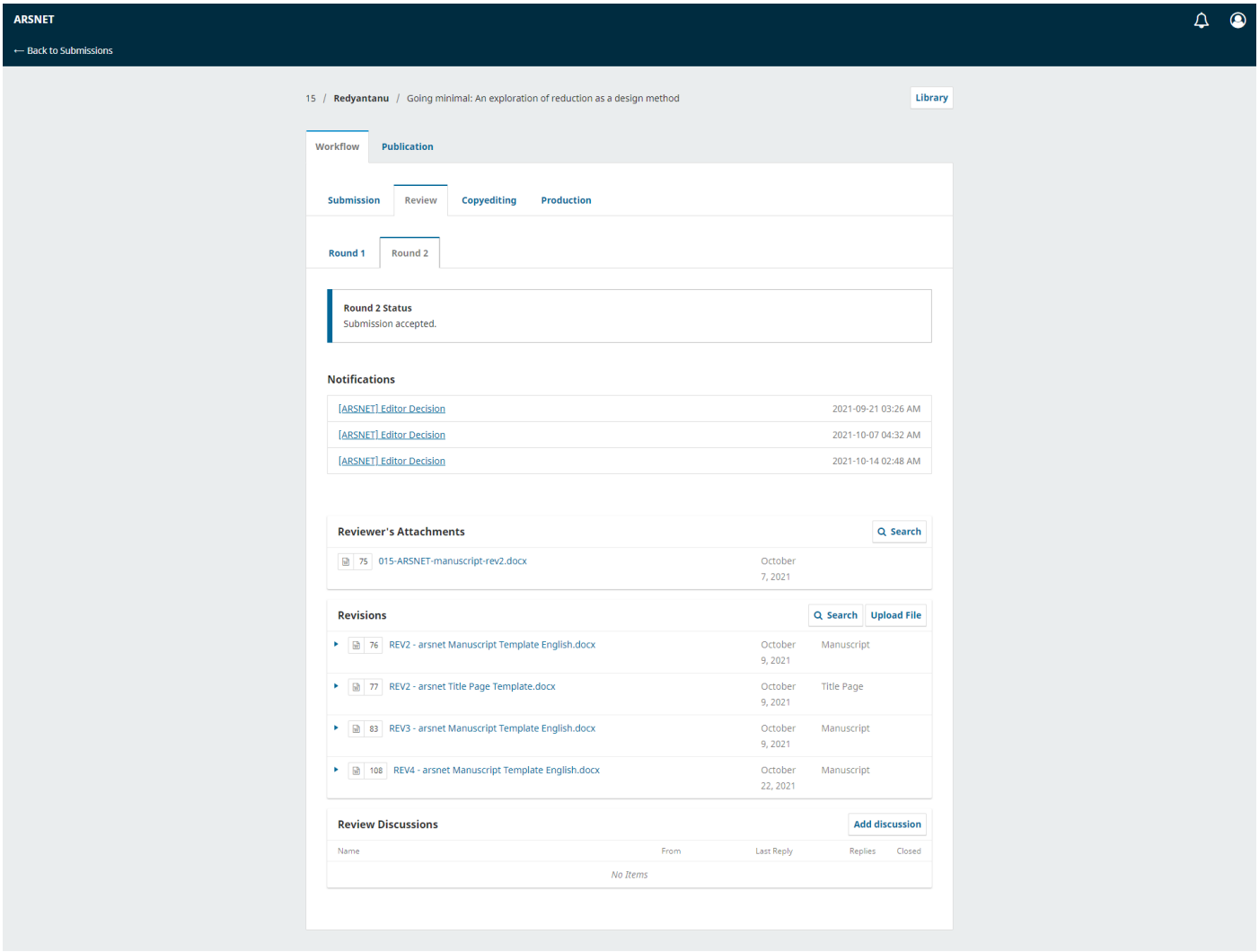
Reply Forward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04 BUKTI PENERIMAAN PAPER 14 OKTOBER 2021

[ARSNET] Editor Decision External Inbox ×

Kristanti Dewi Paramita <kristanti.dewi@ui.ac.id> Thu, Oct 14, 2021, 9:48 AM
to me

Dear Bramasta Putra Redyantanu,

We are glad to inform you that your manuscript "UNDERSTANDING MINIMALIST ARCHITECTURE : BEYOND VISUAL LANGUAGE" is accepted for publication in ARSNET.

Please take a moment to review the following points in order to prepare your manuscript for publication.

1. Your manuscript will go through a line editing process and you will be contacted further for clarification of any issues that may be arisen during the line editing.

2. Following the line editing and layout editing, a proof of your manuscript will be sent to you. You will need to check the proof thoroughly and inform any necessary corrections. The manuscript will only be published after your confirmation that the proof is correct.

3. If your manuscript contains any images, you are required to provide all images as separate .jpg files at 300 dpi. Images may be in colour, however, the images will only appear in colour in the online version of the journal. All images will appear in greyscale in the printed version of the journal.

4. You are required to sign and return the copyright form that will be sent to you in a separate email.

Please do not hesitate to contact us should you have any questions and require further information regarding the publication of your manuscript.

Kristanti Dewi Paramita
Editor, ARSNET
arsnet@ui.ac.id

ARSNET

05 BUKTI KONFIRMASI DRAFT PAPER 21 OKTOBER 2021

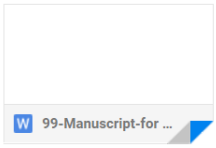
[AN] Editing your article External Inbox ×

Journal Ars.Net <arsnet@ui.ac.id> Thu, Oct 21, 2021, 2:43 PM
to me

Dear Bramasta Putra Redyantanu,

We would like to request some revision on the introduction and literature review of your article. Attached is the file that has been annotated for your reference. The main requests of revision are to 1) revise the introduction to emphasise state of the art and 2) revise the literature review to highlight dialogues between arguments. In doing such revisions, we would like to strongly request that the overall citation technique of the paper must be revised and done properly. A useful guide on such techniques for APA 7 format that we use in this paper can be found in this link.

We look forward to receiving your revised manuscript before 25th October 2021 to be processed further for publication.
Best Wishes
Kristanti Paramita
Editor, ARSNET
arsnet@ui.ac.id



https://doi.org/10.7454/arsnet.v1i2.15

Articles

Vol. 1 No. 2 (2021)

Going minimal: An exploration of reduction as a design method

Bramasta Putra Redyantanu*

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- reductive
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- design approach
- housing design
- Indonesian architecture

Abstract

The purpose of this paper is to reflectively explore minimalist architecture as an architecture that is driven by the reduction-based design method. The discussion aims to reframe the design processes and methods of minimalist architecture as informed by field observation. The phenomenon of applying a minimalist architectural approach has become a trend in small-scale housing in Indonesia lately. In the country, the small-scale residential design processes take place in different contexts and are faced with various limitations, from resources, budgets, land size, materials, and so on. The study will frame this discussion around exploring the reductive design method as a way of responding to these limitations. Informed by design strategies from the modern architecture movement, the study was conducted by observing reduction strategies in eight small-scale domestic design which was published and well-narrated in various media. The study findings demonstrate that the reduction does not only exist in the visual aspect of the design and construction process. It also exist in numerous other design elements, such as materials, forms, spaces, and ornamentation, as a strategic response towards the limitations of various resources.

[AN-Authors] New Publication Vol 1 Issue 2 (2021) External Inbox ×

Journal Ars.Net <arsnet@ui.ac.id>
to me

Mon, Nov 1, 2021, 10:52 AM

Dear Bramasta Putra Redyantanu,

We are happy to inform you that your article has been published. Please see the details below.

ARSNET Vol. 1 No 2 (2021)
https://architecture.ui.ac.id/arsnet
A publication by Department of Architecture, Faculty of Engineering Universitas Indonesia

This issue of ARSNET explores architectural design methodologies based on stories and their corresponding spatial operations.

Editorial
Telling stories, performing operations as a design method
Kristanti Dewi Paramita

Tracing London's urban living room
Anak Agung Ayu Suci Warakanyaka

Going minimal: An exploration of reduction as a design method
Bramasta Putra Redyantanu

Ruang daring bercerita: Sebuah narasi lentang tule, navigasi dan batas dalam arsitektur
Nina Dwi Handayani

Play, space, and the magic circle: Reinventing the game
Robin Hartanto Honggare, Fauzia Evanindya

Coffee story: Unveiling indigenous delicacy through sensorial transaction
Fariz Hirzan, Yandi Andri Yatmo

Thank you for publishing your work with ARSNET journal. Please kindly inform your colleague about this journal.

Best,
Kristanti Dewi Paramita
Editor in-chief
arsnet@ui.ac.id
architecture.ui.ac.id/arsnet

Thanks a lot. Noted with thanks. Thank you so much for the great news!

Reply Forward

ISSN 2777-0710 (*online*)
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GOING MINIMAL: AN EXPLORATION OF REDUCTION AS A DESIGN METHOD

Bramasta Putra Redyantanu

ARSNET, 2021, Vol. 1, No. 2, 108–121
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GOING MINIMAL: AN EXPLORATION OF REDUCTION AS A DESIGN METHOD

Bramasta Putra Redyantanu

Petra Christian University
Indonesia

Abstract

The purpose of this paper is to reflectively explore minimalist architecture as an architecture that is driven by the reduction-based design method. The discussion aims to reframe the design processes and methods of minimalist architecture as informed by field observation. The phenomenon of applying a minimalist architectural approach has become a trend in small-scale housing in Indonesia lately. In the country, the small-scale residential design processes take place in different contexts and are faced with various limitations, from resources, budgets, land size, materials, and so on. The study will frame this discussion around exploring the reductive design method as a way of responding to these limitations. Informed by design strategies from the modern architecture movement, the study was conducted by observing reduction strategies in eight small-scale domestic design which was published and well-narrated in various media. The study findings demonstrate that the reduction does not only exist in the visual aspect of the design and construction process. It also exist in numerous other design elements, such as materials, forms, spaces, and ornamentation, as a strategic response towards the limitations of various resources.

Keywords: reductive, minimalist, design approach, housing design, Indonesian architecture

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Correspondence Address: Bramasta Putra Redyantanu, Architecture Department, Faculty of Civil Engineering and Planning, Petra Christian University, Jl. Siwalankerto No.121-131, Surabaya 60236, Indonesia. Email: bramasta@petra.ac.id

Introduction

Modernity in architecture significantly influences the development of design across contexts. The modern movement covers a broad spectrum, including design knowledge and cycles related to the evolving social, cultural, and economic aspects (Ali, 2018). Modern architecture must display an honest, original quality of itself, where the ornaments will never be forced or feel contrived, not pursuing appearance and more pursuing functionality (Lescaze, 1937; Mallgrave, 2005). In modern architecture, honesty is not only an effort to achieve beauty, but it also refer to the effective and efficient design and construction process as a response to industrialisation and economic conditions (Larson, 1993). The application of this method to buildings within the society often focuses on pursuing simplicity and affordability while leaving the rest remains to be seen (Jordy, 1965). The culmination of the modern movement was the search for a universal language of architectural design with the idea of minimalism, which is the climax of modern art and architecture before moving on to postmodern architecture (Foster, 1996; Krauss, 1985).

The minimalist architectural trend has started in Indonesia in the early 2000s (Lukito & Handoko, 2018). Minimalist architecture is translated as a building with simple geometry, dominant white colour, minimal spatial arrangement of partitions, basic/raw materials, and the dominance of elements such as steel, concrete, and glass (Lukito & Handoko, 2018). The application of the above strategy in residential design is growing quite rapidly in small-medium scale residential homes in Indonesia (Wahjutami, 2017). In the context of small and medium-sized houses, the design strategy brings the discourse on the application of modern and minimalist architecture to various design inquiries. Is the application of these design approaches and methods just for the sake of appearance? Do minimal and reductive paradigms in design contribute to broader things, such as understanding space, strategy for managing resource constraints, and so on? The significance of the discussion developed from this article seeks to explore the thoughts and methods of reductionism as the basis of architectural design, especially in residential design in Indonesia. Observation of an evolving habituation pattern can present a new idea, beauty, and life system (Reisner, 2019), thus further expanding the understanding on how modernity translates in Indonesian architecture.

Modernity and reduction as design method

Minimal architecture cannot be separated from the modern architectural movement. Since 1960, minimalism has become commonplace in art, architecture, and lifestyle (Elangovan & Madhumathi, 2021). Visual arts and architecture categorise modernism as object-based art (Macarthur, 2002). The modern architectural movement was influenced by many things, including the De Stijl school of art from the Bauhaus school of art (Elangovan & Madhumathi, 2021). The modern movement in design aimed to make architecture something

universal. Ornament, which had been 'detached' from the 'base' of purely geometric structures by classical eclecticism, was reduced in the name of simplicity, industrialised building coverings, and economic effectiveness (Graafland, 1996). For design rationalisation, many people see modern architecture as something pure, free from excessive ornamentation, with emphasis on function and buildability, and focus on the accuracy of economic solutions that represent practical values in design (Gropius, 1965). The development of this discourse is that architecture emerges as more than just based on its economic function and strategy, but as a focus of thought on spatial vision and mastery of spatial design (Gropius, 1965).

The idea of modern architecture, and among them the international style developed rapidly since World War II, driven by the destruction and the need for rebuilding (Frampton, 1980). This condition is also supported by the industry's growth, which enabled production of materials on a large scale and in a systematic way, which architects then use as the basis for designing buildings. The transformation of the production cycle and material distribution brought changes to modern industry (Lescaze, 1937). The development of industrial materials brought new meaning to architectural design, new structural ideas, open free space, and freedom of walls as the main load-bearing. Architecture became free and flexible (Lescaze, 1937). Modern architects at that time had the motto of simplicity, economic efficiency of time, and quality; with all efforts to reduce ornaments, decorations, sloping roofs, and other additional elements (Lescaze, 1937).

Rationality, standardisation, and functionality are the most common characteristics of modern architecture (Ali, 2018). Fabricated materials are superior to natural materials because of their accuracy and modularity (Frampton, 1980; Gropius, 1965). Standardisation is the impact of manual and mechanical collaborative work processes related to industrialisation, making designs very systematic and having implications for cost savings (Gropius, 1965). The connection between rationalisation and standardisation increases the efficiency and effectiveness of financing and resource management and improves the quality of the function of a dwelling (Ali, 2018).

We may identify how minimal building design resulting from the above simplification leads to reduction efforts based on several characteristics (Jordy, 1965; Yossef, 2014). The physical object of architecture is simplified due to the reduction of ornamentation to achieve its essential value (Ruby & Ursprung, 2003). Neutral colours and exposed materials emphasise the industrial processes behind them (Pawson, 2005). Opening to outdoor space and lighting become dominant (Bertoni, 2002). Simple geometric shapes are used as neutral shapes. The mixture of boundaries and separators in space becomes a feature that shows the effect of regulating the inner space (Obendorf, 2009; Vasilski, 2012). In general, the characteristics of this reductive architecture focus on simple forms without ornamentation, open interior spaces, and the use of industrial materials that are

widely exposed (Hitchcock, 1932). The compilation of reduction aspects can be seen in Figure 1.

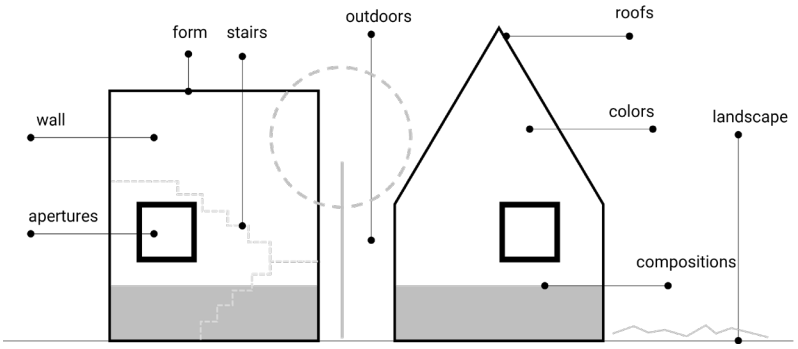


Figure 1. Visual typology of minimalist architecture

Minimal architecture glorifies simplification and reduction of design elements to their most essential values (Cuito, 2002). As part of the modern movement, minimalist architecture perceive architecture as something universal, can be implemented globally anywhere (Ibelings, 1998). However, the role of culture and locality can define the unique character of each region (Dragana, 2012; Elangovan & Madhumathi, 2021; Nikolic & Vasilski, 2017; VanEenoo, 2011). Cities in Indonesia have a particular character of user, material industry, resources, location, and climate. Understanding the principles of modernity and reduction in design, of course, will bring significance to a more in-depth discussion contextually. The discourse in this article explores the possibility of developing insight and knowledge from implementing the reduction paradigm in modern Indonesian architecture. The reflection of design documentation can develop a close relationship between the designer and his circumstances or environment so that the future creations can be better (Schön, 1983).

Observation: Reductive strategy of recent Indonesian small houses

The article explores case studies of Indonesia's small-scale dwelling projects that were documented in the media with good narratives. The project should have been designed and built for around five years. I interviewed the architect directly, and further observations were made employing the literature study approach, ensuring the relevance of the chosen works towards the exploration of reductionism.

Reductions related to design and construction processes and management

The first strategy can be seen in the project designed by SPOA. SPOA is an architectural bureau owned by Rahmat Indrani that particularly focuses on reduction as part of its design strategy. Redu House is a manifestation of the bureau's reduction thinking. The project seeks to implement the reduction of architectural elements holistically, by covering the dimensions of space, material variations to design and construction management. Indrani revealed during the interview that the material's

simplicity speeds up the overall design process (Redyantanu, 2021). Because there are not many layers of material in the design drawing software, managing drawing documents becomes easier. The building process is scalable and easily organised through construction worker management. Such simplicity creates time reduction which then had a knock-on effect on cost savings, resulting in meagre construction costs (Agustriana, 2019). An illustration of the process of reduction strategy in terms of design and construction management can be seen in the diagram in Figure 2.

Figure 2. Reduction in design and construction (Source: Modification of SPOA's images)

Within this reduction strategy limitation of unnecessary wall partitions, excessive ornamental decorations, and material schemes as much as possible generates simpler construction drawings as well as a more straightforward design process. With a precise and planned working process due to the simplicity of the design drawings, the organisation of construction workers for the construction phase tends to be more manageable, reducing the overall complexities of design and construction.

Reduction of activity space and building form

A second strategy is an approach demonstrated by DFORM, which is an architectural bureau owned by Mande Austriono. The architect's private residence, named MO House, was designed with the principle of simplicity ("MO House," 2018). The architect created the programming and the building form of the design with simplicity in mind. With basic shapes, this structure aims to capture the essence of space: materials, details, lighting, and user conditions. The absence of a partition to provide privacy is represented in the essential space, only achieved by utilising the building elevation. Simplicity represents the married couple's lifestyle as inhabitants, as well as their everyday existence. The structure prepares the existing land in the back area for future growth if the home has to be enlarged without causing harm to the central system. In the interview session, Austriono said that placing the house on the front side and the remaining land

on the backside would make it easier when one day the house needs to be further developed, supported by the simplicity of the circulation that occurs in it (Redyantanu, 2020). The house he dreams of is a house with a simple roof that blends with the facade of the building. Diagram in Figure 3 summarises the form and space reduction strategy.

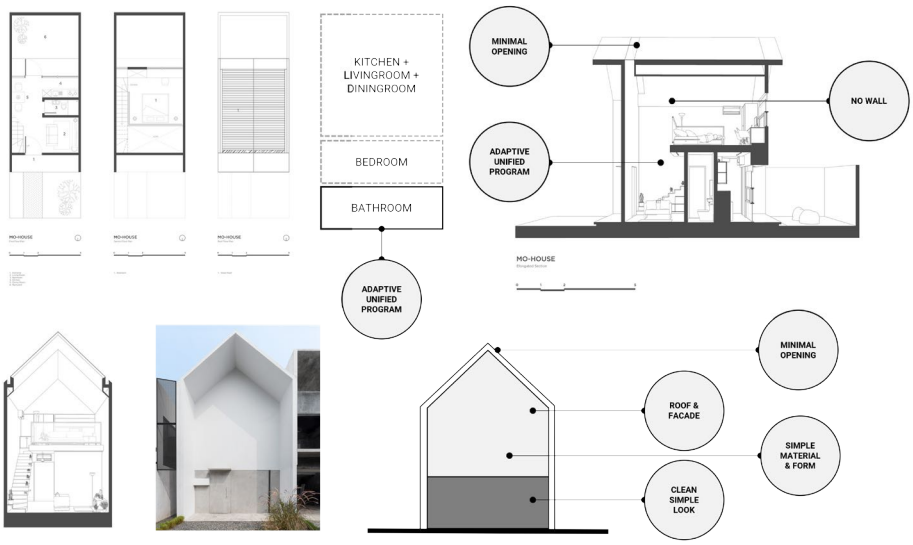


Figure 3. Reduction in form and space (Source: Modification of DFORM's images)

Another case of reduction of form and space can be seen from the work DUA STUDIO, an architecture bureau run by Dimas Satria dan Andy Hartono, in their work entitled 4x6x6 House. The project is a residence designed with the simplicity of the program and the shape of the house (*4x6x6 House*, n.d.). The concept is similar to the previous MO House, although this house demonstrates more flexibility with variations in room elevation. The activities are separated into three levels, each defined on a non-standard basis. As a method for achieving adaptable, flexible, and cost-effective spaces, space is arranged with the elimination of partition walls, in addition to the execution of the simplicity of construction materials and shapes. The diagram in Figure 4 shows how the form and space reduction method is implemented.

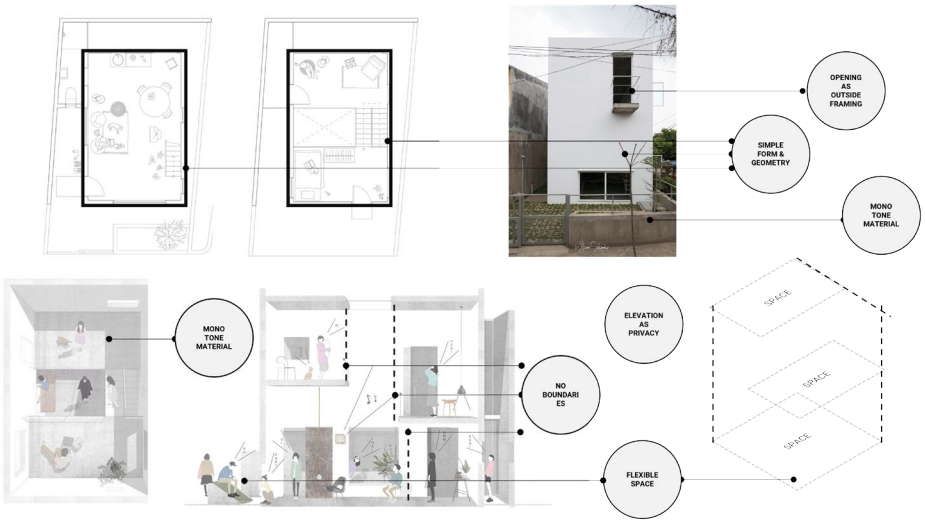


Figure 4. Reduction in form and space (Source: Modification of DUASTUDIO's images)

Another unique case study can be seen in C- House, which is the work by ARA STUDIO. C- House demonstrates an exploration of the shape of the space by reducing the partition of the roof and the building facades ("C- House," 2018). Buildings are generally designed with a composition that differentiates between the roof, the facade, and the body of the building. However, the reduction effort in the design of this house can be seen in the roof shape that drives the space configuration in the upper room, as well as its material that determines the overall facade. This strategy is done to save the development cost. The roof is connected to the second floor, allowing natural light and ventilation to pass through the gaps between the roof planes. The strategy of form and space reduction technique in C- House is depicted in the diagram in Figure 5.

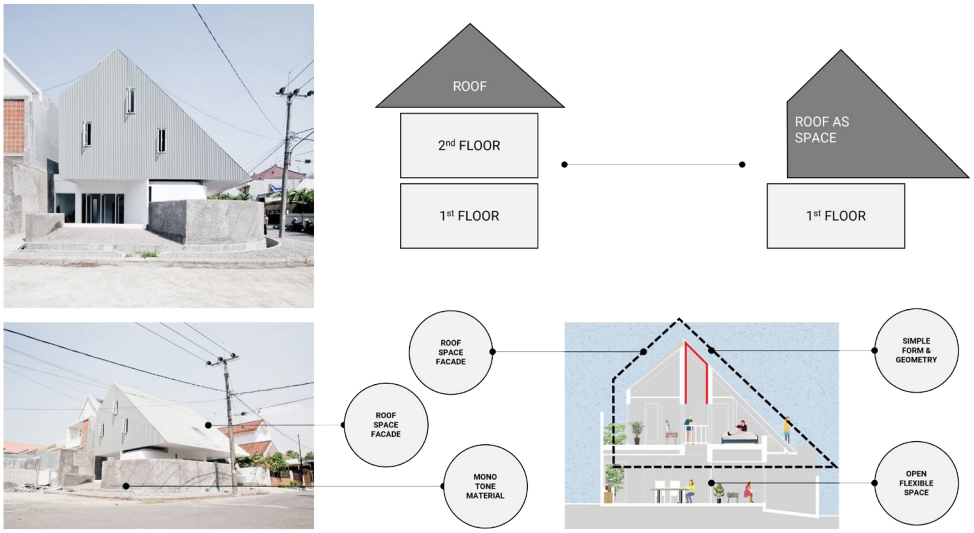


Figure 5. Reduction in form and space (Source: Modification of ARASTUDIO's images)

In this strategy, the amount of space needed is reduced by combining multiple activity programs with similar characteristics. The common spaces of the living room, kitchen, living area, and dining room are all integrated into a single area. The main goals of this unification are spatial flexibility and adaptability. With unified space and minimum partition, the limited land area does not appear to be a small space but instead creates a more spacious experience. Elimination of roof shape that is joined to the facade plane and the overall building mass create a basic geometry that demonstrates the simplicity of the shape that is intertwined with the simplicity of the spatial organisation inside it.

Reduction of colour and material variations, as well as decorative elements

This reduction strategy is present in Sontang Siregar's work, H House. Siregar is an Indonesian architect who specialises in small-to-medium-scale residential projects. His work is continuously formed from plain white square geometry, with limited materials like exposed paint and cement. This design is done to conserve budgets as well as create the illusion of more space on land that is often tiny and narrow ("Dinding sekaligus

lemari," 2017)). Creating unified spaces, employing furniture as room separators, and establishing a relatively low height according to the multiples of modular materials are some of the methods he employs. His work appears identical because of the limited resource, yet the diversity of context is reflected in the layout arrangement, which accommodates varied constrained circumstances on site. The diagram in Figure 6 shows examples of material reduction methods and ornamental details within Sontang's work.

Figure 6. Reduction in material, ornament, color and space (Source: Modification of SONTANGMSIREGAR's images)

FFFAARRR's work is another example of reduction strategy by eliminating material differences and decreasing ornamental features, as can be seen in their shared residential house project titled Bauen Haus. This boarding house is designed with not too many material variations, dominated mainly by exposed brick and cement on the inside. The dominance of the bricks aims to create light and air conditioning with each brick arrangement placed apart from one another (*Bauen Haus*, n.d.). The use of raw materials orients toward simplicity of maintenance, which is highly relevant to the boarding house building's purpose. Minimalist architecture does not have to be dominated by simple white materials. The utilisation of different materials may be sufficient as long as their material differences are minimised and superfluous ornamentation is eliminated. The diagram in Figure 7 shows examples of material reduction methods and ornamental details in the Bauen Haus project.

The facade and building enclosure produced in the project is a pure expression of what is needed inside the building as part of its function. Restriction of materials variation and the dominant use of materials with sufficient character avoid the need for an excessive finishing process. The goal of this reduction strategy is to save costs on construction and building maintenance. Consistent use of materials and colours, in addition, ensuring displayed items are functional features such as window apertures, doors, and façade pores further reduce unnecessary costs and ensure optimum utilisations of the building elements.

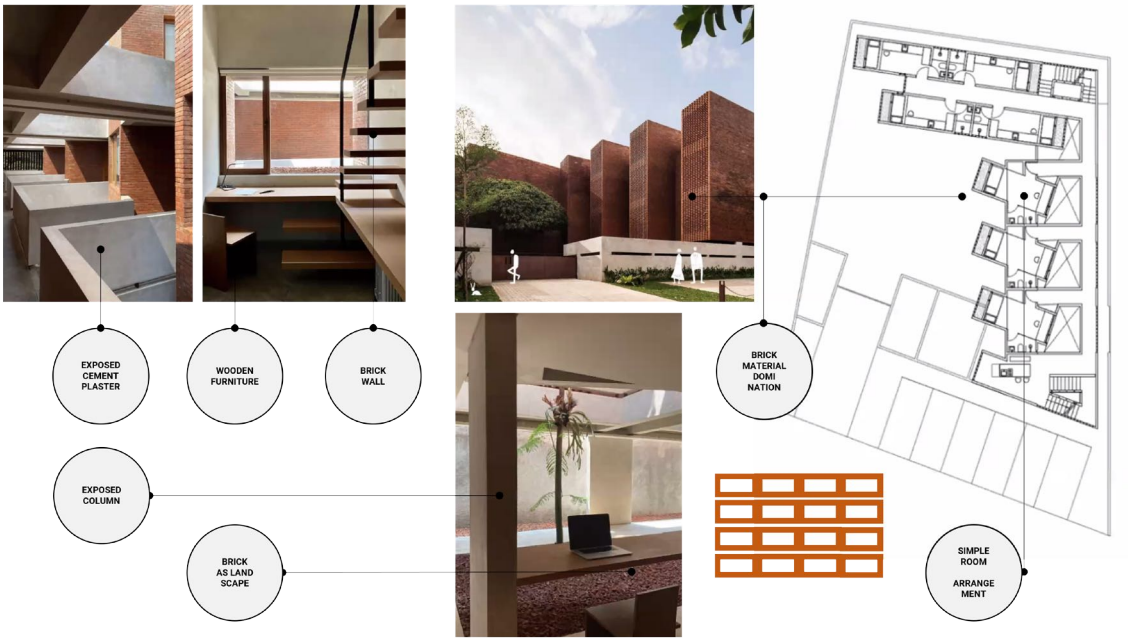


Figure 7. Reduction in material, ornament, color, and space (Source: Modification of FFFAAARRR's images)

Reduction of energy consumption & maintenance

The cost of power for artificial lighting and ventilation is one of the factors that drives up a dwelling's operating costs the most. The space reduction method used in the following house projects demonstrates that shrinking the interior space while keeping the outer area balanced may support the need of saving electrical energy. For example, Byrayboedi's House of Light Void employs the idea of balance between the exterior and the interior ("House of Light Voids," 2021). The division of exterior and interior space as continuous voids on each floor ensure each room obtain a good flow of ventilation and natural lighting ("Natural light floods," 2021). An illustration of how the interior space reduction strategy in House of Light Void may enable electrical energy savings can be seen in the diagram in Figure 8.

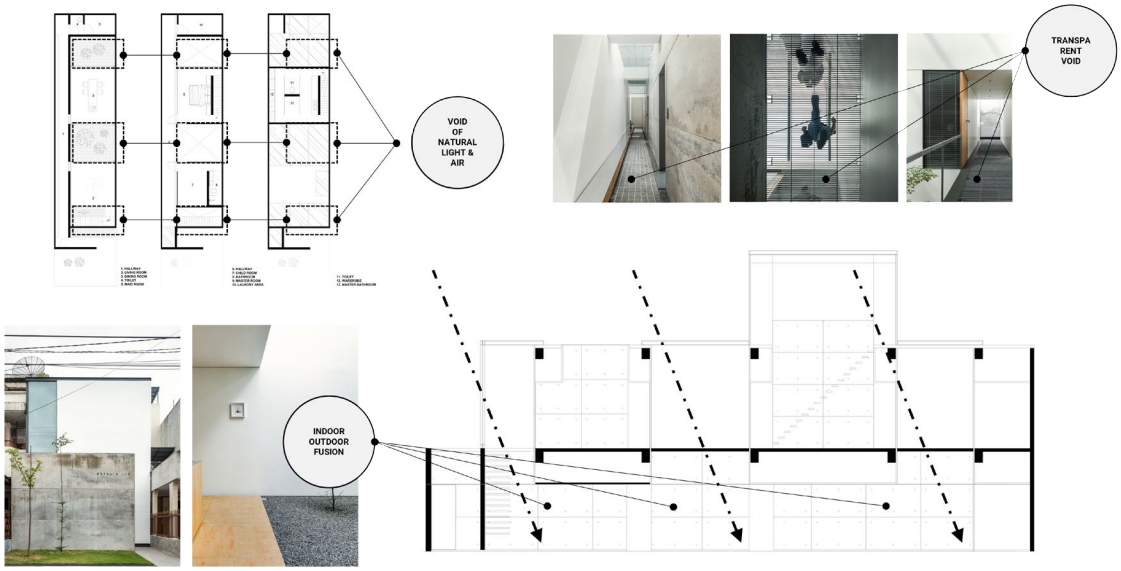


Figure 8. Reduction in energy usage (Source: Modification of BYRAYBOEDI's images)

Rumah 12 by studiokita is the second home that emphasises natural ventilation and lighting ("Rumah 12 House," 2019). In residential houses, privacy is compromised by openness. The concept of openness while preserving privacy is implemented by dominating the building's front with porous cement blocks, resulting in perforations while maintaining privacy. Furthermore, to obtain maximum natural ventilation and lighting, the architect created voids of light air wells on the side of the house, creating active space cooling to reduce the use of electrical energy. Figure 9 shows an example of a closed space reduction method for achieving electrical energy savings in the house.

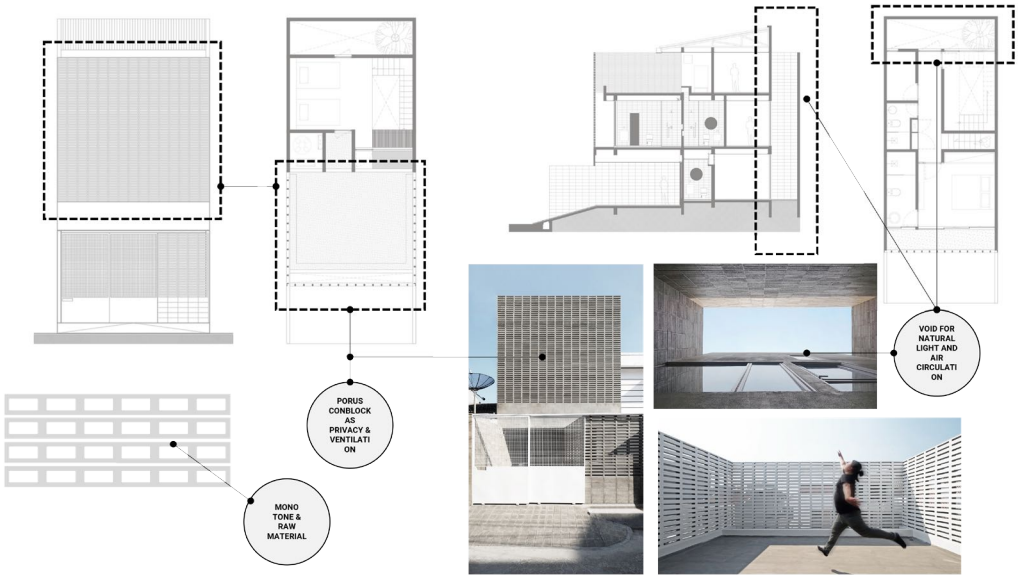


Figure 9. Reduction in energy usage (Source: Modification of STUDIOKITA's images)

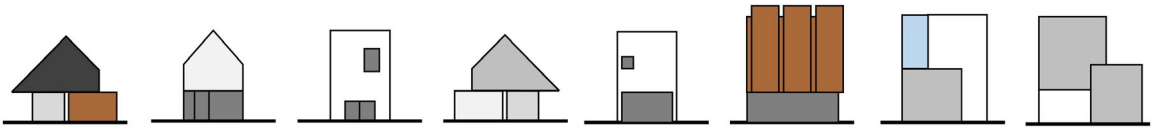
The majority of the works listed above are well-suited to natural lighting and ventilation. Openings in walls, roofing, pore sheathing techniques, and other approaches like voids are some of the tactics employed regarding the site's current conditions. A narrow footprint is appropriate for void-type openings, whereas windows or pores are appropriate for the front of the building, which obtains more flexibility in the overall configuration of surface and building shape.

Discussions

The case examples shown above demonstrate efforts to reduce various things for various purposes. The primary goal of design is to overcome the limitations of multiple things. Limited budgets, limited land, and limited craftsmanship resources are just a few of the factors that make minimalist architecture in Indonesia challenging. The comparison diagram of the overall case study strategies in responding to these limitations can be seen in Figure 10.

Based on the case study examples above, the reduction efforts demonstrate some positive and unique responses to the current Indonesian urban situation. Reductive spatial programming provides the potential for gradual development in

the future, which is beneficial with the lack of dwellers' resources and limitation of land. Furthermore, in Indonesia, the rise of residential property prices limits the availability of housing stock as some buyers only buy houses for investment purposes instead of occupying them. This limited availability of housing stock resulted in smaller utilisation of land and therefore the emergence of tiny houses. The unified and flexible arrangement of activities allows the tiny house to feel more spacious and encourage interaction between activities among the occupants.



	REDUHOUSE	MO HOUSE	4x6x6 HOUSE	C-HOUSE	HET HUIS	BAUEN HAUS	LIGHTVOID	RUMAH 12
Design & Construction Reduction	• Modular Design • Modular Construction • Simple drawing document	• Growth house • Phased construction	• Modular system • Open system • Simple construction	• Modular system • Loft system • Roof space construction	• Modular system • Furniture as partition system • Simple drawing document	• Social house • Modular construction • Modular facade	• Open system • Void system • Grating flooring	• Open system • Void system • Modular facade
Space & Form	• Simple geometry • Roof as space • Modular space • Open plan	• Open plan • Mezzanine open floor • Simple form	• Unified space • Multi open elevation space • No wall system • Cubism	• Roof space • Unified space • Roof geometry	• Simple geometry • Modular system • Cubism	• Cubism • Multi mass modular system	• Cubism • Open void system • Modular space	• Cubism • Chimney system • Open plan
Color & Material	• Raw material • Brick, Cement, Steel, Wood	• Raw material • White paint	• Raw material • White paint	• Roof material as façade • Raw material • White paint	• Raw material • White paint	• Raw material • Brick domination with stack configuration	• Raw material • White paint • Exposed concrete	• Raw material • White paint • Exposed concrete block system
Energy Consumption & Maintenance	• Unfinished material • Natural lighting & ventilation	• Natural skylight • Natural ventilation	• Combined material raw + finished • Natural lighting and ventilation	• Combined material raw + finished • Natural skylight & ventilation	• Combined material raw + finished • Natural lighting and ventilation	• Unfinished material • Natural lighting & ventilation	• Natural skylight • Natural ventilation	• Natural skylight • Natural ventilation

Figure 10. Comparison of case study

Some reduction strategy creates spatial elements with multiple uses. The roof may function as more than just as a covering for the upper side of the house, it also generates the overall space and determines the façade, source of light, as well as performing as the heat barrier. In other examples, the void can be used either as part of an outdoor area, as the basis of the circulation system, and as a source of air and light. Wall material (brick) may double as landscaping material.

Because of the reduction of form variation and emphasis on simplicity, no specialised people are required to carry out the construction process, allowing the development process to run more quickly and at a lower cost. The design's simplicity impacts the workflow's efficiency and effectiveness, resulting in speed and cost savings even throughout the building phase. Simplification of material variations and the use of raw materials within the project also lead to fewer construction costs and easier maintenance and operations in the long term. The room dimension and other aspects of design are arranged based on the consideration of the module size of the material. For example, the architect will use the length of the steel beam to calculate the dimensions of the length and width of the room to reduce excess material. Similarly, the multiplex, gypsum, and partition materials are divided into units based on the room's height to reduce waste disposal. The brick and roster measurements serve as a reference point in establishing the facade configuration.

Conclusions

According to the literature review at the beginning of the study, the reduction approach in minimalist architecture is significantly influenced by the progression of modern architecture. The study finds that the reductive endeavour, which began as a means of reducing certain elements due to boredom and exposing the original value of the building elements, turned out to have a greater significance and value. The reduction technique includes a variety of cost-cutting implications as well as solutions to existing limitations (resources, land, costs), which are common constraints in the Indonesian context, particularly for small-to-medium-scale residential buildings. In addition, this finding suggests that the reduction approach is not simply a philosophical strategy but one that is influenced by the current economic context and development of technology provided by the industry. Understanding the reductive approach as a response strategy is significant since the design process is often being carried out without consideration of what may happen after the building has been constructed.

This study has several limitations, including the inability to conduct direct field exploration due to time and cost limitations, as well as privacy reasons. As the case studies all consist of private domestic spaces, direct visits in the form of observations to residential dwellings become unfeasible. Another restriction is that this study only considers works that have already been widely published in the media to ensure the availability of data as well as prominent application of the strategy. In reality, there are still many works that are not documented or published but may have some significance in the reductive thinking discussion as part of architectural knowledge. Future studies may expand the scope of the study to include a wider range of building in different scales to discover a variety of other factors at operation behind this minimal reduction approach.

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