

Harmonizing Virtual Forms into Traditional Artifacts to Increase Their Values

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Abstract. Computing technologies allow us to enhance our daily artifacts by adding virtual forms to the artifacts. The virtual forms present dynamically generated visual images containing information that influences a user's behavior and thinking and are usually realized by adding a display that shows visual expressions or projecting some information on the existing artifact. We have designed Augmented Trading Card Game, which adds virtual characters and special effects on the trading cards of the Nintendo DS game in order to encourage and provoke more social play of the game.

In this paper, after presenting an overview of the case study that enhances traditional artifacts with virtual forms, we present six values that play an important role in the design of the enhanced artifact.

1 Introduction

Recently, our daily digital artifacts are becoming more and more usual and widely sold commodities. For example, recently televisions developed in Japan have become cheaper and cheaper despite of their excellent product quality and functionality. Also, Android mobile phones are becoming popular recently and a wide range of models and functionalities is offered on the market. However, it is very difficult for the users to distinguish the differences in the phones and make a choice. The fact that the product quality does not become the value for many of us to buy the product shows that we need to consider another way to design daily digital artifacts. However, we found that new furniture and fashion goods attract us every year and they do not become commodities that are sold at cheaper prices with the time. The reason for this is the fact that they offer additional values to

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users. Especially, the prices for such products are kept high if the products offer the sense of rarity. Digital technologies are effective to make digital artifacts a usual commodity and as a consequence to make their prices cheaper, but these technologies are also effective to add more values to the products by customizing them for each user. The customization may offer the artifacts more attractiveness, which might lead to the increase in their prices.

Virtual forms are realized by adding displays and by projecting information on the artifacts, and can be changed dynamically according to the current surrounding situation. This approach is promising to enhance daily artifacts, and to offer more values on the artifacts. We have designed Augmented Trading Card Game (Augmented TCG), which adds virtual characters and special effects on the trading cards in the Nintendo DS game to encourage more social play of the game.

From the experiences with the design of the case study, we found six values to consider how to offer additional values in the enhanced artifacts with visual forms. The values can be used in the following steps. The first step is to identify the values in the traditional artifacts. Then, they can be used for discussing which values should be added or changed in the enhanced artifacts in order to increase their values. Finally, we consider what kinds of virtual forms can be suitable for making the artifacts richer and more enjoyable.

2 Augmented Trading Card Game

A trading card game is also commonly referred to as a collectible card game, a customizable card game, or CCG. For our purposes here, we will use trading card game (TCG) to refer to all the three varieties of games. In a nutshell, a TCG combines the collectability of trading cards with strategic game play. Typically a player purchases a starter set, containing a playable deck of cards and a manual that includes an explanation of the rules and the mechanics of the game in an introductory fashion. One of the biggest problems faced by any new TCG player is the need for an opponent to truly engage in the game play, as it is extremely unusual for any TCG to feature a solitaire mode. Players usually begin playing with a friend, at a particular location such as a hobby game store that offers organized gaming opportunities and includes a tutorial component, or via an online portal.

Computer-based TCG is also becoming popular, and in our project we make a comparison between the real TCG, and its virtual one running on Nintendo DS. An important conclusion resulting from that comparison is that the computer-based TCG loses a lot of realities offered by the real TCG. For example, the sense of real cards is essential for many TCG players since making and completing collections of cards is a significant fount of pleasure for them. The computer-based TCG also implies some communication limitations, because it allows a player neither to have an eye-to-eye contact, nor to look at or chat with the opponent player.

As described above, although most of the current computer-based TCGs lose the realities of the real TCG, we claim that ubiquitous computing technologies may help to recover these lost realities and encourage and attract players to enjoy the computer-based TCG in a very similar way to the real TCG. Moreover, adding

special effects and virtual forms to the computer-based game might increase the excitement of the game even more than the real one.

Figure 1 shows Augmented Trading Card Game that is currently developed in our project. The system extends the trading card game running on Nintendo DS, where two players are usually located in different places while playing the game. In Augmented TCG, the opponent player is represented as a virtual character that is visualized using a tool called MikuMikuDance. The movement of the character is synchronized with the movement of the real opponent player by using MS Kinect, and the behavior of the character is determined by the information retrieved from a biosensor attached to the opponent player, i.e. the virtual character’s behavior and emotions reflect the real player’s behavior to some extent. In Augmented TCG, two virtual forms are used. The first form is superimposed onto the playing table to show the virtual trading cards and some special effects during the play. The second virtual form is installed on the wall to show a virtual character.

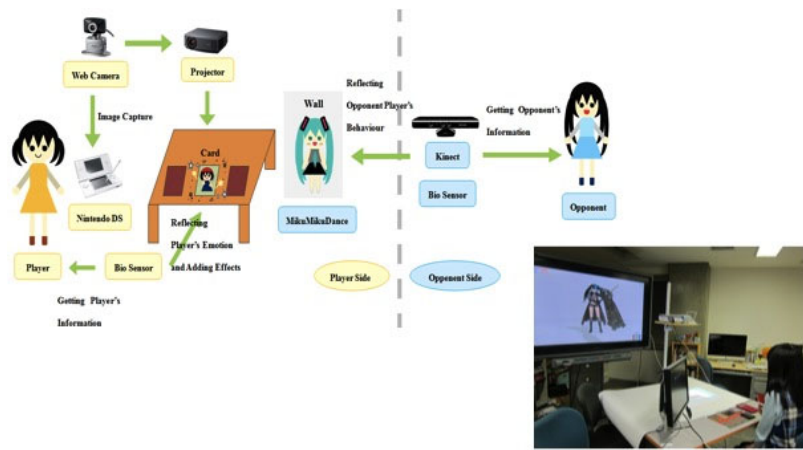


Fig. 1 Augmented Trading Card Game

The trading card itself is also enhanced in the system. Cards presented on the display of the Nintendo DS are retrieved by Web cameras and projected on a real table. The projected cards can be enhanced by adding special battle effects or empathetic effects to the characters shown on the cards.

In the original computer-based game, a player usually cannot see the opponent player. The proposed Augmented TCG enables us to recover this lost reality by adding a virtual character whose movement and behavior are synchronized with the movement and behavior of the real opponent. In addition, the virtual trading cards carry some special effects that increase the sense and the excitement of the battle. Similarly, if the character drawn on a trading card shows some empathic expressions, a player feels empathy with the character on the card, and feels more enthusiastic and committed to the game. These special effects compensate the

lost realities of the real trading cards. Also, virtually attached rarity to the virtual trading cards brings a feeling of reality and encourages a strong will to collect virtual trading cards.

3 Design Implications

Baudrillard proposed that the consumption becomes more symbolized and additional values become more important than the products as materials [1]. For example, a brand offers significant additional values to fashion items, and consumers feel the value on their virtual properties. On the other hand, adding values to virtual items makes a user feel the items materialized. This means that real products are becoming more virtual, and virtual products are becoming more real.

From the experiences with Augmented TCG, we extract six values to be used in the design of virtual forms that augment traditional artifacts. The first value is the physical value that offers the tangibility to the artifacts. During the design of Augmented TCG we have found that many players prefer the feeling of the tangibility of the real trading cards while playing a game. We believe that this value increases the reality when some artifacts exist in the virtual world. The second value is the empathetic value. In Augmented TCG, the usage of this value in the virtual character increases the friendship with the opponent character when the player likes the character. The third value is the persuasive value that offers extrinsic motivation to a user. In the case study, a virtual character drawn on a player's card appears on the battle field. The character shows strong will to win the game, and encourages the player not to lose his/her bravery. The fourth value is the informative value. The value is effective to make a better decision. In Augmented TCG, some detailed information about the card used by the opponent player is projected on the battlefield to provoke a better decision and strategy play in the game. The next value is the economic value. The value is not directly used in the case studies, but we discuss the importance of the value when designing the case studies. For example, a player might like to buy special effects in Augmented TCG in order to improve the play or increase the excitement of the game. Finally, the last value is the ideological value. The value represents the metaphor that shows the dream or the expectation of a user. In the case study, a virtual character, who is a famous and strong trading card game's hero in an animation story, appears during the game. This encourages the player to imitate the hero and thus become a strong and noble player like him.

The described values are useful to identify what the main values of the traditional artifacts are and how to add additional values to the artifacts for making them richer and more enjoyable. For example, in Augmented TCG, we found that the original game running on Nintendo DS has some problems. For example, since the player does not see the opponent player, he/she tends to easily cheat in the game. We believe that using the empathetic value to the virtual character of the opponent player will prevent from cheating in the game. Moreover, adding special effects to the trading cards are useful to motivate the players to win the game fairly.

During the discussion of the case studies' development, we consider the importance of the economic value. We consider that incorporating virtual items to be exchanged among users is a promising way to motivate users to use the enhanced artifact [2]. For example, if a user develops a new way of customization of an artifact, the other users might be interested to use the customization even if they need to pay some money for it. We believe that this kind of customization may offer an attractive business model to artifacts.

Our approach to add virtual forms to existing artifacts makes it possible to gamify the use of the artifacts and make it more enjoyable. Gamification [3] recently becomes a popular way to make daily and business activities more enjoyable. We hope that the proposed values are also useful to gamify these human activities.

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