# Incorporating Fictionality into the Real World with Transmedia Storytelling

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**Abstract.** Ubiquitous computing technologies now offer attractive possibilities to embed fictionality in the real world. This opens a new arena to navigate human behavior. Virtual forms representing fictionality and incorporated into our daily artifacts and media will become an infrastructure for navigating human behavior through the incorporated fictionality. In this paper, we describe two topics towards the realization of such a goal. The first topic presents that transmedia storytelling is a promising technique to incorporate fictionality into the real world. The second topic shows that the value-based analysis framework is a promising tool to analyze a sense of reality on the fictionality embedded into the real world and the reality is essential to make human behavior navigation successful. We present two case studies to demonstrate the effectiveness of our approach.

**Keywords:** Fictionality · Transmedia storytelling · Human behavior navigation · Value-based analysis framework · Reality · Ideology · Metapore

## 1 Introduction

Navigating human behavior is essential to solve various serious social problems. For example, achieving social sustainability cannot be solved only by technologies, and it is essential that people alter their attitude and behavior [16]. Information technologies are effective to navigate human behavior towards better lifestyle [19]. Ubiquitous computing technologies enable us to incorporate fictionality into the real world through virtual forms that draw computer generated dynamic visual information [21]. Specifically, a concept named procedural rhetoric make the persuasiveness of the visual information more powerful [2]. Transmedia storytelling [3, 14] is a useful tool to incorporate the fictionality in the real world though a network of virtual forms embedded in the real world, where transmedia storytelling allows the fictional stories to be fragmented into several different media distributed in the real world. Virtual forms are considered as a desirable infrastructure to incorporate fictionality represented as transmedia storytelling into the real world [19].

In video games, players enjoy the fictional world through the real world interaction [7]. Game studies scholars introduce a term called *magic circle* [5] where a player plays a game inside a *magic circle* that is not recognized in the real world. However, incorporating fictional worlds in the real world needs to be indistinct between inside and outside of the *magic circle*. *Virtual forms* will be interfaces between the real world and

fictional world and we believe that transmedia storytelling is a promising way to design the interface.

Fictional stories may contain ideological messages that make us aware of the important social issues while we are living in the daily life [22]. Specifically, Japanese popular culture such as games and animations offers tremendous examples including ideological messages to increase the tension in the drama [20]. When a character or an item appeared in the fictional stories is presented on *virtual forms*, the character or good can be used as a leitmotif of the stories to remind these ideological messages and they make navigating human behavior more effective [19].

In order to incorporate fictionality into the real world for navigating human behavior, a feeling of reality is essential because a people lose a sense of the immersion if they do not feel the reality on visual images that *virtual forms* draw on. However, there is currently no good methodology to discuss how to assess a sense of reality on the fictionality represented as transmedia storytelling. The *value-based analysis framework* is a promising tool to discuss how visual image represented on *virtual forms* offer a sense of reality. Ubiquitous computing technologies allow us to embed *virtual forms* into our daily artifacts surrounding us [15]. For example, augmented reality technologies by using micro projectors easily add a virtual layer on our real world. The framework allows us to design more effective *virtual forms* and how to embed them in our daily artifacts in our surrounding environment.

In this paper, we show two case studies that incorporate fictionality in the real world through transmedia storytelling. The case studies make the boundary between a real word and a fictional world blurred. The first case study is to explicitly use social media to incorporate fictionality in the real world. When observing several fictional events occurred in the fictional world through social media in the real world, the reality of the fictional event is increased. The second case study is to blur the boundary between a fictional world and a real world by mixing the scene and event in a real world into a fictional world. In particular, by using real scenes of the real world in a fictional world, people feel that they are staying in a fictional world even if they visit to the real world. After introducing the overview of the case studies, we analyze them with the *value-based analysis framework*, and show that the framework is a promising tool to assess a sense of reality on the fictionality incorporated into the real world.

The remaining sections are structured as follows. Section 2 presents how ideological messages are incorporated into fictional stories. In Sect. 3, we show that a virtual character used in fictional stories can be used as a leitmotif to remind the ideological message. This is very important to present fictional stories on virtual forms and navigate people's attitude and behavior to solve serious social issues. The Sect. 4 introduces the *value-based analysis framework* and Sect. 5 discusses how a sense of reality is increased when incorporating fictionality in the real world. In Sect. 6, we show two case studies and analyze their reality with the *value-based analysis framework*. Section 7 summarizes the paper.

## 2    Fictional Stories and Ideological Value

The story already plays an important role in product advertisements because it increases the appeal of the target product [8]. Using fictionality to incorporate stories makes our

experiences richer because the stories can translate the meaning of the visual representation on virtual forms more easily. Fictional stories are particularly useful tools for enhancing our daily experiences for increasing our buying impulse. Fictional stories can represent stories that do not exist in the real world or stories from the future. The stories can flexibly offer us a broad range of information using nonexistent artifacts such as magic. It is easy to embed ideological messages in these stories and make it possible to teach about various social issues. Additionally, the stories are useful to encourage a user to alter his/her undesirable behavior and attitude because their positivity can be used to increase people's self-efficacy.

Many Japanese fictional animation and game stories like *Yu-Gi-Oh!* animation story [28] typically contain serious ideological messages that are important and that make our daily life more desirable. We believe that this observation is very important to use the fictional stories as a tool to incorporate the ideological value to the real world. In particular, the ideological messages can be used to alter a user's attitude and behavior [18, 19]. However, only incorporating the ideological messages does not alter a user's attitude and behavior. Also, a user's intrinsic motivation should be developed towards his/ her behavior and attitude changes.

## 3   Virtual Characters as the Leitmotif of Ideological Message

Currently, virtual characters are widely used in our daily life. For example, famous *Disney* characters such as *Mickey Mouse* and *Donald Duck* provoke empathetic feelings easily, anytime and anywhere, and *Hello Kitty* and *Pokémon* are now found all over the world [1]. In animations and games, each virtual character has its own personality and story, which can be used as a medium to convey special information and messages to people. If people are familiar with the fictional story behind an animation or a game, then the story's characters will easily recall the leitmotif of the story without requiring much additional information beyond just an action or an interaction with the story's characters. Specifically, many Japanese animated and game stories contain serious ideological messages that are important and that make our daily life more desirable. We believe that this observation is very important when considering how to use virtual characters in various future real world information services. Currently, our daily life is becoming increasingly complex, and we need to manage significant information every day. In our modern society, there are many real social problems that need to be solved urgently, but it is hard to convey important ideological messages to people without presenting a large amount of additional information to them. For example, education is a traditional heavy-weighted method to teach the importance of ideological messages, which takes a long time to learn.

In the contemporary Japanese society, several posters for public service announcements have adopted the idea to use virtual characters from recent popular animation stories. For example, *K-ON!* has been used for promoting a national survey in Japan [29]. In the story of *K-ON!*, high school girls try to realize their dreams with cooperative efforts among them. This becomes a persuasive message conveying the idea that everyone's participation is important for the national survey. NFGD that

promotes guide dogs' training has created two posters using popular characters from *Puella Magi Madoka Magica* [26]. The girl that has been used in one of the posters is rebellious, but very considerate to her friends. The girl used in the other poster is very close to her friend and keeps thinking and caring of her friend even when they are far from each other. Many young girls admire these two girls, nowadays. If people want to imitate these magic girls, then the posters contain the implicit, strong persuasive message that becoming a puppy walker is one of the ways to become like them. The example shows the effectiveness of using virtual characters that have their background stories to attract people. It is good evidence that virtual characters could be used to convey ideological messages that might play significant role in changing people's current attitude. In Japan, the majority of young people have been enjoying animation and game stories for a long time and they know the popular animation and game characters and their stories very well. This we believe is a good prerequisite for using virtual characters to enhance emotional feelings and successfully convey ideological messages through the characters' stories.

## 4   Value-Based Analysis Framework for Increasing a User's Intrinsic Motivation

Figure 1 shows our basic approach to using the six values proposed in [15, 18] to increase people's intrinsic motivation. These values were extracted from experiences with building several smart artifacts incorporating *virtual forms*. The values are a useful design tool to design products and services. After presenting a brief overview of the framework, we show how the values can be used to incorporate fictionality in the real world.

The first value is the *informative value*. This value offers sufficient information to the user and helps him/her to make a better decision. A typical example is an augmented reality service that superimposes useful information on a video. The service provides the user with detailed information about his/her daily environment such as shopping information and route information.

The second value is the *empathetic value*. This value is achieved and enhanced by adding some similarity with a user. It is usual that a person has strong empathy on another person when they have some similarity between them. As described in [13], a user can feel a close relationship with even a product which has some similarities with the users.

The third value is the *economic value*. This value provides the user with a sense of ownership. In particular, physical tangibility is important for increasing the sense of ownership of an object. For example, people like to possess expensive jewelry or artwork. The rarity is a key to increase the sense of ownership, and collecting rare objects also increases the social status of the user. The sense of ownership of an object is very important for allowing a user to create his/her own original "empathetic story" with the object; this story describes the user's feelings and attachment to the object and how the user's daily life has changed once he/she possessed the object.

The fourth value is the *aesthetic value*. Aesthetics is an important concept to make daily objects more attractive. Aesthetics is a branch of philosophy addressing the nature
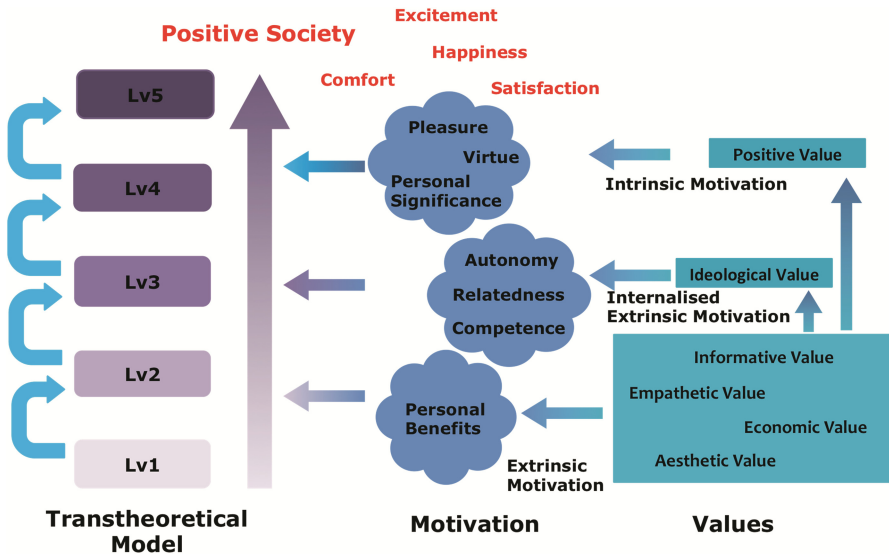
**Fig. 1.** Enhanced value-based analysis framework

of art, beauty, and taste, particularly the creation and appreciation of beauty. For example, Japanese traditional folk crafts represent aesthetic values, which are always very important for increasing our quality of life.

The fifth value is the *positive value*. The positive value increases their happiness, excitement, satisfaction and comfort, and stimulates their positive emotion through pleasure, personal significance and virtue [4]. This *positive value* also increases people' feelings of competence that increases human intrinsic motivation to change their attitudes and behaviours; it also helps them maintain their changes.

The final and sixth value is the *ideological value*. This value reminds a user of important ideological concepts, such as friendship, justice and so on. This value is not explicitly presented to a user, but special stories carrying important ideological messages are used to implicitly explain the importance of these concepts. If a user knows the stories, then the characters appearing in the stories can be used as metaphors to demonstrate the ideological value.

The *empathetic*, *economic*, and *aesthetic values* offer people extrinsic incentives, and the *informative value* provides reasons to change attitude or tips and tactics for making better decisions. Our framework is based on the *transtheoretical model* [12], which is a psychological model for changing people's attitudes. These four values are used as tools in the model to change the user's current behavior by reminding him/her of the importance of changing his/her behavior and encouraging this change at an early stage. The *ideological value*, however, makes people's dreams and expectations explicit and teaches the user how to change his/her attitude to realize his/her dream. The *positive value* increases people's self-efficacy to realize their dreams. These values are used to increase the intrinsic motivation of the user to change his/her attitude in the latter stage of the *transtheoretical model*.

The combination of extrinsic motivation, *ideological values* and *positive values* strongly enhances the intrinsic motivation and changes people's way of thinking. At first, the four values are used to increase the user' extrinsic motivation, but after the user understands the ideological messages, which are represented as the ideological value in the stories, the *positive value* convinces him/her to achieve the ideological message in the real world through the association of the real world and the virtual world in the fictional story. In this step, the *positive value* changes the extrinsic motivation of the four values into intrinsic motivation. For example, playing against a favorite virtual character becomes the player's extrinsic motivation. However, after gaining an understanding of the background story of the character, the empathy for the character can drive intrinsic motivation because the user now knows how the character tries to realize the ideological message in the fictional story.

As described in Sect. 3, a virtual character can be used as a leitmotif of a fictional story. The value based analysis framework suggests that virtual characters or items can be considered as a leitmotif of a fictional story offering the ideological messages. The empathetic and aesthetic values are especially useful to attract people. Usually, people remember virtual characters or items that offer *empathetic* or *aesthetic value* well. Therefore, if these virtual characters or items appear in the real world, people also remember their stories. If the stories contain strong ideological messages, the characters remind these ideological messages in the real world as well. This effect is called the *priming effect* that is an implicit memory effect in which exposure to a stimulus influences a response to a later stimulus. If the rare items in the fictional stories appear in the real world, this is also used as the priming effect.

When the framework is used to increase a feeling regarding the reality of a fictional story, we need to consider how the value is investigated in the fictional story. Then, we discuss how the value in the story is consistent with the value in the real world. For example, the *empathetic value* is increased by the use of an attractive virtual character from a fictional story. If the character is shown in the real world through the use of an augmented reality technology, the *empathetic value* is also increased in the real world. When the same aesthetic scene is shown in both the fictional and the real world, the *aesthetic value* increases the belief in the reality of the fictional world. The *economic value* is increased when the item appearing in a fictional story appears also in the real world, and many people think that they would like to own the item in the real world. A mission in a fictional story can be achieved by contributing funds in the real world. The *informative value* increases if some information related to a fictional story is shown in the real world and the information cannot be distinguished from the factual information. The fictional story may be fragmented into several media and they are distributed in the real world when transmedia storytelling is used. Some of the information appears on the Web, and the user is not aware that it is a fake Web site that presents a fictional story not a real story. The *positive value* and *ideological value* increase the reality if the primary message of the fictional story is related to a serious social problem in the real world. For example, if the message is related to social sustainability in a fictional world, the mission to achieve sustainability in the real world is also encouraged [22].

## 5    Achieving Reality When Incorporating Fictional Stories

It is a very important issue to consider how to obtain and keep the reality in the real world [17, 22]. Even if fictional stories are incorporated, the *virtual forms* should convey their realities to users. In particular, if a fictional story is embedded in the real world, the reality in the story shown on the *virtual forms* is essential. For example, a person, who has frequently watched animation movies, does something in the real world, feels that adding popular virtual characters from the animation into the real world makes it more enjoyable and exciting. The desire to follow these characters becomes also an incentive for him or her to alter his or her behavior. A negative feedback may be used to stop immoral play, but altering a user's attitude in general is not easy [11]. The most important insight is that there is a possibility to use a virtual character as a metaphor that recalls the story of the character in the player's mind while gaming, and in this way the story may convey the leitmotif containing ideological concepts like the importance of friendship, honesty, justice, thoughtfulness and so on as described in Sect. 3. In the real world, characters and key items in the animation story are incorporated, but the animation story may not explicitly shown during his or her actions. The person needs to recall himself/herself the story during his/her play. More tight integration of the daily behavior and the animation story offers a possibility to design new transmedia storytelling. The movement of a virtual character from the fictional world to the real world offers a tight integration between a fictional story and a game. This approach makes a stronger association between a story in the fictional world and the real world through a virtual character than the current approach, and the boundary between the two worlds becomes more blurred. This approach would have the power to alter the people's attitude and behavior.

Past experiments show that the reality of the characters, such as facial expressions, movement and behavior, is essential to increase the enjoyment of our daily activities [18, 21]. Reality is an important criterion to evaluate a design. In our case, the virtual character's behavior should be consistent with the character's behavior in the animation story and this is important to feel the reality in the game. For example, items that are not used by the character in the animation should not be used in the real world as well, and the movement of the virtual character in the real world should be consistent with its typical movement in the animation. The number of items owned by the character should be consistent with the real game situation as well. Too realistic expressions, however, may cause the *uncanny valley* problem [10] if we can perceive that the achieved reality is not completely realistic.

One of the most important design issues is that the *virtual form* should be natural like traditional real materials. However, the *virtual form* may exaggerate the effect in the real world, which might make the *virtual form* even more exciting and attractive to the user than the original one. A feeling of the reality is important so that a user continues to enjoy the fictionality embedded into the real world for a long time. It is, however, hard to say and define, when and how a user feels the reality on an expression presented in a *virtual form*. It is not just enough to make the *virtual form* as close as possible to the realistic expression because a user may not feel the reality

or may not be satisfied or attracted by extremely realistic expression. A user sometimes feels the reality to unrealistic, exaggerated expressions or to expressions that include reality elements partially. It is an important issue to investigate the question of how a user feels the reality in a next step of our research.

There are also a couple of issues to be considered in terms of the reality. The first important issue is that there should be a proper reason why the items and characters exist in our world for increasing the reality of a user's experience. There should be a plausible reason why a virtual character is appeared in the real world. The second important issue is that the behavior of the items and characters should be consistent with their behavior in the fictional world. In particular, if a user is familiar with the fictional story, this issue is very important [22]. There is also an alternative way to increase the reality of the fictional world by adding the interaction in the real world [19]. If there is an interaction between a user and a fictional story, he or she can create more engagement on the story. This is a reason why we usually have more engagement on gaming than watching animations. Users feel the reality of the fictional story because their intervention has strong influence on the story. If the reality is lost, a user's experience is just like watching a story that is unrelated to the user's daily life. Then, the relationship with the real world is also lost, and the user's engagement is also decreased.

## 6   Fictional Stories in the Real World

Alternative Reality Games (ARG) [9, 23] are a promising approach for conveying messages to users using multiple channels. Fictional stories are embedded into a game that is played in the real world and that uses multiple channels. The channels offered in the game are used to exploit the game's fictional story. For example, in *Perplex City* [27] trading cards are used to introduce the characters and the story. Web sites, emails, phone calls, and SMS messages are then cooperatively used to solve riddles in the mystery story. Because the media is tightly integrated with our daily activities, we feel that the fictional story is realistic. For example, social media such as *Twitter* and *Facebook* have become very popular. Thus, fictional stories that are embedded in social media increase the feeling that the stories are occurring in the real world. The form to represent a story affects the way an ideological message is conveyed to a user. The transmedia storytelling divides a story across multiple media so that it is possible to choose the most suitable form to attract a user and to convey a message to him/her.

Theme parks with entertainment attractions, rides, and other events in a location are designed to be enjoyed by a large number of people. A theme park is more elaborate than a simple city park or playground and usually provides attractions that are meant to target particular age groups, although some are aimed towards all ages. A theme park is a typical way to integrate fictional stories into our activities in the real world. *Disneyland* is a typical and the most famous theme park. Many *Disney* characters appear in Disneyland. Each attraction at the park is constructed based on a *Disney* story. Because the stories are very popular with most people, we feel that the character exists in the real world when we are at *Disneyland*, and we feel that we can meet the *Disney* characters and enjoy being with them during our visit [6].

For discussing the possibility of the approach to enhance daily artifacts through transmedia storytelling, we show some existing examples, and analyze them by using the value-based analysis framework.

In this subsection, we present two case studies that use fictional stories in the real world. The first case study is a promotion for *Meiji fruit gummi candy*. We can communicate with one of the characters in the story, and the story changes according to that communication. Thus, we feel that the story is nonfictional. The case study shows a possibility to incorporate a story through social media like Facebook. The second case study is a recent trend for young people called *Seichi Junrei*. A user of a fictional story visits the place that the story is based on and expands the story by himself/herself. This ability increases his/her desire to join the story. The case study shows how a user can be involved in a story and offers some hints to enhance our current approach.

The promotion movie for *Meiji fruits gummi candy* is *Megumi and Taiyo Tweet Love Story* [25]. In the story, a heroine *Megumi* eats a grape gummi candy when she needs to think deeply. When using a fictional story, it is not easy to know how the audience feels the reality of the story through only its video movie. *Tweet Love Story* uses the social media service, *Twitter,* to make us feel the reality of the story. The audience can talk with the story's hero *Taiyo* via *Twitter. Taiyo* replies to our advices on how to get closer to *Megumi. Megumi* and *Taiyo* also talk with each other on *Twitter* so that everyone can see their conversation. The audience's advices have a strong impact on the conversation between *Megumi* and *Taiyo*; since, the story changes its ending according to our advices to *Taiyo*, which makes us feel the story nonfictional in our real world.

*Taiyo* works at a vineyard, and there are scenes showing healthy and delicious grapes. These scenes give information showing the product's excellent quality. Finally, the story uses a character designer whose characters are currently very popular in many media. Thus, the audience easily feels empathy for the characters even though the story and its characters are original.

The case study shows that the communication with virtual characters in a fictional story increases the user's belief in the reality of the story. In particular, the recent trend in social media makes it easy to realize such communication because the communication can be automatically generated by computers. For example, it is possible to realize this approach on *Facebook*. A *Facebook* page owned by a virtual character is a promising tool to allow interaction between us and the virtual character. If we become a friend with the virtual character on *Facebook,* we can communicate with it everyday, and thus feel that the communication is realistic. Therefore, we believe that the character exists in the real world.

In this case study, the most important issue is how people feel *Taiyo* and *Megumi* as people who live in the real world. The case study adopts real-time communication between *Taiyo* and *Megumi* in social media. If we feel strong empathy with *Megumi*, we also have interests in the gummi candy that *Megumi* likes. Also, the story presents that the gummi candy is healthy with the information that the grape is a healthy food as the *informative value*. The *value-based analysis framework* makes it possible to propose a proper direction to improve the story. For example, if fair trade is used to sell the product, the fact can be used to exploit the *ideological value*. Also, if eating a gummi

candy is a cheap way to maintain our health, the fact can be used to exploit the *economic value*. If the story emphasizes that eating gummi candy leads to more healthy society it can be used as the *positive value*.

The second case study, *Seichi Junrei* is a typical geek culture activity in Japan, particularly related to Japanese animation, manga (comic) and games, in which people visit famous locations from animation, manga and games. *"Seichi"* means *"Holy Land"*, *"Junrei"* means *"Pilgrimage"*. Anime fans arrive at a specific location and take pictures with the same screen/angle as it appears in the animation and upload them to their blogs. The most important aspect of *Seichi Junrei* is that something is brought from the fictional story to the real world. The fans create new stories using these pictures and the virtual characters from the fictional stories and share them within their community. This phenomenon is a very interesting example of harmonizing the real world and the fictional world. We believe that interactive pervasive games or social information services based on fictional stories are promising tools for increasing the reality of the fictional world, and the tools enhance the *Seichi Junrei* phenomena by realizing a tighter integration between the fictional and the real world. The experiences described in this paper will offer useful insights to help design tools that will realize new types of transmedia storytelling.

Recent animated movies use many scenes from the real world to increase the reality of fictional movies. A user of *Seichi Junrei* tries to find the scene that appears in the movie in the real world and takes a photo of the scene. The user enjoys finding these scenes and visiting the location of the scenes. Then, he/she takes a photo, similar to a scavenger hunt. The photos are usually uploaded to the Web, and many other people enjoy looking at the photos.

In Japan, especially, animated movies have recently been used to promote the local districts that are used in the stories. Some districts plan to attract people who like the story by offering extra original new stories to those who visit the districts. This strategy suggests that there is possibility to promote the districts with fictional stories. If real products that are famous in a district appear in the stories, then it will increase the feeling that the stories are realistic especially if the stories' audience is familiar with the products. If the stories are attractive, they will also promote the products to people who do not live in the district.

In this case study, the *positive value* and the *economic value* are the most important key factors. If the item with the strong *aesthetic* or *economic value* appearing in the fictional story becomes tangible in the real world, the reality of the fictional story is increased. The *empathetic value* is also essential for people to have strong empathy with the story. The *informative value* is also important to exploit the story in the real world. In particular, mysterious facts in the story are very effective to immerse the story in the real world. The *value-based analysis framework* makes it possible to propose some improvements on the story. If the story contains strong ideological messages as the *ideological value* and it offers the proper *positive value*, the approach offers enough power to encourage people to act in social movement.

## 7   Conclusion and Future Direction

This paper presented how fictional stories can be embedded into the real world without losing a sense of reality. We described two case studies and show that the value-based analysis framework is a good tool to assess how fictionality is incorporated in the real world without losing the reality.

In the next step, we are interested to design future services by using *virtual forms* and incorporating fictionality through the *virtual forms*. Our past experiences with persuasive ambient mirrors [11] and playful AR based training systems [24] are useful to design these new services.

## References

1. Allison, A.: Millennial Monsters: Japanese Toys and the Global Imagination. University of California Press, Berkeley (2006)
2. Bogost, I.: Persuasive Game: The Expressive Power of Video Games. MIT Press, Cambridge (2007)
3. Dena, C.: Transmedia practice: theorising the practice of expressing a fictional world across distinct media and environments. Dissertation Thesis, University Sydney (2009)
4. Desmet, P.M.A., Pohlmeyer, A.E.: Positive design: an introduction to design for subjective well-being. Int. J. Des. **7**(3), 5–19 (2013)
5. Huizinga, J.: Homo Ludens: A Study of the Play-Element in Culture. The Beacon Press, Boston (1955)
6. The Imagineers: Walt Disney Imagineering. Disney Book Group (2010)
7. Juul, J.: Half-Real: Video Games between Rea Rules ad Fictional Worlds. MIT Press, Cambridge (2005)
8. Mattila, A.S.: The role of narratives in the advertising of experiential services. J. Serv. Res. **3**(August), 35–45 (2000)
9. McGonigal, J.: Reality is Broken: Why Games Make us Better and How they Can Change the World. Penguin Press, New York (2011)
10. Mori, M.: On the uncanny valley. Energy **7**(4), 33–35 (1970). Translated by Karl F. MacDorman and Takashi Minato, Elsevier
11. Nakajima, T., Lehdonvirta, V.: Designing motivation in persuasive ambient mirrors. Pers. Ubiquit. Comput. **17**(1), 107–126 (2013)
12. Prochaska, O., Velicer, W.F.: The transtheoretical model of health behavior change. Am. J. Health Promotion **12**(1), 38–48 (1997)
13. Ruth, M., Schoormans, J.P.L., Schifferstein, H.N.J.: Product attachment: design strategies to stimulate the emotional bonding with products. In: Schifferstein, H.N.J., Hekkert, P. (eds.) Product Experience. Elsevier, Amsterdam (2007)
14. Ruppel, M.N.: Visualizing transmedia network: links, paths and peripheries. Dissertation Thesis, University of Maryland (2012)
15. Sakamoto, M., Nakajima, T., Alexandrova, T.: Enhancing values through virtuality for intelligent artifacts that influence human attitude and behavior. In: Sakamoto, M., Nakajima, T., Alexandrova, T. (eds.) Multimedia Tools Applications. Springer, New York (2014). doi: 10.1007/s11042-014-2250-5

16. Sakamoto, M., Nakajima, T.: Micro-crowdfunding: achieving a sustainable society through economic and social incentives in micro-level crowdfunding. In: Proceedings of International Conference on Mobile and Ubiquitous Multimedia (2013)
17. Sakamoto, M., Nakajima, T., Akioka, S.: Designing enhanced daily digital artifacts based on the analysis of product promotions using fictional animation stories. In: Yoshida, T., Kou, G., Skowron, A., Cao, J., Hacid, H., Zhong, N. (eds.) AMT 2013. LNCS, vol. 8210, pp. 266–277. Springer, Heidelberg (2013)
18. Sakamoto, M., Alexandrova, T., Nakajima, T.: Augmenting remote trading card play with virtual characters used in animation and game stories – towards persuasive and ambient transmedia storytelling. In: Proceedings of the Sixth International Conference on Advances in Computer-Human Interactions (2013)
19. Sakamoto, M., Nakajima, T., Akioka, S.: A methodology for Gamifying smart cities: navigating human behavior and attitude. In: Streitz, N., Markopoulos, P. (eds.) DAPI 2014. LNCS, vol. 8530, pp. 593–604. Springer, Heidelberg (2014)
20. Sakamoto, M., Nakajima, T.: The GamiMedia model: gamifying content culture. In: Rau, P. (ed.) CCD 2014. LNCS, vol. 8528, pp. 786–797. Springer, Heidelberg (2014)
21. Sakamoto, M., Alexandrova, T., Nakajima, T.: Introducing virtuality to enhance game-related physical artifacts. Int. J. Smart Home **8**(2), 137–152 (2014)
22. Sakamoto, M., Nakajima, T.: Gamifying intelligent daily environments through introducing fictionality. Int. J. Hybrid Technol. **7**(4), 259–276 (2014)
23. Szulborski, D.: This is Not a Game: A Guide to Alternate Reality Gaming. Lulu.Com, Morrisville (2005)
24. Yamabe, T., Nakaima, T.: Playful training with augmented reality games: case studies towards reality-oriented system design. Multimed. Tools Appl. **62**(1), 259–286 (2013)
25. Meiji Megumi and Taiyo. http://www.meiji.co.jp/sweets/candy_gum/fruits_gummi/part1/. Accessed 28 Sept 2012
26. NFGD: Guide Dogs Help Spread the Original Poster. http://www.nkoku.jp/pos. Accessed 12 Oct 2012
27. Perplex City. http://perplexcitywiki.com/wiki/Main_Page. Accessed 28 Sept 2012
28. Yu-Gi-Oh! Trading Card Game. http://www.yugioh-card.com/en/. Accessed 28 Sept 2012
29. Kyoto Prefecture and Ministry of Internal Affairs: National Survey Promotion Video. http://www.youtube.com/watch?v=IdAkKZKEfGU. Accessed 28 Sept 2012