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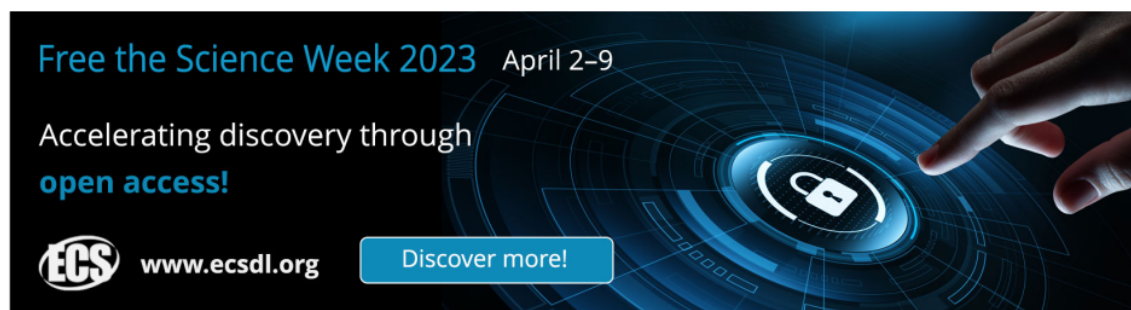
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Analysis of the Wood Production Machine Process for the Application of Wayang Klitik Technology

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Abstract. A review of basic research on wood commodities in the making of wayang *klitik* aims to analyze the characteristics of the flat material and characterization characters. The production process applies wood shaved and splits machine technology. The research stages used a study of the needs of craftsman, designing machine prototypes, product testing, and production implementation. The results of this research are to use the rubber roller against the shaved machine in the left position and split the wood in the right position. The machine's production capacity has a power of 6.5 meters/minute. Engine technology is driven by a 1 Phase 220VAC 2500 RPM 0.5 KW electric motor with chain transmission, gear, pulley, and v belt. The quality of the pieces of wood produces a length of 80-100 cm and a width of 5 cm with a quantity of 5 pieces/minute of wood that is ready for use. This review of findings has identified the creative industry product design from previous research. The follow-up to these results is possible as other economies, education, culture research.

Keywords: wood machine, wayang klitik, split, shaved

1. Introduction

The predominance of technology is predicted to have an impact on the end of traditional arts. Wayang klitik is a traditional art form Kudus, Central Java, Indonesia. Wayang klitik made of wood with design innovation and simple technology to sustain the existence of performances for the younger generation. Wayang klitik is one of the traditional arts that is threatened because the visualization that is displayed requires a reasonably large space and time. The complexity of language knowledge is difficult for the younger generation to understand, so it needs adjustments to today's needs. The role of technology offers an alternative to the aspects of visualization, communication, and discussion of knowledge without requiring limited space and time [1]–[3].

Wayang klitik is a cross-generational mediation tool as a form of interactive social communication on story activities. The effectiveness of stories is believed to be a process of moral and ethical formation. Determining themes, stories, characters and storytelling skills are a requirement for the successful interpretation of wayang stories [2], [4]–[6]. The message of knowledge contained in the play, the novelty of the narrative, the storyline that is familiar with today's life, the characters and situations created affect curiosity and are easily influenced by the message conveyed [3], [7]. Wayang is based on logic, ethics, religiosity, and aesthetics to explain the role of knowledge in life [8], [9]. Wayang klitik is a complex study that must change in technological development. The process of cultural adaptation in wayang has changed the design concept, method, form and structure of dynamic wayang performances through storylines, characterizations and ways of communication that can become new appearances through the role of technology (Murtana, 2019; Rahmawanto & Rahyono, 2019).

This research helps the wayang klitik craftsmen regarding the production of the design of wayang klitik works in various figures and characters. Wooden wayang made of wood can be developed to inspire futuristic and imaginative works of art. The visual art of wayang-klitik



transformed into various characters today is one way of adapting technology in traditional culture [10]–[12]. The development of animation, cosplay, online games in our culture modifies wayang products needed at this time [13], [14]. The transformed wayang klitik production method can be done in several stages—the stages of making a design sketch on a wooden board according to the desired design. Character design ideas can develop according to the imagination and character construction that is built. The stages of the wood pattern cutting are by the design construction to ensure that the composition of the parts is appropriate and does not cause a lot of wood waste.

This cutting technique for cutting the design was developed with a wood shaving and cutting machine. The cutting technique used is a cutting knife with a diameter of 10 inches, with a motor power of 1500 rpm. The propulsion uses an electric motor (1 Phase 220 VAC 1500 RPM 0.5 KW). The pieces of wood produced from the cutting technique will be assembled by assembling each component. The next stage is finishing, namely grinding the wood using a wood shavings machine and closing the wood pores. The next step is a natural colouring that is environmentally friendly. The final stage is finishing with a clear glossy paint with the desired dimensions of the wayang measuring 100x40x20 cm. Technology can create wayang klitik works that combine elements of culture, social values, folklore and symbols of Indonesian character. The emergence of shaved and wood cutting machines made it easier to make wayang klitik that were adapted to the needs of preserving the forest environment, preventing air pollution, and preserving water sources for the community of wayang klitik crafters.

2. Method

The research method uses experimental studies to analyze the performance of wood shaved and split machines in the production of the wayang Klitik material. Engine design using one tool for two functions with two sides. This research has an impact on environmental sustainability, low wood waste, and the design of modern wayang klitik products. This study is limited to, among other things, the type of machine being developed is a wood shaved and split machine to produce wood pieces with a length of ± 80 -100 cm and a width of ± 40 cm and a thickness of ± 20 mm. The machine is designed in one design with two sides working side by side. The machine is driven using an electric motor. The stages carried out in the study of the prototype design of wood cutting and shaving machines are as illustrated in the following figure

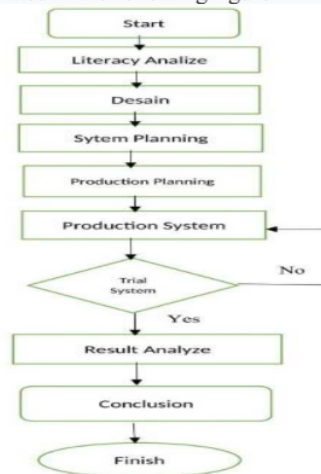


Figure 1. Research Step Resource: Researcher document

The wood shaved and split machine prototype works with a two-sided mechanism driven by a rubber roller—the right side for the drawstring and the left side for the cleaver. Wood shaved

capacity is 6.5 meters/minute, and slitting capacity is 6.5 meters/minute. The propulsion uses an electric motor (1 Phase 220 VAC 1500 RPM 0.5 KW). Transmission using chain, gear, pulley and V belt.

This machine is driven by an electromotor supplied with 220 VAC 0.5 KW of electricity. The power line enters when the button is turned on. The machine will rotate by the driving motor which is forwarded to the driving pulley with a ratio by the V-belt to get the appropriate rotation. Then, it is passed to the driving axles of the shaved rollers and the split rollers with chains and gears. The rubber rollers will rotate to be ready to pull the wooden slats that have been prepared. The slats of wood that have been prepared with pieces ± 80 -100 cm long and ± 40 cm wide are inserted into the funnel. The input of the wood shavings is pulled with a pressing roller on the shaft and plug. The bearings on the product are pressed by a spring to press or press the wooden slats by pulling roller one and continued by pickup roller 2 to feed the drawstring knife to remove the edges of the wood.

After the shrinkage process or removing the skin is complete, the wood pieces are inserted into the split funnel on the left for the cleavage process to become ± 20 mm thick. The cleavage process is almost the same as the shrinkage process. The wood gap that enters the funnel will be pulled with roller press 2 to feed it to the separation knife. The wood separation process makes the diameter and number of pieces according to the size specified on the machine. The attached knife can then be replaced. After cleavage by the cutting knife, the material or wood will be pulled by roller press 2 for the cleavage process to be completed and forwarded to the space provided. This machine can also be run simultaneously, namely the shredding process as well as the wood splitting process. The capacity above is the capacity of alternating roads, 1-stage process with a capacity of 12.5 meters/minute.

3. Result and Discussion

Wayang klitik is a product of the community's economy in Wonosoco Village whose existence is threatened by the use of technology. Technology commitment to culture and traditional creative economy must support the development of Indonesian cultural products. Wayang klitik products are used by the community in the activities of cultural ceremony facilities, communication facilities, entertainment, social interaction and intimacy [15]–[18]. The production of wayang klitik was developed with the help of technology to increase the productivity of wayang klitik works.



Figure 2. Wayang Klitik Resource: Researcher document

The production technique for wayang klitik can be described in several stages: (1) sketching figures through paper drawings or directly on wood, (2) pieces of wooden planks adjusted to the sketches that have been made, (3) giving carving patterns to wayang sketches, (4) sandpaper until it is smooth on the sides of the wooden pieces, (5) give the primary color of the wayang with white, (6) give color to the sketch part of the image according to the character of the wayang

characters, (7) assemble the structure of the wayang characters, (5) provides the primary color of the wayang with the application of white.

The design of wood shaved and split machine with two sides is a design that was first made according to the needs of the craftsmen. The selection of materials and the assembly process is carried out by trial and error method. The machine is designed by striving for parts that are easy to find in the market. With the hope, maintenance of the machine can be carried out without bothering the craftsmen. The wood cutting machine produces five pieces of wood with a length of ± 80 -100 cm and a width of ± 40 cm and a thickness of ± 20 mm. Wood shavings help smooth wood chips. This machine can help performance, save time, save activity and maintain the health of craftsmen from dust and sawdust.



Figure 3. Shaved and Slitting Machine Assembling

Resource: Researcher document

The design of wood shaved, and split machines are identified from the need for a machine that enables safe, easy, and inexpensive machines that support the productivity of making wayang klitik. The criteria for material and technology required are as follows:

Table 1. Identification of the Need for Wood Splitting and Shaved Machines

No	Material Name	Technology Name	Danger	Substitute	Machine Need
1	Design	Figure	Design diversification	Computer Design	Aplication for Design
2	Wood	Knife	Sharp	Machine	Cut and Smoothing Woods
3	Color	Paint	Smells unpleasant	Paint Wood Natural Based	Natural Wood Paint

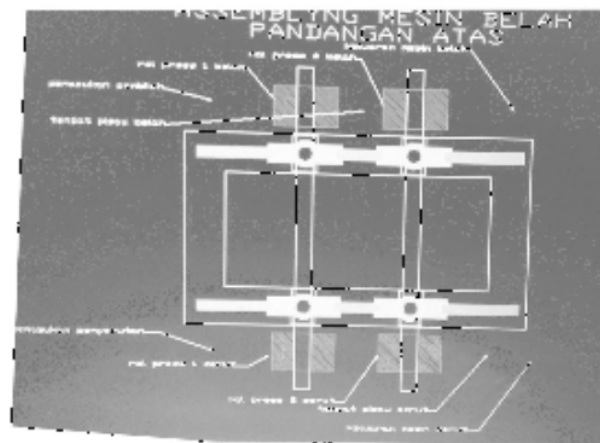
Resource: Researcher identification

Based on the results of observations and analyzes that have been carried out, the need for wood shavings and chopping machines is realized based on the needs and abilities of the craftsmen. The machine design process can be classified with the following material specifications:

Table 2. Specifications of Wood Shaved and Splitting Machines

Tools and Materials	Work system	How To Use
Plat stainless Rangka Size 428 x 428 mm Rubber roll Electric motor (1 Phase 220 VAC 1500 RPM 0,5 KW Chain, Gear, Pulley and V belt	An electromotor from electricity drives the machine. The electrical network that enters the seminar will drive the motor to the driving pulley. The drive motor rotates and is conveyed to the driving axle of the draw roller and splitting roller. Chains and moving gear. the rubber roller moves and pulls the wooden slats that enter the machine	The wood is fed into the machine and pulled by a roller press, then pushed towards the slats to produce the desired thickness. The rolling machine divides the predetermined dimensions of the wood and passes it to the wood shavings input. The rollers move to push wood chips and smooth rough parts.

Resource: Researcher identification

**Figure 4.** Shaved and Slitting Machine Assembling

Resource: Researcher document

The results of the design of wood shaved and split machines, tested the machine's performance to see the advantages and disadvantages of the machine. The strengths of this machine are: (1) the machine can carry out two types of work at one time, (2) the engine capacity if it is moved alternately is 12.5 meters/minute per process, (3) the quantity of wood produced is five pieces per minute and adjusts the size piece. While the weaknesses of this machine are: (1) the splitting knife must be set according to the desired thickness of the wood, (2) if the machine moves continuously without pausing, the machine jams often occur because it is hampered by the remaining pieces of wood, (3) stretching and setting the blade stifle machine performance and production.



Figure 5. Shaved and Slitting Machine

Resource: Researcher document

The performance of the wood shaved and chopping machine at the speed of the motor (1 Phase 220 VAC 1500 RPM 0.5 KW) and the shaved capacitance of 6.5 m / min and the cutting capacity of 6.5 m / min results in the following performance analysis:

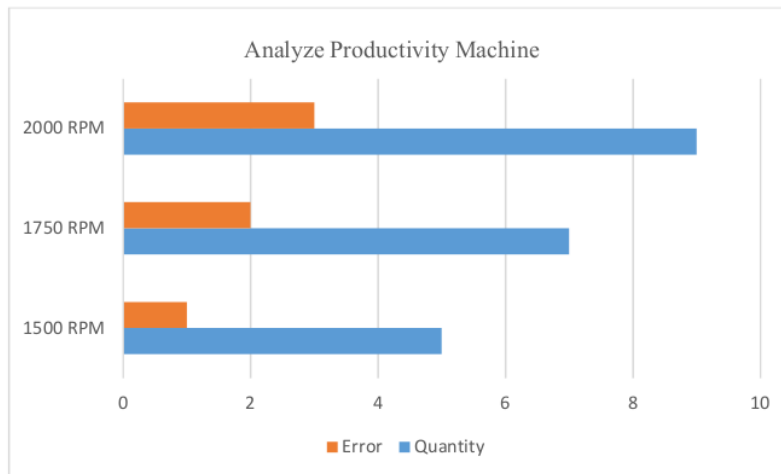


Figure 6. Machine Productivity Analysis

Resource: Researcher analyze

Based on the results of testing the productivity analysis of wood shaved and split machines, it is known that the effect of speed and material force on wood production results. The performance of the roller function is optimal if various sizes of wooden planks support it. The spring function minimizes slippage on the motor when the size of the wood is too large. The function of the cutting knife can be given the task of changing the size, so there is no need to dismantle the pairs in the machine. The economic impact of classical wayang klitik craftsmen on production can be seen from the effectiveness of the resulting production.

The development of shaved and wood cutting machines for the production of shadow wayang klitik in creative crafts can be seen with the concept of environmental ecology. This machine is made with the need for cutting the required wood design patterns, thereby minimizing wood scrap or waste. Wood shaved, and sandpaper machines are designed to minimize dust which has an impact on health and air pollution [6], [15], [19], [20]. The social interaction of the wayang klitik craftsmen with the natural environment of the timber forest prioritizes the sustainability of the forest ecosystem, which is the basis of life for the community of wayang klitik craftsmen.

Table 3. Identification of wood waste from wood shaving and splitting machine processing

No	Part of Design	Quantity Material	Rubbish	Percentage of Rubbish
1	Body	length \pm 80-100 cm	length \pm 5 cm	0.06%
		wide \pm 40 cm	wide \pm 3 cm	0.075%
		thick \pm 20 mm	thick \pm 2 mm	0.1%
2	Hand	Length \pm 100 cm	Length \pm 3 cm	0.03%
		thick \pm 20 mm	thick \pm 2 mm	0.1%
3	Hold	Length \pm 125 cm	Length \pm 5 cm	0.04%
		thick \pm 20 mm	thick \pm 2 mm	0.1%

Resource: Researcher identification

The impact of machine development is to support the fields of product design, technology and social values of wayang klitik products. Wayang klitik communication as a communication tool can be designed with symbols, colors and signs that can stimulate knowledge about the culture. [5], [17], [21]. The concept of harmony in the communication of the wayang klitik performance ensures that social relations are interwoven with various conflicts. The harmony of physical symbols, language style and behaviour in the form of wayang is a combination of social reality [1], [22]. The emotional intelligence that is formed in the harmony of the wayang klitik story can show the social dynamics of society which are manifested in the primary colors red, black and gold. Thus, the ability to read individual psychology can provide experiences from wayang klitik performances. The decision to socialize is observed in the unification of colors, designs, symbols and characters. Therefore, technology support for traditional culture is needed to adapt to global innovation.

4. Conclusion

The design and manufacture of wood shaved and split machine prototypes has been carried out in several steps and methods so that it can work properly. The engine test results show: (1) the machine can carry out two types of work at one time, (2) the engine capacity if it is moved alternately is 12.5 meters/minute per process, (3) the quantity of wood produced is five pieces per minute and adjusts cut size, (4) cutting wood design patterns can minimize woodcutting or waste, (5) minimize the dust that has an impact on health and air pollution. The test results show that there are still constraints in the size or level of wood flakes that require a wood tension control spring and a lever to adjust the wood cutting knife.

5. Acknowledgement

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6. References

- [1] M. I. Cohen, "Wayang in Jaman Now: Reflexive Traditionalization and Local, National and Global Networks of Javanese Shadow Puppet Theatre," *Theatr. Res. Int.*, vol. 44, no. 1, pp. 40–57, 2019, doi: 10.1017/S0307883318000834.
- [2] L. Halimah, R. R. M. Arifin, M. S. Yuliaratiningsih, F. Abdillah, and A. Sutini, "Storytelling through 'Wayang Golek' puppet show: Practical ways in incorporating character education in early childhood," *Cogent Educ.*, vol. 7, no. 1, 2020, doi: 10.1080/2331186X.2020.1794495.
- [3] J. Kurscheid *et al.*, "Shadow puppets and neglected diseases: Evaluating a health promotion performance in rural Indonesia," *Int. J. Environ. Res. Public Health*, vol. 15, no. 9, pp. 1–12, 2018, doi: 10.3390/ijerph15092050.
- [4] P. Scanlon, "Superheroes are super friends: Developing social skills and emotional reciprocity with autism spectrum clients.," *Using superheroes Couns. Play Ther.*, 2007.
- [5] T. Kröger and A. M. Nupponen, "Puppet as a pedagogical tool: A literature review," *Int. Electron. J. Elem. Educ.*, vol. 11, no. 4, pp. 393–401, 2019, doi: 10.26822/ieje.2019450797.
- [6] J. H. Knox, "The global pact for the environment: At the crossroads of human rights and the environment," *Rev. Eur. Comp. Int. Environ. Law*, vol. 28, no. 1, pp. 40–47., 2019, doi: 10.1111/reel.12287.
- [7] A. Tilbrook, T. Dwyer, K. Reid-Searl, and J. A. Parson, "A review of the literature – The use of interactive puppet simulation in nursing education and children's healthcare," *Nurse Educ. Pract.*, vol. 22, pp. 73–79, 2017, doi: 10.1016/j.nepr.2016.12.001.
- [8] S. Purwanto, "Pendidikan Nilai dalam Pagelaran Wayang Kulit," *Ta'allum J. Pendidik. Islam*, vol. 6, no. 1, pp. 1–30, 2018, doi: 10.21274/taalum.2018.6.1.1-30.
- [9] Rofian, "Visualisasi karakter tokoh wayang klitik desa wonosoco kabupaten kudus," 2018.
- [10] C. Case, *Imagining animals: Art, psychotherapy and primitive states of mind*. 2014.
- [11] G. Setiawan1, "Wayang Klithik Robot," *Wayang Nusant. J. Puppetry*, vol. 2, no. 1, pp. 131–141, 2019, doi: 10.24821/wayang.v2i1.3000.
- [12] N. Fajrie, "Media Pertunjukan Wayang untuk Menumbuhkan karakter Anak Bangsa," *Publ. Ilm. UMS*, pp. 218–233, 2013.
- [13] T. B. Wahono, H. Saputra, and C. Huda, "Pengembangan Media Pop Up Sebagai Upaya Melestarikan Wayang Klitik," *Paedagogia*, vol. 21, no. 2, p. 220, 2018, doi: 10.20961/paedagogia.v21i2.13316.
- [14] G. Kress, "Pedagogy as design: a social semiotic approach to learning as communication," *Univ. Tarraconensis. Rev. Ciències l'Educació*, vol. 1, no. 2, p. 23, 2019, doi: 10.17345/ute.2018.2.2488.
- [15] M. H. Birkhold and V. Byrd, "The Studied Environment," *Ger. Rev.*, vol. 94, no. 3, pp. 189–193, 2019, doi: 10.1080/00168890.2019.1634512.
- [16] M. F. Ahlcrona, "The Puppet's Communicative Potential as a Mediating Tool in Preschool Education," *Int. J. Early Child.*, vol. 44, no. 2, pp. 171–184, 2012, doi: 10.1007/s13158-012-0060-3.
- [17] G. J. Domek, L. H. Szafran, L. N. Bonnell, S. Berman, and B. W. Camp, "Using Finger Puppets in the Primary Care Setting to Support Caregivers Talking With Their Infants: A Feasibility Pilot Study," *Clin. Pediatr. (Phila.)*, vol. 59, no. 4–5, pp. 380–387, 2020, doi: 10.1177/0009922820903407.
- [18] N. Fajrie, T. R. Rohidi, M. Syakir, I. Syarif, and A. S. Priyatmojo, "A study of visual impairment in the art creation process using clay," *Int. J. Innov. Creat. Chang.*, vol. 11, no. 10, pp. 199–218, 2020.
- [19] J. McDonnell, "Mind and the Environment," *Axiomathes*, vol. 28, no. 5, pp. 521–538, 2018, doi: 10.1007/s10516-018-9385-3.
- [20] A. Corris, "Defining the Environment in Organism–Environment Systems," *Front. Psychol.*, vol. 11, no. July, pp. 1–13, 2020, doi: 10.3389/fpsyg.2020.01285.
- [21] A. C. A. B. Leite *et al.*, "Children in outpatient follow-up: perspectives of care identified in

interviews with puppet,” *Rev. Gauch. Enferm.*, vol. 40, p. e20180103, 2019, doi:
10.1590/1983-1447.2019.20180103.

- [22] I. Purbasari, N. Fajrie, and J. Putri, “Effectiveness of Motor Skills through Traditional Children
’ s Toys in Autistic Children,” vol. 14, no. 3, pp. 764–782, 2020.

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