Reviving Indonesian Panji Tales in Modern Fashion Product Design with Augmented Reality

Christabel Parung[1,a)] Markus Hartono[2,b),] Wyna Herdiana [1,c)] Prayogo Waluyo [1,d)]
Guguh Sujatmiko [1,e)] Brian Kurniawan Jaya[1,f)]

[1)] *Faculty of Creative Industries, University of Surabaya, Surabaya,60293, Indonesia*
[2)] *Dept. of Industrial Engineering, Faculty of Engineering, University of Surabaya, 60293, Indonesia*

[a)] Corresponding author: christabelannora@staff.ubaya.ac.id
[b)] markus@staff.ubaya.ac.id
[c)] wynaherdiana@staff.ubaya.ac.id
[d)] prayogo.waluyo@staff.ubaya.ac.id
[e)] guguh.sujatmiko@staff.ubaya.ac.id
[f)] briankurniawan@staff.ubaya.ac.id

Abstract. Panji Tales is one of unwritten folklore in the intangible culture of Indonesia, and since it is unwritten, it is very dynamic. As a part of Panji culture, it has also spread internationally all across South East Asian countries. Nevertheless, the younger generation is not familiar with it. As one of the forgotten cultural heritages, it needs to be preserved. To revive this culture in this modern era, Panji Tales needs to be implemented in modern products that can engage the younger generation of Indonesia. In this study, we explored and created sets of illustrations that are printed on fashion products with implementation of Augmented Reality (AR) technology to revive Panji Tales and attract younger generations' interest in it. ATUMICS method (Artefacts - Technique - Utility - Material - Icon - Concept - Shape) is used to create the fashion product that is integrated with technology and traditional folklore. After the product is designed, a forum group discussion (FGD) was carried out for a concept testing. The product was a tote bag and scarf with scannable illustrations printed on them. The mobile-app Artivive was used as the platform to support Augmented Reality which can be accessed through the users' mobile phone. The output of the research is beneficial for further development in attracting the younger generation in local culture, especially through wearable fashion products.

INTRODUCTION

As an archipelago that is located in Southeast Asia, Indonesia has various ethnic groups that are rich in tangible and intangible cultural heritage. This cultural heritage exists in many forms. Tangible form of culture refers to touchable, or physical products, such as clothing, documents, utensils, traditional architecture, and other physical and touchable products. Meanwhile, intangible forms of culture include tradition that is passed to our descendants, such as skills, practice, events, knowledge, oral tradition like tales and legends, music, etc. [1].Panji Tales is one of unwritten folklore in intangible culture, and since it is unwritten, it is very dynamic. This dynamic allows Panji Tales to develop and continue the tradition [2].The tales are mainly about the love story of Panji Asmorobangun from Jenggala Kingdom and Dewi Sekartaji from Kediri Kingdom. Panji Tales has many versions, and here, Panji Asmorobangun and Dewi Sekartaji can transform into other characters depending on the version of the tale [3]. Panji tales have been told in many versions all across South East Asian countries, orally or written, and the versions are varied depending on the places where the tales are delivered. Just like Indonesia, other countries like Myanmar,

Cambodia, and Thailand have their own versions of Panji stories [4]. This is the proof that Panji tales spread internationally and create cultural diversity among those countries. Transmitted orally and written, Panji tales are also depicted through lots of cultural forms, tangible, and intangible, such as temple reliefs, sculptures, dance performances, wayang etc. Nevertheless, the community begins to forget local culture in this disruptive era. This is caused by the accelerated speed of digitalization and technological transformation [5]. As one of the forgotten intangible cultural heritages of Indonesia, Panji Tales represent a cultural identity that needs to be preserved. The urgence to preserve such culture is increasing especially as there is a huge concern that cultural diversity will soon decline. In the era of rapid digitalization, folklore tales like Panji Tale might be considered irrelevant. In previous study, Putri stated that millennial generation is a threat and opportunity at the same time in preserving intangible cultural heritage. Some people consider this kind of cultural heritage to be ancient and obsolete [6] , whereas in fact, folktales might be helpful to boost their imagination and creativity, and help them to learn values in life. Looking at this phenomenon, an effort needs to be made to raise the existence of Indonesian cultural heritage, especially Panji Tales to the Indonesian younger generation, as the emerging generation. The millennials are a generation that are very technology savvy, and they use the internet as their primary sources for information [7]. In terms of consumption, their consumption of fashion products are also high - Simangunsong [8] found that Generation Z is very consumptive, especially in shopping for fashion products like clothings, scarves, bags and shoes. By looking at this opportunity and millennials' behaviour in consumption and interest, one of the solutions to revive and gain their interest in cultural heritage - especially the Panji Tales, is by creating wearable fashion products that are combined with modern technology. In the previous studies, Yuen et al. [9] has found that one of the technologies that can help preserving cultural heritage by creating an interaction with the user/visitor is augmented reality. In the study, augmented reality was used to digitalize the museum which attract more younger consumers. Hence, in this study, we tried to explore and create scannable illustrations that are printed on fashion products with implementation of augmented reality (AR) technology to revive Panji Tales and attract younger generations' interest in it.

Interpretation of Panji Tales

The great thing about Panji tales is that there was no single author. Panji Tales were written by various authors and each of them has their own version of the stories, based on their location and language. However, the main characters in the stories are always Panji Asmorobangun and Dewi Sekartaji (or known as Candra Kirana). Generally, the various story-line of Panji Tales consist of separation and longing between Panji and Dewi Sekartaji , Panji's journey in search of his lover (Dewi Sekartaji), Panji's love affairs, and reunion of Panji and Dewi Sekartaji. [3]. During its development, Panji Tales have changed structurally. This might be because of society's interpretation that changes over time. For example, Panji Tales was originally a Javanese romantic story in Kediri Kingdom, but somehow the interpretation changed and the tales were adapted as folktales, such as Keong Mas (Golden Snail), Ande-Ande Lumut, Timun Mas (Golden Cucumber).

Keong Mas Folktale

Keong Mas (Golden Snail) is one of the Indonesian folktales that was originally written as part of Panji tales. It was written after the Kediri Kingdom era, but the characters and background elements in the story (like places where the story took place) referred to the Kediri Kingdom era [10]. This Keong Mas Tale's setting took place in Daha and Dadapan village, which is still in the area of Kediri Kingdom. The characters in this folktale are actually Panji Asmarabangun and Dewi Sekartaji. Raden Inu Kertapati is Panji Asmarabangun and Candra Kirana is actually Dewi Sekartaji. [11]

The brief plot of Keong Mas folktale is as follows:

Long time ago, there was a kingdom called Daha Kingdom. Here lived a king named Kertamarta who had two daughters - Candra Kirana and Galuh Ajeng. Candra Kirana was humble, kind, and beautiful, but her sister was wicked. Candra Kirana was engaged to Raden Inu Kertapati who was a prince of Kahuripan Kingdom. Her sister was jealous and she went to a witch to harm Candra Kirana. The witch was very powerful and it could transform into anything. One day, Candra Kirana accidentally threw a snail away into a river. The snail was actually the witch that Galuh Ajeng contacted to harm Candra Kirana. Angry, the witch put a spell on her and changed her into a golden snail and put it away into the river. Not far from the river, lived an old lady. One day, she went to the river to look for fish and found the golden snail. She brought the golden snail home and put it in a jar. The next day, she went to the river again and when she went back home, she was very surprised seeing lots of delicious food presented

on the table. It went on for several days until the old woman pretended to go to the river and hid behind her house. She saw the snail that she brought before turned into a beautiful woman, who is actually Candra Kirana. Candra Kirana admitted that she was a princess of Daha that was cursed into a golden snail by a wicked witch. The spell could only be broken by holy gamelan sound. The old woman went to the palace immediately and she told the Prince (Raden Inu Kertapati) about his fiance and how to break the spell of the witch. After several days praying and meditating, Raden Inu Kertapati was given holy gamelan. He brought it to the old woman's house, and he played the gamelan beautifully. Suddenly, the golden snail turned into the beautiful Galuh Candra Kirana. Not long after that, Galuh Ajeng knew that her sister had been found. She then ran away from the palace and never came back. Finally, the Prince and the Princess got married and lived happily ever after.

Trends

To create a fashion product collection, trend forecasting is needed. Trend forecasting determined upcoming trends, including main theme, colour, fabric, texture, print, graphics, etc. Usually, fashion forecasts are determined 2 years before the new product line is produced and accessible [12]. According to fashion trend S/S 23 issued by WGSN (Worth Global Style Network), the upcoming fashion trend for 2023 will go in a more optimistic and expressive direction. 'Full Spectrum' is all about embracing life with full colour, vibrant, and full of creativity and fun. Full Spectrum action points rely on values, community, connection, and authenticity of local to global stories (glocal). This trend supports the big objective of this paper which is to revive local culture (Indonesian Panji Tales) to go global and accessible for youth around the world by combining it with technology and modernized design.

METHODS

The methods used for this study is the combination of ATUMICS methods and qualitative method as concept testing. ATUMICS method is used arrange and integrate the elements of tradition and modernity, so the products are relevant to be used in this modern era. Concept testing was done by doing a forum group discussion (FGD) of 5 people as the potential users of the products which are from the age group of 20-27 years old (Generation Y and Z).

Atumics Methods for Designing Product

In implementing Panji Tales into new visual for fashion product design with Augmented Reality, we used ATUMICS method. In ATUMICS method, there are 5 elements that are the basics in the cultural transformation: A (Artefact) , T (Technique) , U (Utility), M (Material), I (Icon), C (Concept) and S(Shape). This method is used to combine several cultural and modern elements in designing products [13].

A(Artefact) refers to cultural objects, which in this study, we used Keong Mas/The Golden Snail, as it is one of the most popular folktales in Indonesia. [14], **T (Technique)** refers to technique in producing artefacts. In this study, technique refers to the process of analyzing visual data from artefacts to be implemented into modern products. **U (Utility)** refers to the use of the product. Folktale was used to help humans to understand mankind, and it was passed down to generation to spread the moral lesson of it. **M (Material)** refers to physical products made for certain purposes. **I (Icon)** shows symbols and images, ornaments, colours, and graphic elements of an object. In this study, the product contains symbols and icons that visualize the Panji folktale.**C (Concept)** refers to hidden messages that an object has. It includes characteristics, feeling, emotion, ideology, and culture. Hidden concepts can be seen through an object's visual. **S (Shape)** refers to form, appearance, and visuals of an object. Table 1 shows he ATUMICS method used for designing the product inspired by Keong Mas.

TABLE 1. ATUMICS method for designing fashion product inspired by Panji Tale "Keong Mas"

Variables	Description
Artefacts	The stylization of Keong Mas folktale on fashion products with Augmented Reality.
Technique	The steps include : 1. Creating visual data of Keong Mas story 2. Application of illustration on fashion product 3. Creating video for Augmented Reality and the hidden message of the Keong Mas folktale 4. Uploading the animation video for Augmented Reality in AR platform
Utility	The fashion products are scarves and tote bags. These products ease us to express ourselves, and since the hidden

	message (moral of the story) is shown in the AR when the products are scanned, it can be used for educational purposes.
Materials	The materials for scarves are voile and the materials for tote bags are canvas fabrics.
Icon	Visual : stylized illustrations from the tale of Keong Mas Ornament : the combinations of stylized illustrations from the tale of Keong Mas Colour : Bright colours from Full-Spectrum Trend Forecast
Concept	1. Illustrations depict 3 women character in Keong Mas tale : Candra Kirana, Galuh Ajeng, and the witch. 2. The moral message from the illustration : Jealousy and envy make people do evil things. However, kindness will always win. 3. The AR contains hidden messages about Keong Mas's tale.
Shape	1. Illustrations are styled as "Kidult" - Kids-Adult, which combines kiddie style with flat-style illustration. 2. Stylization of 3 women characters. 3. Stylization of golden snails 4. Stylization of the river where the golden snail was found by the old lady.

Augmented Reality as Interactive Technology

As an emerging technology, Augmented Reality (AR) is part of the Virtual Environment that gives the user a picture of reality and virtual world mixture. There are 3 characteristics of AR, they are interactive, real time, and 3 dimensional [15] This technology overlays the digital object in the virtual environment into the real world through video, 2D / 3D images/ model, and audio as well. By implementing AR, the information can be gained more effectively and efficiently through mobile devices [16] In previous studies, AR technology has succeeded to improve effectiveness in learning cultural heritage by enhancing the visitors' experience. Hence, in this study, we use AR technology to attract younger generations in learning local culture by using mobile AR. Fig.1 shows the workflow of AR implementation using Artivive application.

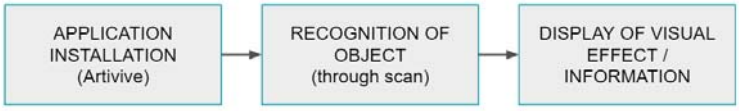

FIGURE 1. Workflow of AR implementation

RESULTS AND DISCUSSION

Stylization Process of Illustration Design

The selection of objects to be stylized was based on the real purpose of the folktale - which is to give moral lessons to the listener / reader. In the Keong Mas Tale, it is the jealousy that Galuh Ajeng feels towards Candra Kirana which destroyed everything. However, even though Candra Kirana was cursed by the witch, in the end kindness always wins. The spell was broken and Candra Kirana and her husband lived happily ever after. The author wants to give the message to the user : *"Jealousy and envy make people do evil things. However, kindness will always win."* Table 2 illustrates the design process of illustration of Keong Mas Tale characters.

TABLE 2. Illustration Design Process

Objects	Illustration	Description
Candra Kirana		In this illustration, Candra Kirana's hair is coloured **'Verdigris'** as it symbolizes **water, earth, and rebirth.** Candra Kirana was cursed into a golden snail and then she was dumped into a **river** and got back to being human after the spell was broken. Depicted with a crown, the author wants to show that Candra Kirana is the real princess.

Galuh Ajeng		In this illustration, Galuh Ajeng's hair is coloured blue to represent sadness and power. There is no crown worn by Galuh Ajeng to tell people that Galuh Ajeng was not the 'real princess'.
Wicked Witch		Wicked witch's depicted by an illustration of mirrored woman face- which means a two-faced lady, with black colour face to represent evil.
Golden Snail		The golden snail has 4 colours in it : orange (to create colour similar with gold), yellow (to represent the sparks of gold), verdigris (to show its relationship with Candra Kirana) and pink (the colour of the wicked witch's hair, to show the relationship of the snail and the wicked witch.
Sea		The sea is picturized by a wavy verdigris-coloured line to show that the golden snail (Candra Kirana) was dumped into the river. The river itself was part of Candra Kirana's life experience which brought her to become human again.

In the ATUMICS method, the only element that is used to create the products is C (Concept), which tells the story of Keong Mas Tale and the moral of the story. Meanwhile the other elements are transformed into modernity elements as explained in Table 1. Fig. 2 shows the ATUMICS method used in this design process. STUMI elements are transformed to modern element, meanwhile the Concept stayed the same. The concept (C) was adapted from the story Keong Mas in this study is the 3 women characters (Candra Kirana, Galuh Ajeng, and the wicked witch). We want to send the message to the user that the moral of Keong Mas story is there is no point in being jealous and doing bad things to people we are jealous of. However, the story is briefly explained with interesting animation so that good interaction can be built between the product and the user.

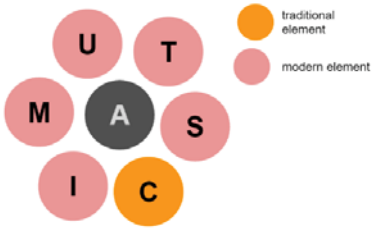

FIGURE 2. The use of ATUMICS method in designing

Fig. 3 shows the illustration printed on the product and scarf (left : illustration, middle : scarf, and right: totebag). The illustrations are scannable using mobile-app Artivive.

FIGURE 3. Keong Mas Illustration and the application of the illustration on fashion product

Augmented Reality Implementation on Fashion Products

The AR contains a brief version of Keong Mas tale, and it can be accessed by scanning the artwork/illustration on the fashion products like scarf and tote bags using Artivive Application. The process of creating AR to be implemented on fashion products are described as follows:

1) Animation Process from the illustration. This step is to animate the illustration and give information about Keong Mas Tale. We put the brief narration about the tale and animate it to make it attractive to the watcher.

2) Video and Figure Upload on Artivive. We used Artivive as the platform to connect the art on fashion products with the digital world.

3) Layering Process on Artivive. The layering process is to make the objects in the video look 3 dimensional. We also added background music that helps to build the ambience in the video.

Fig.4 shows the process of creating AR using on Artivive and the process of scanning artwork printed on the product (Tote bag and Scarf)

FIGURE 4. The Implementation of Augmented Reality on Fashion Product Design. (a) Process of AR creation includes Animation process and Uploading process on Artivive, , (b) Tote bag as product with scannable illustration (c) Scarf as product with scannable illustration.

Concept Testing Involving Potential Users

Once the product concepts are made, a small concept testing was done to test the products to potential users. This concept testing was done to gain the potential users' insights about the products and their interest towards them. The attributes were design, cultural purposes, and interaction. Most of the potential users give positive feedbacks about the design – the design was said to be fresh, young, trendy, and very fashion-forward. In terms of cultural purposes, many of them feel the augmented technology help them to engage more with the local culture implemented in the product, moreover, scanning a fashion product is considered new and they are curious about it. They agreed that the

combination of technology, local culture, and fashion can attract younger generation to know more about their local culture.

Fig. 5 shows that in the product, there were not only the product itself, but also elements of motivation existed. In this study, there were social motivation – which existed because the products are considered fashion items. Fashion items represent the social status of the wearer, and this also relates to how the wearer/user expresses themselves in social. Technology motivation existed since the younger generation pay more attention to new technology and it also broaden possibilities and attract more people using interactive media. Cultural motivation includes the potential users to feel responsible in preserving their cultural heritage and to understand more about their local culture.

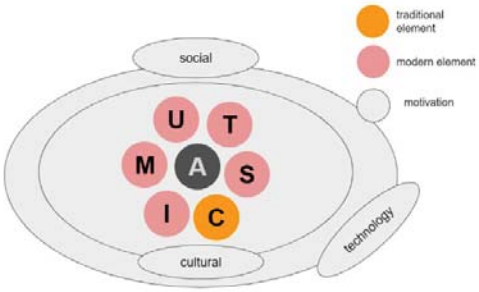

FIGURE 5. Elements of motivation existed in the product.

CONCLUSION

In this paper, a process of reviving Keong Mas Tale as one of Panji Tales in fashion products with AR has been presented. The study was done in the concern of preserving Indonesian culture and introducing them to younger generations, which in this study - Keong Mas Tale which happened to be one of the most famous folktales in Indonesia. To create a fashion product for the younger generation, we consider several aspects that can support the idea: design trends and technology that will help attract users to interact with the product. We used ATUMICS method in creating the illustration to be printed on the product, where we transform all elements except C(Concept) which is the original Keong Mas folktale. The products produced are scarves and tote bags which can be unisex, and the products contain illustrations that are able to be scanned - connected to augmented reality in their phones. When the users scanned the illustrations through their Mobile-App (Artivive), they would watch the animation video of Keong Mas tale with the illustration printed on the product. This way, the younger generation is interested more in local culture and this AR technology is making it even more possible to effectively support the users' experience in wearing the fashion products. The concept testing validates that the potential users (young generation) is attracted to the product, and they give positive feedbacks in terms of design and cultural purposes. Therefore, this study contributes to the preservation of one of the most important cultural heritage in Indonesia – the Panji Tale.

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Handy Wicaksono; Petrus Santoso; Indar Sugiarto; Dwi Kristiyono; Jonathan Aditya Wijaya

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