Visual Development Processes
for a Multicultural Storytelling Tool

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[Drawing and Video Games / Desenho e Videojogos]

Abstract

This paper presents the evolution of the visual development process for Mobeybou, a digital manipulative that aims at promoting multicultural awareness through creative storytelling. It presents children with a variety of characters, objects and landscapes from various cultures around the world. Here, we reflect on three different approaches of the visual development, and on how to effectively create visual elements that represent a given culture, which have the potential to foster the children's imagination and creativity. The first approach was carried out by a single illustrator and was mainly informed by research on the web. It was time efficient and resulted in the creation of visual elements that may have been too obvious. The second one took longer, had more input from other team members and often resorted to pop culture as reference; the resulting visual elements were easily identified by the children, probably because they depicted somewhat stereotyped representations. The third approach was a collaborative process from the start, that relied heavily on the opinions and insight of people who were born and raised in the country being represented. It resulted in a more complex relationship between the visuals and the culture they portrayed, which was potentially enriching for the viewer but may hamper the immediate identification of the culture.

1. Introduction

This paper presents the evolution of the visual development process for Mobeybou, a digital manipulative, that targets pre and primary school children and aims to foster the development of language and narrative competences, while promoting multicultural awareness, through creative storytelling. Digital manipulatives are objects with embedded computational properties that enable the manipulation of digital content (Resnick 1998). Mobeybou, uses physical blocks to interact with the digital content. The tool presents children with a variety of characters, objects and landscapes from various cultures around the world. Consequently, it fosters the creation of multicultural narratives and empowers children with diverse cultural backgrounds to create and share their own stories [1].

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Mobeybou is composed of an electronic board that connects to a computer via USB, and a set of physical blocks, which can be placed on the board to trigger the respective visualization on the device's screen. The narratives unfold according to the combination of blocks that are placed on the board. So far, we have developed three sets of blocks, representing the cultures of India, China and Brazil. Each set is composed of seven elements: two protagonists (a boy and a girl), an animal, a mythical creature (who serves as the antagonist in the narrative), a landscape, a musical instrument and a magical object. These elements are representative of native components of the country or are inspired by the folklore, traditions and mythology of the culture. There is also a separate group of blocks that represent atmospheric conditions (night, snow, storm, rainbow, wind and rain), which affect the environment of the story (e.g. the rain block triggers a rain effect on the device's screen). The children can mix and match the various elements from the different cultures to create unique stories of their own. The experience of intertwined cultural elements potentially promotes multiculturalism, as children visualize how rich – both visual and content-wise – the intercultural experience can be.

At the same time, we are developing a complementary app about each country and its culture, so that the children can learn more about the elements present in the digital manipulative. The app presents a story and small games for each country, that reference the meaning behind the characters and the objects present in the storytelling tool; thus, adding value to the whole of the multicultural experience.

The present work is a reflection on three different approaches to the process of visual development, i.e. the creation of all visual elements that constitute the digital component of the tool. Here, we reflect upon the development process in order to understand how can we represent and honor a country and its culture, with such a limited number of elements, on a limited time frame, considering animation restrictions, without resorting to stereotypes and clichés.

2. Different Approaches to the Visual Development Process

2.1. The Development of the Indian Visual Elements

The Indian set was the first to be created (see Fig. 1), its development process represents the first design approach, which was carried out in a short period of time by a single illustrator. The creation of the set began with an online research of the Indian country, which included the search for traditional tales, customs and food, main religions, geographical information and common cultural practices that were unique to India; all accompanied by abundant visual references[5]. A selection process took place to decide which information could be used to compose the final group of seven elements. There were very few initial sketches and the final design was achieved quickly. The final versions were then presented to the team;

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5 This is common practice for the visual development phase, as is described, for example in *The Art of Brave* [2] -– the artists carried out research trips to Scotland to gather information and visual references for their story – and in *The Art of Tangled* [3] – the artists gathered information and visual references of medieval Europe and were inspired by other artworks that referred to their theme.
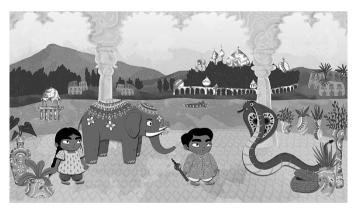
up until this moment, the illustrator worked virtually alone. The team decided on a few small alterations and all the elements were optimized for the animation process. The Indian set helped to establish a look that would guide the creation of the next sets.

This first approach was quick and effective, relying solely on the research made by an individual, whose choices were inevitably influenced by biases and predetermined ideas about the country and its culture. This resulted in visuals that have a strong connection to the traditional – and perhaps stereotyped – aspects of India.

The Indian animal, whom we named Hati, is an elephant whose design was inspired by the decorated animals of the Elephant Festival in Jaipur [4]. Elephants have long been revered in India; Ganesha, the Hindu god with an elephant head, is one of the most known and worshiped deities across Asia; kings appeared mounted on adorned elephants to dazzle their subjects and affirm their power [4]. However, painting and parading elephants has also been associated with ethical questions about the mistreatment of these animals [4, 5].

The Indian antagonist Nagi (meaning the female *naga*) was based on the legend of *nagas* – semi divine beings of Indian mythology that can shapeshift between human and serpent form [6]. These mythical creatures are potentially dangerous, but often beneficial to humans, and appear frequently as door guardians of temples. Nagi's design depicts a colorful cobra, who does not transform itself, that looks both, menacing and fun.

Fig. 1. India's group of elements and the pattern that we have created and associated with it.

The first idea for the Indian musical instrument was a sitar[6], but due to animation constraints, it was decided that we would use a *pungi* instead, since it is smaller and easier to equip on the characters. A *pungi* is an Indian flute made from a gourd that is mainly associated with snake charmers. This is considered an ancient practice that involved housing a snake in a basket and playing the *pungi*, making it look like the snake was transfixed on the instrument. However, as it is done today, snake charming may involve animal cruelty and has been targeted by laws prohibiting the possession of snakes [7].

6 A sitar is a long-plucked string instrument that is played sitting on the floor.

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The Indian object is a pair of *jutti* – shoes crafted in leather with extensive embroidery work, made with gold and silver thread [8]. When equipped on a character, the *juttis* make him/her float. This effect is not directly related to the history of the object; in fact, the idea came from preliminary studies that were done with a group of 3rd graders [1], who suggested this particular interaction.

Meera, the Indian female protagonist, has a long black braid, wears a red *bindi* on her forehead and a *shalwar kameez* – a garment consisting of a tunic and loose trousers that narrow at the ankle. Traditionally, women would also wear a *dupatta* – a light fabric scarf; however, it was not included in the design. Rajesh, the male protagonist, also has black hair and wears the same *shalwar* (loose trousers) with a *kurta* (a collarless shirt). In order to optimize the animation process, the two characters' garments have the exact same silhouette. Although the top garments should realistically have different lengths, their current design allowed the animator to create a single animation that was applied to both.

The Indian landscape was inspired by photographs of Indian palaces, with ornamented columns and tiled floors. Some of the landscape elements are decorated with a pattern that are depicted on Rajesh's tunic, similar to the decorations on the *pungi* and on Hati's back.

2.2. The Development of the Chinese Visual Elements

The second set we created was the Chinese (see Fig. 2), which took longer and had more input from the other team members. The initial research was done, as explained before, resorting to children's books and movies as inspiration. Although most final designs were achieved quickly, there was a more extensive exploration of visual options than before.

The design of the Chinese animal – Gugu, a giant panda – was the element that took the longest to be completed. We tried out several initial sketches, representing different possibilities of shape and size, and the final design emerged out of a collaborative process. The giant panda is a Chinese native animal, whose conservation status is currently vulnerable; meaning pandas remain scattered and low-numbered in the wild [9]. Gugu's presence in the story world will potentially create an even stronger empathy towards this world-wide loved animal and allow children to learn more about the species, through the interactive app. The only embellishments on Gugu's body are discreet yellow lines around its paws. However, next to the other characters' in the group it did not stand out, so we added a red conical hat, with yellow details. This type of hat is present all over Asia, being a useful tool to keep laboring people in rice paddies protected from the sun and rain [10]. The conical hat has been used in film and other media to imply an ethnic type, connoting a vague representation of people of Asian origins, but often associated with Vietnam and the laboring peasant class. It is an element present in animation movies like the *Kung Fu Panda* trilogy [11, 12, 13] (Po, Crane and half the panda village use them); but also, in live-action movies, like *Big Trouble in Little China* [14].

It was decided that all the protagonists would have the same general design, as a way to make production more efficient and to allow the children who use the tool to immediately identify them. This accelerated and facilitated the process of designing Xiao Li (the Chinese female character) and Ju Long (the Chinese male character), who besides having a similar design to their Indian counterparts, have the exact same silhouette as one another. They both have black straight hair and pale white skin. Xiao Li has her hair in two buns, a hairstyle commonly called ox horns. This hairstyle was widely popularized by pop culture characters like Chun Li (from *Street Fighter* [16]).

The characters' attire was inspired by traditional clothing items like the *cheongsam* – a fitting dress worn by women – and the *changshan* – a dress or tunic worn by men. The combination of a straight-cut loosed-sleeve tunic with dark pants and shoes was inspired by the garments of famous Bruce Lee movie characters [17, 18]. We chose shades of red for the protagonists' clothing since it was a color that appeared frequently in our research; often connected to Chinese New Year's traditions.

The Chinese antagonist is Nian, a fire-spitting red creature, that resembles the flat-faced lion statues guarding Chinese Buddhist temples, as well as the papier-mâché costumes of the traditional lion dance, usually performed by a pair of acrobatic Kung Fu students [19:114]. The legend that inspired the creation of our character tells the story of a creature who would come down from the mountains, every year, to devour people from the village and damage their crops. There are different accounts of the legend: some say the monster was lion-like and was scared away with loud noises, fire and the color red [20, 21]; others say the villagers created a lion costume with paper and bamboo that was used to scare the creature away [19:114]. These legends explain the beginning of Chinese New Year's traditions, like the fireworks and the use of red garments – referenced in our character through its fiery nature and look.

The Chinese musical instrument we chose is a *pipa*, a short-necked Chinese lute. The *pipa*'s size and shape make it a good option to overcome animation restrictions. Its design was kept simple; the only addition being the scale pattern on its wooden body. This pattern is repeated in Xiao Li's

Fig. 2. China's group of elements and some of Xiao Li's outfit iterations.

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tunic, in Nian's body, in Gugu's hat and in some elements of the landscape. The pattern repetition creates a visual cue that helps to identify which elements are from the same culture.

The Chinese object is the hand fan; it is still used today in dance, martial art performances and as a decorative item. Through time, hand fans evolved from simple accessory to artwork, and were used as canvases for poems, calligraphy, painting and embroidery [22]. They have also been popularized as martial arts accessories and weapons, by characters such as Kitana (from *Mortal Kombat* [15]). In the story world, the fan is used to protect the protagonists, similarly to a weapon, by creating a hurricane that knocks out the antagonists. The idea for this effect also came from the preliminary studies with children. The design of the fan is simple: red with a yellow dragon; in the same color palette as the other Chinese elements. We chose to depict a dragon because it is an inseparable symbol of the Chinese culture: from the zodiac sign to the dragon dance, it is a symbol of auspiciousness and prosperity present in Chinese legends, festivals and art throughout the world [23, 24].

This group's landscape was inspired by Chinese paintings, as the ones done by landscape artists such as Zhan Ziqian, Fan Kuan and Qi Baishi, whose works often depict top-rounded tall mountains near lakes or rivers – much like the landscapes one would find at Yangshuo County, another one of our visual references. We decorated the landscape with houses, red paper lanterns and common Chinese plants, like bamboo and *pilea peperomioides* – also known as Chinese money plant.

2.3. The Development of the Brazilian Visual Elements

The third and most recent set we have worked on was the Brazilian (see Fig.3). The approach to the development of the Brazilian elements was different from the two previously mentioned, as two members of the team were born and lived in Brazil, which made this approach to the visual development a collaborative process from the start. There was a period of individual research, but the design choices relied heavily on the Brazilian members' opinions and insight. Most elements of the set went through dozens of iterations and the team gathered every day to discuss them. This made the process much slower than the previous approaches and led the illustrator to create a much greater volume of work.

When creating the design of this group's protagonists, we considered the fact that, despite the great ethnic and racial variety in Brazil, the majority of the population (54.9% out of approximately 205 million people [25]) identify themselves as being *pardo*[7] or "black". This prompted us to use a darker skin color for the human characters. However, to further highlight Brazil's ethnic diversity, we chose a different skin tone for each protagonist, and so Kauê (the Brazilian male protagonist) is darker-skinned than Iara (his female counterpart); both their names derive from indigenous traditions. They both have curly hair, since this is a common phenotype in Brazil.

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7 *Pardo* is an adjective used to describe something of undefined color, between yellow and brown shades, often used as a synonym of *mulato* – someone with brown skin, descent of parents of different ethnicities, e.g. Caucasian mother and black father, or vice-versa.
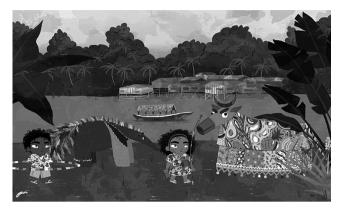
Fig. 3. Brazil's group of elements and initial iterations of Tatá.

We did not design the Brazilian protagonists wearing traditional folkloric costumes because the Brazilian members of our team thought it would be unrepresentative of their culture, since traditions vary widely across the country (this argument could be applied to the other two countries, India and China, with the latter being even bigger than Brazil, but we did not have the knowledge or insight to pursue this question further when we designed the elements for the previous groups). We also rejected the idea of dressing them as natives from the Amazonian forest; either option would narrow the rich multicultural diversity of Brazil, according to the members of our team, who were forceful in defending a less segregated or stereotyped view of Brazilian culture. They then suggested that we should dress the protagonists in contemporary summer clothes, like t-shirt, shorts, dress and flip-flop sandals, in bright colorful patterns. The patterns we created depict some of the country's most well-known tropical fruits, like *guaraná*, pineapple, banana and papaya. These design choices are aligned with the motto of one of the country's most famous brand, *Havaianas*, for it embodies "Brazil's fun, vibrant & spontaneous way of life" [26].

Following the line of thought that led us to create summer wear for the protagonists, we created a beach landscape, an inevitable association made with Brazil. However, after some team discussions and by suggestion of the Brazilian team members, we developed a second option that represented a Northern Brazilian scenario, near the Amazon forest. It depicts the rain forest, a river, a boat and *palafitas*. These are "floating houses" made of wood-suspended frames, that stand on flooded soils or rivers; therefore, common in the regions of the Amazon basin [27].

The antagonist of this group is a *boi-de-mamão*, a character from oral Brazilian traditions, that is known across the country by different names, like *bumba-meu-boi* or *boi-bumbá*. This creature, who resembles an ox, gives the name to a Brazilian folkloric dance, influenced by African, Indigenous and European traditions [28]. The dance is associated with several religious festivals that take place in June, where people build a colorful *boi-de-mamão* costume with papier-mâché and pieces of fabric, which is used by a dancer in theatrical and dance representations of this folkloric tradition. There are different legends about this character that vary from region to region;

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nonetheless, the ox is often depicted as a figure who dies and is later reborn. Our design of the *boi-de-mamão* is very colorful, with an air of madness, to make it fun. There are no legs visible under the cloth that constitutes the body of the character, so it looks like it floats. However, when it is hit by a lightning strike in the interactive platform[8], it shows the skeletons of people underneath the costume; referencing the origin of the character.

The Brazilian musical instrument is a *berimbau*, a "musical bow" consisting of a long piece of wood, a single string of steel and a small gourd; it is played with an additional small rock or coin and a thin wooden stick [29]. Despite its African origin, the *berimbau* is typically associated with the state of Bahia and the practice of *capoeira*, a Brazilian cultural expression as ancient as slavery, that is simultaneously a dance, a fight and a game, involving music [30].

Bambolê – a hula hoop - is the object chosen for the Brazilian group. Variations of the hula hoop have been around for centuries – going back to Ancient Greece and Roman Empire; however, the hula hoop, as we know it today, was trademarked and popularized by Wham-O, an American toy company, in the late 1950's [31]. Because this is not an object typically associated with Brazil or of any traditional value to the Brazilian culture, other options were suggested by the team, like a *peteca*[9] or a Carnival mask, which were more obvious associations. However, the Brazilian members of the team were adamant in including the *bambolê*. They argued it was still a very popular toy in their country and it expressed play-fulness, as well as the importance of dance in Brazilian culture. When the *bambolê* is used in the tool, a protagonist twirls it around their waist and it releases confetti; a reference to the celebrations of Carnival in Brazil.

Tatá is the name of the animal of this group – a giant anteater[10] – native to Central and South America and one of the species living in the protected area of Pantanal, a wetland region that extends from Brazil to Bolivia and Paraguay. This choice was made based on its uncommon look and exotic-ness. Tatá's design had the biggest number of iterations. It was a challenge to work with its original dark browns and grays, because the other elements had such vibrant colors. We finally decided to create a colorful mane and tail; adding an anklet – a summery accessory, often sold near beaches.

2.4. Arguments for and Against each Design Approach

The process of developing the Indian visual elements was fast; but because it didn't originate from a collaborative work and the illustrator based the designs on information gathered online, the designs reflect a somewhat stereotyped representation of India. The choice of elements was perhaps too obvious, fruit of a shallow and distant research: due to the ignorance on our side, we could only rely on accounts found online and our own in-terpretation of them. Designing these elements posed a challenge because

8 The storm block of the tool triggers a lightning storm on the screen. Characters present on the screen will be randomly hit by lightning strikes, which shows their skeletons for brief seconds.

9 The name of the shuttlecock used in a traditional indigenous Brazilian sport, of the same name.

10 In Portuguese, it is called *tamanduá-de-bandeira*; we shortened it to Tatá.

of the moral issues some of them provoked, related to ancient practices that are now being abolished and rethought by the Indian government, in a pursuit for contemporaneity and development. Despite this overall negative self-assessment, the children who experimented with the tool (and whose knowledge of geography is almost inexistent) enjoyed the characters and some could even identify the culture by looking at the them [1].

The process of developing the Chinese elements was slower and involved more collaborative work, which resulted in more thoughtful decisions; however, the final designs still represent clichés. We believe this is mainly due to the influence of Chinese representations in pop culture and visual media that we accessed. These stereotypical representations leave an indelible mark on our collective brain, making it difficult to disassociate certain symbols from the culture and looking further for better and deeper representation. The influence of Kung Fu movies and East Asian games and animation references are visible in our designs. The truth is that the Chinese group was quickly and easily identified by the 3rd graders in the preliminary studies [1].

The process of developing the Brazilian elements was much slower than the previous two and involved a much more collaborative approach, as explained above. The insights given by the Brazilian team members changed our perspective on designing the elements: it was no longer about tradition and stereotypes already seen in pop culture; it was about authenticity, contemporaneity and diversity. The visual elements have a more complex relationship with the country they are representing, making the connection less obvious. This may make it more difficult for children to identify the culture being represented; as there is no direct link between these elements and what we would usually see as representing Brazil on mass media – like football, *favelas* or Carnival parades.

3. Conclusion and Future Work

The research question formulated in the beginning of this paper brought forward answers that are not definitive nor are they rules easily applied to similar projects. This opportunity for reflection made clear that representing a culture is a delicate endeavor, that will almost certainly leave out important aspects of its identity. We bear in mind that any process of representation of identities, which inevitably simplifies and homogenizes a culture – since cultures are never unitary in themselves – happens through an alienation of the complexities of the culture [32]. However, it is not within the scope of our project to show an extensive and comprehensive representation of each country's individuality. We aim instead to create story elements that will entice children's imagination and captivate their attention and curiosity, so that they can start a dialogue, and later learn more about the world.

Our research team progressively adopted a creative process based on exploration, collaboration and iteration. This analysis showed that collaborative work is of the utmost importance to achieve satisfactory results. The individualistic approach led to shallow and stereotyped representations, that were achieved in a short period of time and that were easily identified by the children; while collaboration led to discus-

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sions and deeper research to support claims, taking longer to achieve the final designs. Still, it was not enough to achieve non-stereotyped representations, because of the natural distance we had between us and those foreign countries. It can be difficult to empathize with the perspectives of individuals from a culture beyond our first-hand experience [33], which can hamper the process of designing for an international target-audience, as well as the process of representing the culture of others.

The key factor, we believe, to creating visuals that are more interesting and connect to their context at other levels is to work with people born and raised in that culture. Research will lead us through traditional and folkloric representations, while people who have a close relationship with the culture will show us different aspects of the country's identity. It results in a more complex representation that asks more of its viewer. However, we have to be aware of a generalization problem, that can happen if we regard a small group of people as being representative of the majority within a culture [33]. To prevent this, we could consult with bigger groups of people from a given culture, to get a wider scope of perspectives and opinions.

Given the purpose of our work – which is to foster the improvement of language and narrative competences, while promoting multicultural awareness through creative storytelling – we need to balance the stereotypical and the new forms of representation. It is important that the children can identify the culture being depicted, while at the same time, being confronted with new knowledge that will entice their curiosity and show them different aspects of that culture. We will continue to strive to attain a model of workflow that allows us to accomplish this goal, repeatedly, with each culture we incorporate in the digital manipulative.

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