



ENHANCING ANIMATION WORKFLOW: DESIGN AND DEVELOPMENT OF AN ADVANCED ANIMATION TABLE FOR TRADITIONAL ANIMATION PRODUCTION

Rodelyn T. Vertudazo

toquerorodelyn@ymail.com

Abstract. The aim of designing and developing an upgraded animation table for traditional animation production is to enhance animator productivity and workflow. With a rich history, traditional animation techniques are still prized for their distinct look and expressive capabilities. Traditional animation creation, however, may be a labor- and time-intensive process that frequently calls for manual frame-by-frame drawing and alignment. An innovative animation table that incorporates modern features to improve the traditional animation workflow is designed and developed in this study. With less time and effort needed for frame alignment, animator productivity in the animation production process increases as a result of these developments that make their job easier and more productive.

The paper emphasizes the issues faced by animators in traditional animation production and the relevance of workflow optimization. It underlines the importance of creating an effective animation table as a solution to these problems. The researcher employed the Analysis, Design, Development, Implementation, Evaluation (ADDIE) model enhancing it to suit the specific requirements of the study. In the analysis phase, the researcher conducted a comprehensive assessment of the attributes found in commonly used light boxes within the animation industry and academic settings. The focus was specifically directed towards traditional animation techniques, with the goal of identifying vital components to incorporate into the Advanced Animation Table for Traditional Animation Production. Additionally, the researcher diligently evaluated the overall development cost of the Advanced Animation Table for Traditional Animation Production, ensuring that the design remained economically feasible. Throughout the development phase, the researcher followed a meticulously crafted Gantt chart, which served as a well-organized roadmap for their activities. This structured framework provided invaluable guidance during the creation and testing stages of the Advanced Animation Table for Traditional Animation Production. The study's findings unequivocally validated the successful development of the Advanced Animation Table for Traditional Animation Production, revealing its remarkable functionality. Thorough stability tests were conducted, affirming the device's seamless rotating capabilities in both left and right directions.

Keywords: Traditional Animation, Animation Table, Industry, Animation Disk, Advanced Animation Table



Introduction:

In recent years, the animation industry has witnessed significant advancements in technology and tools, transforming the way traditional animation is produced. The integration of digital technologies into the traditional animation workflow has opened up new possibilities for enhancing efficiency, productivity, and creative expression. This study focuses on the design and development of an advanced animation table specifically tailored to enhance the workflow of traditional animation production in the contemporary era.

The objective of this study is to address the challenges faced by animators in traditional animation production, such as time-consuming frame alignment and manual labor, by introducing an innovative animation table the best of traditional techniques. By leveraging modern technology, this advanced animation table aims to optimize the animation workflow, streamline processes, and empower animators to unleash their creative potential.

Traditional animation in the Philippines has a rich history and has played a significant role in shaping the country's animation industry. The Philippines has been known for its talented animators and studios that have produced captivating hand-drawn animated works.

With technology taking over so many parts of business, it is only natural to put it into practice. Importance of animation in business is something that can no longer be ignored (Schumacher, 2018). On the other hand, importance of animation in education cannot be ignored because there are many things it can help within the pedagogy. Incorporating animations into classroom instruction can improve educational quality. The educational benefits of animation are well-known. Any idea may be conveyed in a vibrant and aesthetically appealing way.

During the early years of Philippine animation, the industry primarily focused on providing animation services to international clients, particularly in the United States and Japan. Filipino animators gained recognition for their skillful craftsmanship and ability to produce high-quality traditional animation. Many Filipino animators worked for prominent studios abroad, contributing to the production of well-known animated films and TV shows.

In recent years, there has been a surge of interest in developing original Filipino animated content. Local animation studios have been creating their own animated films, TV series, and short films, showcasing unique storytelling and art styles that reflect the rich cultural heritage of the Philippines.

Traditional animation techniques have been utilized to bring these stories to life, emphasizing the hand-drawn aesthetics that are deeply ingrained in the country's animation tradition.



The animation industry in the Philippines has been growing steadily, supported by the government's initiatives to promote and nurture the local animation sector. Various animation festivals, workshops, and training programs have been established to cultivate talent and provide opportunities for aspiring animators. Additionally, the availability of advanced digital tools and software has facilitated the integration of digital techniques into the traditional animation workflow, allowing for greater efficiency and productivity.

To develop this advanced animation table, a multidisciplinary approach is adopted, encompassing fields such as engineering, computer science, and animation production. The design process involves prototyping, iterative refinement, and usability testing to ensure that the table meets the specific needs and preferences of animators in the present-day animation industry.

Methodology

The research design employed in this study was developmental research. According to Richey and Nelson (2001) as cited by Pasion, Cumbe & Vertudazo (2022), developmental research is a systematic investigation that focuses on designing, developing, and evaluating instructional programs, processes, and products. These endeavors aim to fulfil the criteria of internal consistency and effectiveness. Moreover, developmental research involves examining the entire instructional design, development, and evaluation process or specific elements within it (Richey, Klein, & Nelson, 2004). The research and development (R & D) design was also used to design and develop Advanced Animation Table for Traditional Animation Production. This study utilized the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model as its research framework. The ADDIE model has been widely used and referenced in the field of instructional design, but it was initially developed by Florida State University in the 1970s. The specific researcher associated with the development of the ADDIE model include Walter Wager, Conrad Gottfredson, and Michael Molenda. They outlined the model in the book "The Systematic Design of Instruction" published in 1983.

The study was conducted at the College of Industrial Technology of Nueva Ecija University of Science and Technology – General Tinio St. Campus, specifically during the first semester of the academic year 2023-2024. This period allowed for a concentrated exploration of the subject matter, focusing on the design and development of the Advanced Animation Table for Traditional Animation Production.



Results and Discussion

Designing and Developing the Advanced Animation Table for Traditional Animation Production

The designing and developing phase of the Advanced Animation Table for Traditional Animation Production followed the stages of the ADDIE model. However, the researcher excluded the last two stages such as the implementation and evaluation to suit the needs of the study which is to design and develop an advanced animation table for traditional animation production.

Analysis Phase

The analysis phase of the study, the researcher emphasized on researching the features of existing light boxes commonly utilized in the animation industry as well as educational institutions that offer traditional animation courses. The researcher realized several common features of these light boxes after thorough study.

First, the typical light boxes' physical structure was discovered to be bulky, resulting in their massive and heavy character. Because of their bulkiness, they were difficult to manage and carry. A hand-drawn animation disk with a peg bar is a classic tool. It comprises of a round disk with a peg bar attached to it, which is often constructed of a durable material such as acrylic or glass. Peg bars are metal or plastic strips with uniformly placed pegs emerging from them.

The researcher also identified certain drawbacks related to the use of light bulbs in traditional light boxes. These light bulbs consumed a considerable amount of electricity and emitted excessive brightness, without the ability to adjust the brightness level. This lack of control over lighting conditions limited flexibility.

Moreover, the researcher conducted a comprehensive cost analysis to assess the feasibility of developing the Advanced Animation Table for Traditional Animation Production. This analysis aimed to evaluate the overall expenses involved in designing and producing the Advanced Animation Table for Traditional Animation Production, ensuring economic viability for the project. The cost analysis findings are presented in Table 1.



Table 1 Total Costing of the Advanced Animation Table for Traditional Animation Production

Quantity	Unit	Materials	Price
1	pc	16.5” x16.5” Transparent Acrylic Glass	₱630.00
3	pcs	20cm x 20cm ¼ Marine Plywood	₱150.00
1	pc	20cm x 40cm Marine Plywood	₱100.00
1	pc	1 x 2 Tubular	₱365.00
1/4	kl	1” Finishing Nail	₱10.00
1/4	kl	1 ½” Finishing Nail	₱10.00
100	gm	Wood Glue	₱30.00
1	m	16mm Stainless Rod	₱100.00
3	pcs	1” Butt Hinge	₱30.00
250	gm	Sanding Sealer	₱130.00
100	gm	Body Filler	₱50.00
400	ml	Paint Thinner	₱30.00
2	pcs	Sanding Paper	₱30.00
1	pint	Tinting Color	₱70.00
3	pcs	Switch(On/Off)	₱15.00
4	mts	Led Strip Light	₱185.00
1	pc	Spring Latch Catch Toggle Hasp No Lock	₱40.00
4	pcs	1 x 2 Tubular Rubber Footings	₱60.00
1	pc	AC Power Cable	₱50.00
1	pc	2 Pin AC Cord	₱20.00
		Labor Charge	₱1000.00
Total			₱3105.00

Design Phase

The design phase in the ADDIE model is a critical step in instructional design where the instructional designer creates a detailed blueprint or plan for the learning experience. This phase involves translating the analysis findings into a cohesive and effective instructional design that aligns with the learning objectives and meets the needs of the target audience Mayer, R. E. (2014). The design concept of the Advanced Animation Table for Traditional Animation Production was showcased through both orthographic and isometric projections, as depicted in Figure 1. To ensure accurate and precise measurements, the design was meticulously crafted using Computer-Aided Design (CAD) software.

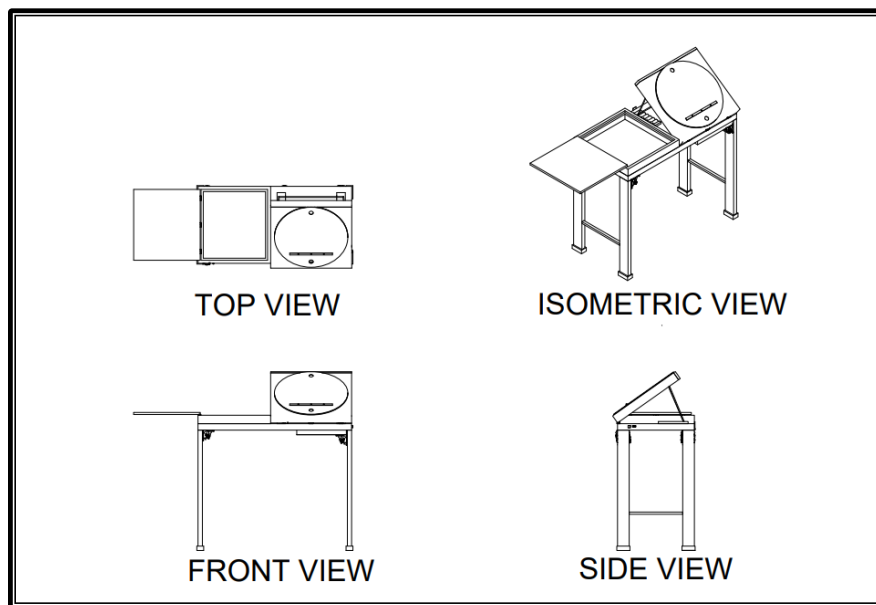


Figure 1 Orthographic and Isometric View of Advanced Animation Table for Traditional Animation Production

The Advanced Animation Table for Traditional Animation Production design encompasses various notable elements. Firstly, it features an orthographic projection, showcasing the top view, front view, and side view, where the object's lines are perpendicular to the viewing plane. Conversely, the isometric projection of the Advanced Animation Table for Traditional Animation Production utilizes an axonometric approach, tilting the three-dimensional object at a 30-degree angle from the horizontal plane, resulting in a more realistic and visually appealing representation.

The Advanced Animation Table for Traditional Animation Production design incorporates several key components. Firstly, it includes a square rotating animation disk equipped with a metal bearing, enabling

effortless circular motion in both directions. Additionally, the design incorporates an improvised peg bar, ensuring secure placement of animation sheets. The inclination of the animation table stand is adjustable into different angles, while the drawing tools compartment can house animation papers and other animation paraphernalia. The researcher also draft the schematic diagram of the developed device which serves as the guide during the installation of the electrical components to avoid mistakes as shown in Figure 2. The diagram was illustrated using Adobe Photoshop software to make it presentable.

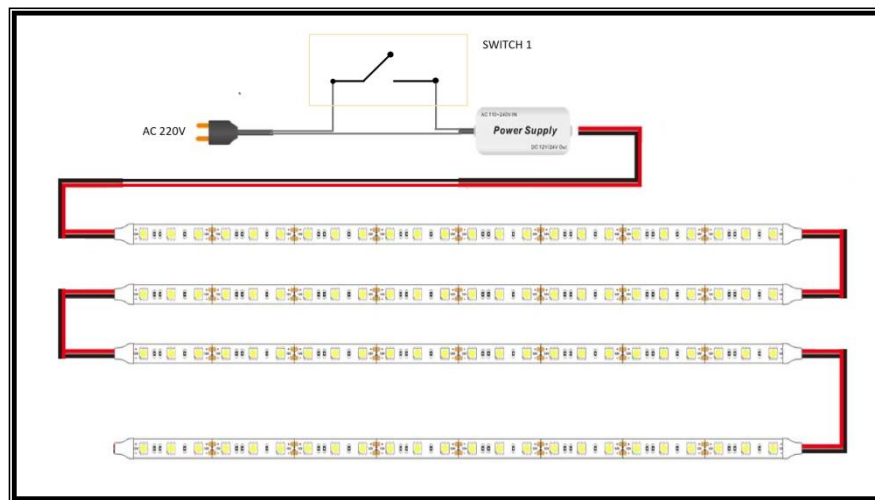


Figure 2 Advanced Animation Table for Traditional Animation Production Schematic Diagram

The electrical circuit diagram of the researcher's Advanced Animation Table for Traditional Animation Production is composed of an AC 220V electrical plug, a switch, a Power Supply and LED strip lights. The function of the AC 220V electrical plug is to supply power to the Power Supply, which converts the <AC 110-220V IN> into <DC 12V/24V OUT> to make the LED strip lights work. Take note that LED strip lights works only to DC 12V/24V that is why Power Supply is needed in this circuit. The switch controls the overall operation of the electrical circuit functionality of the device.

Development Phase

A product development process is the sequence of steps or activities that an enterprise employs to conceive, design, and commercialize a product. Many of these steps and activities are intellectual and organizational rather than physical. Some organizations define and follow a precise and detailed development process, while others may not even be able to describe their process (Ulrich, K. T., & Eppinger, S. D. 2011).

During the development phase of the research, the focus shifted towards the physical construction of the Advanced Animation Table for Traditional Animation Production. This stage prompted the researcher to be



particularly mindful in selecting appropriate materials that matched the envisioned design of the animator's table. The researcher paid close attention to detail as they worked to match the Advanced Animation Table for Traditional Animation Production criteria and functionality.

The researcher utilized the provided Gantt chart, as shown in Table 2, in order to oversee and track the progress of the Advanced Animation Table for Traditional Animation Production development. A Gantt chart is a popular graphical representation of a project timeline. The graphical representation of the project timetable and important milestones was an extremely useful tool for organizing and tracking the construction process. The Gantt chart allowed the researcher to ensure that each activity was done within the timeframe specified and that the overall project remained on track.

Table 2 Gantt chart of Advanced Animation Table for Traditional Animation Production

DEVELOPMENT ACTIVITIES	Timeline							
	Day1	Day2	Day3	Day4	Day5	Day6	Day7	Day8
Purchasing of Materials								
Measuring and cutting materials								
Constructing frame and cutting acrylic sheet								
Painting and assembling the advance animation table								
Connecting and installing the electrical component								
Installing the improvised peg bar								

The creation of the Advanced Animation Table for Traditional Animation Production begins with the design's conceptualization, followed by the purchase of materials required for assembly, measuring and cutting the wood, attaching the wood frame components and the foldable table stand, filling, sanding, and painting the device, mounting and installation of the LED Strip Light, switch and electric plug, cutting the acrylic sheet, and fixing the peg bar of the animation table. Figure 3 shows images taken when the Advanced Animation Table for Traditional Animation Production is being created.

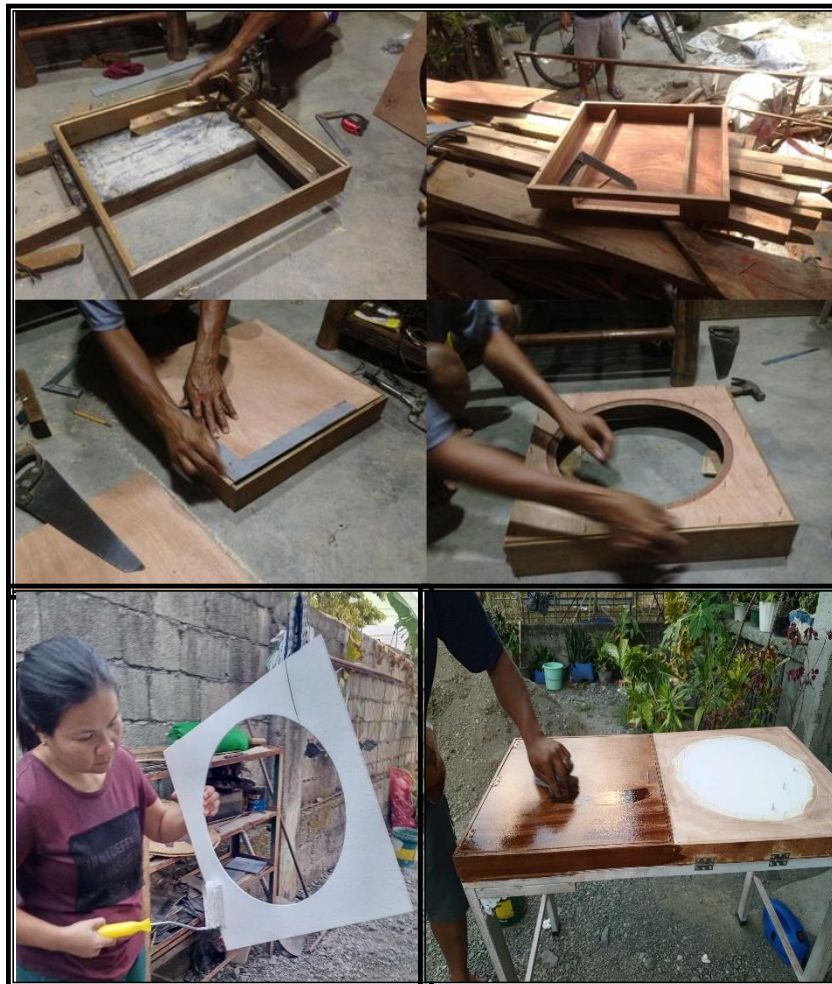


Figure 3 Advanced Animation Table for Traditional Animation Production Development

During the development phase, the researcher proficiency and meticulousness were clearly demonstrated. The researcher diligently assembled the Advanced Animation Table for Traditional Animation Production with the help of skilled carpenter, meticulously adhering to the intended design and skillfully integrating the components with precision. The researcher technical expertise and deep understanding played a crucial role in attaining the desired results, culminating in the creation of a functional and sturdy animator's table. Figure 4 showcases the fully developed Advanced Animation Table for Traditional Animation Production.



Figure 4 The Advanced Animation Table for Traditional Animation Production

The development of the Advanced Animation Table for Traditional Animation Production has the potential to transform the animation business and have far-reaching consequences. With the possibility of being widely adopted, this significant device has a chance to transform the future of animation, equipping animators with new possibilities and moving the industry toward more originality and creativity.

Conclusion

In summary, the research project successfully achieved its objective of creating and improving the Advanced Animation Table for Traditional Animation Production as an innovative tool for animators. Following the ADDIE model, the study not only met its goals but also surpassed the capabilities of conventional animation table. The findings showcased the exceptional functionality of the Advanced Animation Table, effectively addressing existing limitations and providing animators with a valuable asset to enhance their creative process



and workflow. This research represents a substantial contribution to the field of animation, empowering animators with an advanced and enhanced tool to foster innovation and artistic excellence.

References:

- Aljaroudi, A., & Nour, M. (2021). Advanced Techniques for Traditional Animation Production: A Review. *Journal of Visual Communication and Image Representation*, 79, 103084.
- De Vera, R. (2019). "Animating Philippine History: A Study of Philippine Animation's Engagement with National Identity." *Animation Studies* 2.0, 2, 47-69.
- Eftekhari, N., & Zarif, M. D. (2021). Enhancing the Traditional Animation Process Using Digital Tools. In *Proceedings of the 2021 3rd International Conference on Computer Graphics, Image and Visualization* (pp. 1-5). IEEE.
- Paiva, A. R., de Assis, T. A., & Ferreira, J. (2022). Improving Traditional Animation Workflow Through Digital Tools and Techniques. *Journal of Computer Animation and Virtual Worlds*, 33(1), e2010.
- Philippine Animation Industry Primer. Creative Economy Council of the Philippines. Accessed September 2023. [<http://www.creativeeconomycouncil.org/wp-content/uploads/2019/05/Philippine-Animation-Industry-Primer.pdf>]
- Philippine Animation: A Unique Identity. Animation Council of the Philippines. Accessed September 2023. [<http://animationcouncil.org/philippine-animation-a-unique-identity/>]
- Saldanha, A., & Anzai, A. (2021). Revisiting Traditional Animation Techniques: A Study on Combining Traditional and Digital Approaches. In *Proceedings of the 2021 ACM SIGGRAPH Conference on Motion, Interaction and Games* (pp. 1-6). ACM.
- Sotto, R. D., & Sotto, K. S. (2018). "Philippine Animation: A Retrospective." *Animation Studies* 2.0, 2, 27-46.
- The Philippine Animation Industry: An Overview. Invest Philippines. Accessed September 2023. [<https://investphilippines.gov.ph/animation/>]
- Thomas, F., & Johnston, O. (2021). *The Disney Archive: Animation Design + Production*. Chronicle Books.
- Ulrich, K. T., & Eppinger, S. D. (2011). *Product Design and Development*. McGraw-Hill Education. Accessed September 2023. [<https://industri.fatek.unpatti.ac.id/wp-content/uploads/2019/03/202-Product-Design-and-Development-Karl-T.-Ulrich-Steven-D.-Eppinger-Edisi-6-2015.pdf>]