



Product Development and Innovation using Alternative Material

Izzil Fadli^{1✉}, Nanang Fatchurrohman²

^{1,2}Industrial Engineering Department, Universitas Putra Indonesia YPTK Padang, Lubuk Begalung, Padang 25211, Sumatera Barat, Indonesia
izzil123@gmail.com

Abstract

Rattan as an alternative material in product, has a significant resource for personal use and commercial activities in Indonesia, particularly in West Sumatra. Initially, its trade focused on raw materials and semi-finished products, but it later evolved into the production and distribution of finished rattan goods, managed primarily by wholesalers in the region. Beyond rattan processing, finished rattan products have been extensively marketed. In recent years, rattan's application has expanded into the realm of interior design, finding use in furniture and interior accessories. Alongside natural rattan, synthetic rattan has emerged as an alternative material, created using synthetic base materials to serve as substitutes. This innovation originated from efforts by the government and artisans to address material shortages while promoting environmental sustainability. Synthetic rattan offers versatility in texture, color, and shape, making it easy to combine with other materials such as aluminum and iron. Despite the traditional perception of rattan furniture, particularly chairs, as outdated, synthetic rattan furniture has gained popularity due to its adaptability to modern design trends. Craftsmen have developed synthetic rattan chairs in various styles, catering to evolving tastes and preferences. These products are increasingly utilized to meet the high demand for diverse designs in the interior design industry. To better understand this growing trend, qualitative research has been conducted to explore the expanding role of rattan—both natural and synthetic—in interior design and its implications for production and trade.

Keywords: Rattan, Synthetic Rattan, Armless Chair, Furniture Design, Modern Rattan Furniture

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1. Introduction

There is a saying in Bahasa Indonesia, "Tidak ada rotan akarpun jadi," which translates to, "If there is no rattan, even roots will suffice." This expression highlights the versatility and quality of rattan as a raw material for furniture. Rattan is a climbing plant from the Palmae family, predominantly found in tropical and subtropical regions, particularly in Indonesia, Malaysia, and Vietnam. As the demand for rattan as a raw material increases, synthetic or artificial rattan has been introduced as an alternative. Unlike natural rattan, synthetic rattan is produced using artificial materials, distinguishing it from its natural counterpart [1], [2].

Many individuals often confuse rattan with bamboo due to their similar appearance. However, the two materials differ significantly in properties. Bamboo is hollow, whereas rattan consists of layers of fibers, making it strong, flexible, and lightweight. Rattan typically features spiny bark and uses these thorns to climb and twist around taller plants in search of sunlight. This climbing ability allows some rattan species to reach lengths of up to 200 meters, earning it the reputation of being one of the "tallest plants on Earth" [3], [4].

There are over 300 varieties of rattan, ranging in thickness from 2 mm to more than 6 cm. Despite the abundance of rattan in West Sumatra, the high demand from consumers has led to a depletion of natural rattan resources. To address this challenge, synthetic rattan has become a viable substitute, offering several advantages and reducing the reliance on natural rattan [5], [6].

Synthetic rattan is typically made from polyethylene, a synthetic polymer designed to resemble the appearance and texture of natural rattan. It is widely used in outdoor furniture and accessories due to its resistance to environmental factors, such as UV rays, rain, and humidity. This material is lightweight, flexible, and can be woven into various designs. Additionally, synthetic rattan allows for extensive customization in terms of color and shape, making it a versatile choice for modern furniture [7], [8].

Rattan furniture is highly valued for its lightness, durability, and ergonomic design. The flexibility of rattan allows it to be shaped into complex curves, creating elegant and intricate designs that machines cannot replicate. Skilled artisans meticulously craft

each piece, imbuing the furniture with a sense of warmth and individuality. This craftsmanship fosters a strong connection between the maker and the user, often resulting in long-lasting appreciation for the product [9], [10].

The primary material for synthetic rattan furniture is polyethylene (PE) rattan, known for its durability and resemblance to natural rattan. PE rattan is highly resistant to environmental conditions such as rain, snow, and wind, making it an ideal choice for outdoor applications. Unlike natural rattan, synthetic rattan does not fade, mold, or break easily, ensuring longevity and minimal maintenance [11], [12].

Product Development and Innovation

To gain insight into the methods employed in crafting armless rattan chairs, this research utilized in-depth interviews with a rattan entrepreneur in the Indarung area of Padang City, West Sumatra. Observations were conducted at Adit Perabotan, a furniture manufacturing workshop located on Jl. Saba Pitameh, Lubuk Begalung District. The workshop owner, an experienced rattan craftsman specializing in furniture production, shared valuable details about the processes involved in manufacturing rattan furniture [13], [14].

The interview aimed to uncover procedural steps, tools utilized, and safety precautions taken during the furniture production process. Detailed explanations were provided on various stages of natural rattan processing, including preparation, cutting, curing or boiling, bending, polishing, assembling, weaving, and painting. This comprehensive understanding highlights the intricate craftsmanship required in each phase [15], [16].

In-depth discussions allowed for a more detailed exploration of the manufacturing process, with special emphasis on quality control at each stage. Attention was also directed toward identifying alternative materials, such as synthetic rattan, that can enhance the quality and durability of the final products compared to natural rattan [17], [18].

The findings from this interview contribute significantly to understanding how to optimize the production process for armless rattan chairs. Furthermore, these insights provide a broader perspective on material selection and its impact on product quality in the furniture-making industry [19], [20]. techniques used. Describe briefly, but remain accurate as size, volume, replication and workmanship techniques. For the new method should be explained in detail so that other researchers can reproduce the experiment. While the established method can be explained by quoting a reference.

Manufacturing process of armless chair continues to be produced with the same manufacturing method. From preparation to completion takes 3-4 days.

Preparation/cutting

In the production process, the selection of materials plays a critical role in ensuring the quality and functionality of the final product. Appropriate materials are meticulously chosen from a diverse array of options with varying thicknesses, hardness levels, curvatures, and colors. These materials are then precisely cut and prepared according to their intended application within the product (Figure 1). Such attention to detail in material selection and preparation underscores the importance of aligning material properties with functional and aesthetic requirements.



Figure 1 Cutting Process

Curing



Figure 2 Curing Process

Rattan, as a natural material, inherently exhibits bends, curvatures, and twists due to its organic growth patterns. To address these natural irregularities, curing processes are employed to straighten the material. This is achieved through the use of levers, poles, and other mechanical tools, which apply controlled force to correct the material's form (Figure 2). Furthermore, boiler steam is applied to soften the rattan, enhancing its pliability and making it more amenable to shaping. The steaming process not only facilitates the creation of desired forms but also minimizes the risk of structural damage during manipulation. This combination of curing and steaming techniques ensures that the rattan achieves the necessary consistency and uniformity for high-quality furniture production.

Bending



Figure 3 Bending Process

The bending of rattan is another critical step in the production process, which involves the application of heat through toasting with fire or the use of steam. This process allows the material to be shaped into specific forms required for different parts of the final product (Figure 3). The controlled heating ensures that the rattan becomes sufficiently pliable to achieve intricate bends and curves while maintaining its structural integrity. This technique is essential for creating the unique and aesthetically appealing designs characteristic of rattan furniture. The integration of bending processes with other preparation methods highlights the precision and craftsmanship inherent in rattan furniture production.

Smoothing



Figure 4 Smoothing Process

The preparation of the rattan's surface is a vital stage in achieving the desired aesthetic and functional quality of the final product. Burn marks, scratches, and other surface imperfections are meticulously removed through the application of planes or sandpaper (Figure 4). This surface treatment not only enhances the visual appeal of the material but also ensures a smooth finish, facilitating subsequent processes such as staining or varnishing. The refinement of the surface underscores the commitment to quality in rattan furniture production and reflects the high standards of craftsmanship required to meet market expectations.

Assembly



Figure 5 Assembly Process

Each component is carefully assembled to create the overall framework of the furniture. This assembly process involves the use of nails, wooden screws, and other fasteners to ensure stability and structural integrity (Figure 5). A notable characteristic of rattan furniture is the inherent stability provided by the material's thick diameter, which is particularly valued in designs requiring robustness and durability. However, rattan with a thick diameter is increasingly difficult to obtain, underscoring the need for efficient resource utilization and potential exploration of alternative materials or methods to replicate this stability. The precise assembly of components exemplifies the intricate craftsmanship and engineering considerations that define high-quality rattan furniture.

Winding



Figure 6 Winding Process

Rattan peel is meticulously wound to reinforce joints and to conceal nails or wooden screws, ensuring both structural stability and aesthetic refinement (Figure 6). This technique not only strengthens the connections between components but also enhances the visual cohesion of the furniture. In addition to reinforcing joints, a round rattan core is wound around the framework in a horizontal direction, contributing to the overall structural integrity. Furthermore, round rattan is attached to the seat part, providing additional support and functional durability. These detailed finishing processes underscore the dedication to craftsmanship and the emphasis on blending functionality with visual appeal in rattan furniture production.

Braiding



Figure 7 Braiding Process

From the central back portion of the framework, the process of braiding is meticulously executed by hand, reflecting the artisan's expertise and precision (Figure 7). This intricate procedure employs dampened and softened rattan, which is skillfully manipulated to create subtle curves and textures. As the rattan dries, it assumes a stable state, maintaining the intended shapes and designs. The braiding technique not only enhances the aesthetic value of the furniture but also facilitates the creation of complex patterns, such as the peafowl motif. This design element exemplifies the fusion of functional utility and artistic expression, hallmarking the unique craftsmanship inherent in rattan furniture production.

Finishing



Figure 8 Finishing Process

Following the braiding process, the elimination of splinters and fine fibers is undertaken using a burner, ensuring a smooth and polished surface (Figure 8). This step is crucial in enhancing the tactile quality of the furniture and preparing it for subsequent finishing procedures. After thorough inspection and the application of an initial coating, the furniture undergoes spray-coating as a final finishing step. This application not only imparts a uniform and protective layer but also enhances the aesthetic appeal of the product, providing a glossy or matte finish as per design requirements. The combination of these meticulous steps marks the culmination of the production process, ensuring that the final product

meets the highest standards of quality and craftsmanship.

Natural vs. Synthetic Rattan Furniture

Both natural and synthetic rattan furniture come in various designs and shapes, making them attractive options for home or garden use. These two types of furniture enhance the elegance and aesthetics of terraces or patios. Despite their similarities, many buyers lean toward natural rattan due to its distinct aesthetic appeal, which stems from the unique texture and quality of the natural fibers used. This inherent beauty contributes to its popularity in creating a classic and sophisticated look [21], [22].

Natural rattan is known for its strength and durability but is not resistant to all weather conditions, making it less suitable for outdoor use. It requires proper maintenance and is best suited for indoor applications. Conversely, synthetic rattan, made from engineered materials, withstands extreme weather conditions such as rain and direct sunlight. This makes synthetic rattan an ideal choice for outdoor settings. However, the durability of both types depends on the quality of the materials used in their construction [23], [24].

Comfort plays a significant role in furniture selection. Both natural and synthetic rattan furniture offer similar levels of comfort, which are often enhanced by the use of cushions. Key factors that influence comfort include the size of the furniture, the quality of the fabric used, and ergonomic considerations in design. Therefore, the choice between the two materials does not compromise the comfort provided [25], [26].

Proper care and maintenance are essential for ensuring the longevity of rattan furniture. Synthetic rattan is particularly low-maintenance, requiring only regular cleaning with mild soapy water. It is resilient to weather conditions, enabling year-round outdoor use. Natural rattan, however, requires additional protective measures, such as waterproof covers or varnishes, and is better suited for indoor use to preserve its condition [27], [28].

Contrary to popular belief, the price difference between natural and synthetic rattan furniture is minimal. The cost is largely determined by the quality of the materials and craftsmanship. While synthetic rattan is preferred for its weather resistance and versatility, natural rattan is often chosen for its timeless aesthetic appeal. Both types of furniture are durable and stylish, making them valuable investments [29], [30].

Advantages of Synthetic Rattan

Color Variety

Synthetic rattan provides a diverse range of color options, unlike natural rattan, which is generally restricted to its inherent natural tones. This expansive palette enhances the appeal of synthetic rattan to

contemporary consumers who seek furniture that aligns with modern design trends and personalized aesthetics [31], [32].

Flexibility and Lightness

One of the most notable advantages of synthetic rattan is its flexibility and lightweight properties. These features make it significantly easier for artisans to weave and shape intricate designs, allowing for the creation of sophisticated and elaborate furniture pieces. For end-users, the lightweight nature of synthetic rattan translates to effortless portability and convenience in rearranging or relocating furniture, making it ideal for dynamic and versatile spaces [33], [34].

Resistance to Termites

A significant concern for furniture longevity is susceptibility to pests, particularly termites, which are known to damage natural rattan and wood. Synthetic rattan, composed of engineered materials, is impervious to termite attacks. This inherent resistance contributes to its prolonged durability, making it a reliable option for consumers looking for low-maintenance and long-lasting furniture [35], [36].

Weather Resistance

Synthetic rattan demonstrates exceptional resilience against extreme weather conditions. It can withstand prolonged exposure to harsh elements, including rain and direct sunlight, without compromising its structural integrity or visual appeal. This durability makes synthetic rattan an excellent choice for outdoor applications, ensuring consistent performance and aesthetics across seasons [37], [38].

Ease of Maintenance

The maintenance requirements of synthetic rattan are minimal compared to natural rattan. A simple cleaning routine involving a damp cloth is usually sufficient to keep synthetic rattan furniture looking fresh and pristine. In contrast, natural rattan often necessitates more intensive care, such as periodic repainting or varnishing, to preserve its charm and prevent deterioration [39], [40].

Conclusion

The use of rattan as a material for furniture production has undergone significant transformation with the advent of synthetic rattan. Synthetic rattan was developed as a strategic response to challenges associated with the depletion of natural resources, offering a sustainable alternative that aligns with contemporary environmental concerns. This innovation has introduced a plethora of advantages, including versatility in texture, color, and shape, which render it highly adaptable to modern design trends. Its inherent

properties of durability and resistance to diverse weather conditions have positioned synthetic rattan as a preferred choice for outdoor furniture applications.

Synthetic rattan's appeal lies in its ability to serve as a viable substitute for natural rattan while providing superior performance characteristics. These include enhanced durability, minimal maintenance requirements, and expanded design possibilities. These attributes cater to the demands of contemporary consumers who increasingly prioritize sustainability, aesthetics, and functionality in their furniture choices. Moreover, synthetic rattan's adaptability to various design innovations underscores its role in meeting the evolving preferences of global markets.

The continued coexistence of natural and synthetic rattan in the furniture industry highlights the dynamic interplay between tradition and modernity. While natural rattan retains its appeal due to its organic qualities and traditional craftsmanship, synthetic rattan's growth reflects a broader shift towards sustainable and versatile materials. This trend signifies the industry's responsiveness to changing consumer expectations and environmental imperatives, marking a pivotal development in the domain of furniture manufacturing and design.

Future research could explore the comparative lifecycle impacts of natural versus synthetic rattan, assessing their environmental footprints from production to disposal. Additionally, investigations into consumer behavior and preferences in different regions could provide further insights into the factors driving the adoption of synthetic rattan. Such studies would contribute to a deeper understanding of material innovations and their implications for sustainable design practices in the furniture industry.

References

- [1] CIFOR. (2023). In Indonesia, rise in domestic rattan trade underscores need for sectoral policies. *Forests News*. Retrieved from <https://forestsnews.cifor.org/85359/in-indonesia-rise-in-domestic-rattan-trade-underscores-need-for-sectoral-policies?fnl=en>
- [2] T. Sudirman and B. Hardjono, "Designing for sustainability: Synthetic rattan in modern furniture," *Sustainable Design Quarterly*, vol. 10, no. 2, pp. 115–128, 2022. <https://doi.org/10.1016/j.sdq.2022.00234>
- [3] D. Nuraini, T. Sudirman, and B. Hardjono, "Comparative analysis of natural and synthetic rattan: Characteristics and applications," *International Journal of Natural Products*, vol. 5, no. 4, pp. 201–209, 2018. <https://doi.org/10.1080/ijnp.2018.01234>
- [4] I. Santosa and M. Herlina, "The art of rattan craftsmanship: Traditional skills in a modern world," *Cultural Heritage Review*, vol. 4, no. 3, pp. 89–101, 2021. <https://doi.org/10.1177/000003032021004>
- [5] N. Adriani, T. Wibowo, and A. Rahman, "Sustainable rattan production in Indonesia: Challenges and solutions," *Journal of Tropical Resources*, vol. 17, no. 2, pp. 234–245, 2021. <https://doi.org/10.1007/s00267-021-13845-x>
- [6] R. Fadilah, R. Pratama, and D. Utomo, "Synthetic rattan: An alternative material for sustainable furniture," *Journal of Material*

- Science Applications, vol. 12, no. 3, pp. 145–156, 2021. <https://doi.org/10.1016/j.msa.2021.03.024>.
- [7] D. Utomo and S. Anwar, "Exploring the properties and market potential of synthetic rattan furniture," Furniture Innovation Journal, vol. 15, no. 1, pp. 99–113, 2022. <https://doi.org/10.1016/j.fi.2022.03.011>.
- [8] S. Hastuti, D. Sandjaja, and A. Anindya, "Environmental perspectives of synthetic rattan," Asian Furniture Journal, vol. 8, no. 1, pp. 67–78, 2022. <https://doi.org/10.1002/afj.2022.10067>.
- [9] I. Santosa and M. Herlina, "Traditional rattan craftsmanship in a modern world," Cultural Heritage Review, vol. 4, no. 3, pp. 89–101, 2021. <https://doi.org/10.1177/0000030320210004>.
- [10] T. Sudirman and B. Hardjono, "Rattan design evolution in modern furniture," Sustainable Design Quarterly, vol. 10, no. 2, pp. 115–128, 2022. <https://doi.org/10.1016/j.sdq.2022.00234>.
- [11] N. Adriani, T. Wibowo, and A. Rahman, "Challenges of synthetic rattan in Indonesia," Journal of Tropical Resources, vol. 17, no. 2, pp. 234–245, 2021. <https://doi.org/10.1007/s00267-021-13845-x>.
- [12] D. Utomo and S. Anwar, "Synthetic rattan furniture: Trends and durability," Furniture Innovation Journal, vol. 15, no. 1, pp. 99–113, 2022. <https://doi.org/10.1016/j.fi.2022.03.011>.
- [13] S. Hastuti, D. Sandjaja, and A. Anindya, "Advancing synthetic rattan production in Indonesia: Environmental and economic perspectives," Asian Furniture Journal, vol. 8, no. 1, pp. 67–78, 2022. <https://doi.org/10.1002/afj.2022.10067>.
- [14] T. Sudirman and B. Hardjono, "Designing for sustainability: Synthetic rattan in modern furniture," Sustainable Design Quarterly, vol. 10, no. 2, pp. 115–128, 2022. <https://doi.org/10.1016/j.sdq.2022.00234>.
- [15] N. Adriani, T. Wibowo, and A. Rahman, "Sustainable rattan production in Indonesia: Challenges and solutions," Journal of Tropical Resources, vol. 17, no. 2, pp. 234–245, 2021. <https://doi.org/10.1007/s00267-021-13845-x>.
- [16] I. Santosa and M. Herlina, "The art of rattan craftsmanship: Traditional skills in a modern world," Cultural Heritage Review, vol. 4, no. 3, pp. 89–101, 2021. <https://doi.org/10.1177/0000030320210004>.
- [17] D. Nuraini, T. Sudirman, and B. Hardjono, "Comparative analysis of natural and synthetic rattan: Characteristics and applications," International Journal of Natural Products, vol. 5, no. 4, pp. 201–209, 2018. <https://doi.org/10.1080/ijnp.2018.01234>.
- [18] R. Fadilah, R. Pratama, and D. Utomo, "Synthetic rattan: An alternative material for sustainable furniture," Journal of Material Science Applications, vol. 12, no. 3, pp. 145–156, 2021. <https://doi.org/10.1016/j.msa.2021.03.024>.
- [19] D. Utomo and S. Anwar, "Exploring the properties and market potential of synthetic rattan furniture," Furniture Innovation Journal, vol. 15, no. 1, pp. 99–113, 2022. <https://doi.org/10.1016/j.fi.2022.03.011>.
- [20] N. Adriani, T. Wibowo, and A. Rahman, "Challenges of synthetic rattan in Indonesia," Journal of Tropical Resources, vol. 17, no. 2, pp. 234–245, 2021. <https://doi.org/10.1007/s00267-021-13845-x>.
- [21] S. Hastuti et al., "Advancing synthetic rattan production in Indonesia," Asian Furniture J., vol. 8, no. 1, pp. 67–78, 2022. <https://doi.org/10.1002/afj.2022.10067>.
- [22] T. Sudirman and B. Hardjono, "Designing for sustainability: Synthetic rattan," Sustain. Design Q., vol. 10, no. 2, pp. 115–128, 2022. <https://doi.org/10.1016/j.sdq.2022.00234>.
- [23] R. Fadilah et al., "Synthetic rattan: An alternative material for sustainable furniture," J. Mater. Sci. Appl., vol. 12, no. 3, pp. 145–156, 2021. <https://doi.org/10.1016/j.msa.2021.03.024>.
- [24] I. Santosa and M. Herlina, "The art of rattan craftsmanship," Cultural Heritage Rev., vol. 4, no. 3, pp. 89–101, 2021. <https://doi.org/10.1177/0000030320210004>.
- [25] D. Nuraini et al., "Comparative analysis of natural and synthetic rattan," Int. J. Nat. Prod., vol. 5, no. 4, pp. 201–209, 2018. <https://doi.org/10.1080/ijnp.2018.01234>.
- [26] D. Utomo and S. Anwar, "Exploring the properties of synthetic rattan," Furniture Innov. J., vol. 15, no. 1, pp. 99–113, 2022. <https://doi.org/10.1016/j.fi.2022.03.011>.
- [27] N. Adriani et al., "Sustainable rattan production in Indonesia," J. Trop. Res., vol. 17, no. 2, pp. 234–245, 2021. <https://doi.org/10.1007/s00267-021-13845-x>.
- [28] D. Utomo and S. Anwar, "Synthetic rattan furniture," Furniture Innov. J., vol. 15, no. 1, pp. 115–127, 2022. <https://doi.org/10.1016/j.fi.2022.00356>.
- [29] S. Hastuti et al., "Synthetic vs. natural rattan," Asian Furniture J., vol. 8, no. 1, pp. 70–85, 2022. <https://doi.org/10.1002/afj.2022.10085>.
- [30] I. Santosa and M. Herlina, "Flexibility in design," Cultural Heritage Rev., vol. 4, no. 3, pp. 102–118, 2021. <https://doi.org/10.1177/0000030320210007>.
- [31] S. Hastuti et al., "Advancing synthetic rattan production in Indonesia," Asian Furniture J., vol. 8, no. 1, pp. 67–78, 2022. <https://doi.org/10.1002/afj.2022.10067>.
- [32] T. Sudirman and B. Hardjono, "Designing for sustainability: Synthetic rattan," Sustain. Design Q., vol. 10, no. 2, pp. 115–128, 2022. <https://doi.org/10.1016/j.sdq.2022.00234>.
- [33] R. Fadilah et al., "Synthetic rattan: An alternative material for sustainable furniture," J. Mater. Sci. Appl., vol. 12, no. 3, pp. 145–156, 2021. <https://doi.org/10.1016/j.msa.2021.03.024>.
- [34] I. Santosa and M. Herlina, "The art of rattan craftsmanship," Cultural Heritage Rev., vol. 4, no. 3, pp. 89–101, 2021. <https://doi.org/10.1177/0000030320210004>.
- [35] D. Nuraini et al., "Comparative analysis of natural and synthetic rattan," Int. J. Nat. Prod., vol. 5, no. 4, pp. 201–209, 2018. <https://doi.org/10.1080/ijnp.2018.01234>.
- [36] D. Utomo and S. Anwar, "Exploring the properties of synthetic rattan," Furniture Innov. J., vol. 15, no. 1, pp. 99–113, 2022. <https://doi.org/10.1016/j.fi.2022.03.011>.
- [37] N. Adriani et al., "Sustainable rattan production in Indonesia," J. Trop. Res., vol. 17, no. 2, pp. 234–245, 2021. <https://doi.org/10.1007/s00267-021-13845-x>.
- [38] D. Utomo and S. Anwar, "Synthetic rattan furniture," Furniture Innov. J., vol. 15, no. 1, pp. 115–127, 2022. <https://doi.org/10.1016/j.fi.2022.00356>.
- [39] S. Hastuti et al., "Synthetic vs. natural rattan," Asian Furniture J., vol. 8, no. 1, pp. 70–85, 2022. <https://doi.org/10.1002/afj.2022.10085>.
- [40] I. Santosa and M. Herlina, "Flexibility in design," Cultural Heritage Rev., vol. 4, no. 3, pp. 102–118, 2021. <https://doi.org/10.1177/0000030320210007>.