Hybrid Service Integration Engineering: Implications from a Game-Story-Combined Mobile Social Game

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Abstract. The content business has witnessed a turning point toward service engineering. Information was a precious resource in the past, however, that is not so true anymore. Content providers need to address the issue of how they position themselves in terms of their standpoint on servicization. Mobile social games are increasingly attracting attention from the viewpoint of revenue-generating engines. The massive revenue-generating capability of mobile social games has accelerated the advances in service engineering. The author focuses on a mobile social game called "Peony Garden" and discusses the implications of servicization in the mobile content.

1 Introduction

The era of Information has changed the meaning of information in the content business. When information was a scarce resource, providing information was the mainstream of the content business. The mass media born in the 20th century has inherited this DNA from its glorious success for decades.

The content landscape has drastically changed by advances in the information and communication technologies. Information is not a scarce resource anymore. The massive quantity of information stored on the Internet has drastically decreased the value of information.

At the same time, the value of services has increased. As long as the end users appreciate the value of services, there will be an increasing opportunity to generate revenue. One example is the mobile social game market in Japan. The major SNS providers started providing open platforms in late 2009. Within one and a half years, it has created a 100 billion yen market.

The author focuses on a game called "Peony Garden" and discusses the meaning of service engineering in this era of abundant high-speed information and communication technologies.

The author examines the extension of Gamenics theory to general service engineering from the implications of the analysis.

2   Purpose and Related Works

2.1   Purpose of Research

The aim of this paper is to identify the factors that drive the success of mobile social games.

2.2   Related Works

Mobile social games have some unique factors like ubiquity and high community-oriented-ness.

Ubiquity helps to maintain motivation. Ahtinen discussed the possibilities of mobile wellness applications in reference to their ubiquity and technological capabilities [1].

High community-oriented-ness provides the suitability of game-based learning of social norms. Early focus on multi-player games on mobile handsets was discussed by Paul [6]. Hildmann discussed game-based learning of social norms [3].

Various approaches have been taken in the mobile social games in order to cope with capability constraints. Ivanov discussed a summarization technique for mobile social album sharing [5].

Gamenics is a massive body of know-how related to the user interfaces that were first created by Nintendo for the Japanese videogames market. Isbister summarized Gamenics theory in an interview with Professor Saito, the inventor of Gamenics theory [4] (Chapter 23.1).

Febretti discussed the difference between usability and playability with regard to long-term engagement [2].

Yamakami presented a community-based stage model in order to explain the evolution of the mobile content business in Japan [7].

Past literature did not capture the service engineering aspects of mobile social games with a departure from legacy categories.

The originality of this paper lies in its identification of a new concept of "hybrid service engineering," in the context of mobile social service engineering with an extension to Gamenics theory.

3   Industrial Landscape

3.1   Stage Model of Mobile Business

In the last century, many content providers depended upon their competence in dealing with the scarcity of information resources. It was time-consuming to refine the quality of information,

This preciousness of information has been lost gradually through the rapid advances in information and communication technologies. The costs for storing and copying digital information have drastically dropped during the past decades. This leverages the need to convert information delivery services into user-experience-oriented services.

The transitions in the evolution of business models are depicted in Fig. 1. The original paradigm of the Internet was just a replacement of information transfer using a digital method. At the early stage, the Internet was just a pile of unstructured information.
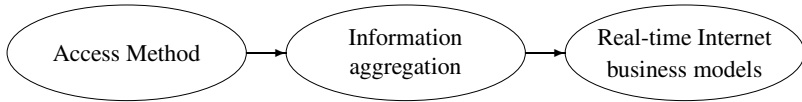
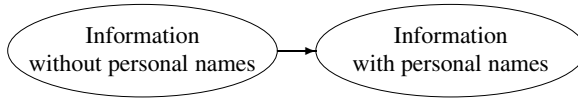**Fig. 1.** Transition of Business Model towards Real-time Internet

Fig. 2. Trend of Information with Personal Names

The emergence of the ubiquitous high-speed Internet and inclusion of social networks have leveraged the real-time Internet business models that include a wide rande of social factors.

These are driven by the trend depicted in Fig. 2. In 1990's, almost no one in the Internet cared who wrote the web pages, because information was uploaded by the persons who were not the original authors in many cases. The emergence of real-time human networks has driven the emergence of information with personal names, which has impacts on business model engineering.

In the past, information had no links to personal names. People did not care who wrote the pages of Yahoo!, Wiki pages, and so on. Information is something can be copied by anyone, so its sources were of no concern. For the most part in the early days, the person who uploaded a piece of information was a good-will engineer without a name, and not the original author.

Quantity changes the quality. The bandwidth used for Internet traffic has grown at a blistering pace.

The human network of information, with Twitter, and Facebook, and so on, has grown and outnumbers other traffic like Google now.

The real-time Internet was imagined to be something like video Internet, broadcast Internet in the early days. Also, after the emergence of ubiquitous computing, it was imagined to be something like the Internet of things, with millions of interconnected sensor devices.

At this point, we have to agree that the current state of art of the Internet has brought with it a new definition of the real-time Internet, which is an Internet with billions of people interacting in a real-time manner with twitterers and communicating via SNS services.

This new real-time Internet had brought a massive impact on Internet business model engineering. Social services like Twitter and Facebook still have some way to explore their revenue-generating engines. They should be free services because no one will invite others to join paid services. This is a weak point of the business models of social services. However, in areas adjacent to these social services, a new trend of revenue-generating engines has emerged. One example is a social game vendor, such as Zynga,

which leverages the power of social networks for their revenue-generating engines. Another example is a social commerce service, such as Groupon, which leverages the power of social networks for its coupon commerce.

Information is heavily laden with personal names, with human contexts and human emotions.

3.2 Example of Peony Garden

"Peony Garden" is a popular social game in Japan. It is a multiple ending story where the story is influenced by a sequence of choices that the reader makes as the story develops. One of the characteristics of this game is that a mini-game is associated with it to earn the points required to read more of the story. The story is split into pieces, and some game points earned in mini-games are required to read each piece. Therefore, it is a *game-story-combined* mobile social game.

This game is free, however, some of the option items can also be purchased. If a user would like to read the next piece of story beyond the number of game points earned, the user can purchase a ticket to read it.

Interestingly, although, it is that it is highly possible that no one would pay for the story or a mini-game, the combination of story, mini-games and social aspect makes the revenue-generation possible.

The design of this game is depicted in Fig. 3. This is interesting because it artificially inserts the time-consuming prefix games before the main content. It makes the consuming process of content more complicated with insertion of gaming experience. The game itself is not essential, however, the combination makes the new value for its content.

3.3 Gamenics Theory

Games can provide some clues for these new challenges to revenue-generation. Gamenics is one of these clues. The theory demonstrates that we need to explore the time-dimensional control in games in order to cultivate an increased mind-share in end users.
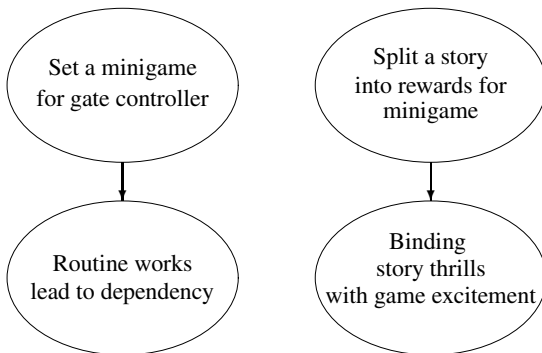

Fig. 3. The game design of Peony Garden

Gamenics is the massive body of know-how related to the user interfaces that were first created by Nintendo for the Japanese videogames market. Professor Akihiro Saito coined this word "gamenics", which is a portmanteau combining the word "game" with the "nics" of "electronics" and "mechanics." Gamenics is different from game design. Game design makes a game interesting, and gamenics is what communicate this to the player. Professor Saito argued that any complicated system can be operated, even by children, with the help of Gamenics. Gamenics is the method of teaching users how to play. The uniqueness of Gamenics theory is that it focuses on the dimension of time. Gamenics suggests that increased complexity should be provided together with the joy of mastering new operations or know-how as the user increases the understanding of the game, Incremental achievements strengthen the learning, therefore, kids can master a very complicated operation over a span of time. For this, There is much know-how regarding how successive frustration-achievement cycles should be presented to a user in order to achieve this learning process.

This massive know-how was derived through decades of struggling over how to facilitate user learning with very limited hardware capabilities, using detailed tuning of software. This is understandable considering the decades of evolutionary history of game consoles. Game consoles were invented in the U.S, however, after game consoles were equipped with software tuning, the main battlefield was shifted from the U.S. to Japan.

In other words, Gamenics theory is the know-how of software-tuned learning systems. It consists of structured decision branches with four rules:

- Intuitive user interface
- Understanding operations without a manual
- Game direction toward being addicted to and the effect of incremental learning
- Externalization of the game

It is a collection of know-how about how game design leads users to get into a game. Gamenics is unique in its handling of the time dimension in the user interface, much different from universal design theory or affordance theory.

Saito described how ordinary children all over the world can play a Nintendo game without reading the Japanese manuals The game, Dragon Quest, contains 1500 different pieces of information, including locations, monsters, items and tactics. However, children of the age 10 easily absorb and manage all of these pieces of information. It is said that the typical English speech of a President of the United States is composed from a 500-word English vocabulary. When the appropriate methodology is undertaken, any child can say a President's speech without difficulty.

There are several basic rules behind Gamenics theory. A "game" is fundamentally a process that creates a virtual stress and an opportunity to remove this stress. During the removal of a stress, people experience a happy feeling. This is the driving force for a game.

The position of Gamenics theory within the scope of game design is illustrated in Fig. 4.

Gamenics theory places an emphasis on time-dimensional control in the learning process. It assumes user evolution over a span of time to add complexity and to stimulate the joy of learning and achievement. These time-dimensional and learning-centric methods are key to Gamenics theory.
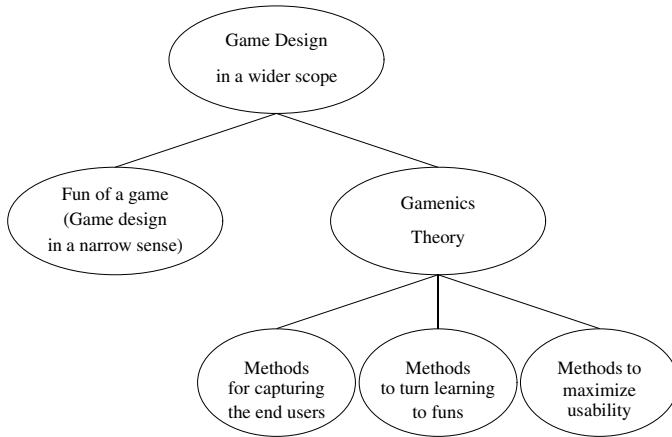
Fig. 4. Overview of game design including Gamenics theory

Saito claims that the unique feature of the Gamenics theory is its time-dimensional considerations which make it unique compared to Affordance theory and Universal design theory.

3.4   Why We Have to Extend Gamenics to Hybrid Service Engineering

Gamenics is a step forward in controlling the time-dimensional management in game design. The social dimension is captured in the 4th rule of Gamenics, however, it must be further enhanced in view of the emergence of massive social games. The social dimension is becoming an increasingly important aspect of game design in the era of real-time Internet.

And, Gamenics is not clear in two aspects: (a) dependency management, and (b) expectation management. Both factors are crucial to game design. In order to highlight the service engineering aspect of Gamenics theory, it is important to focus these two aspects when implementing of four rules of Gamenics theory.

The most important reason to extend Gamenics theory is that we need a broader sense of service engineering even when utilizing game design. Information and other content including games are parts of service engineering. Standalone categories do not make sense when the service providers focus on what a service is.

Hybrid service engineering is a framework whereby multiple pieces of content are reconstructed to create a service utilizing enhanced Gamenics theory with a focus on dependency management and expectation management.
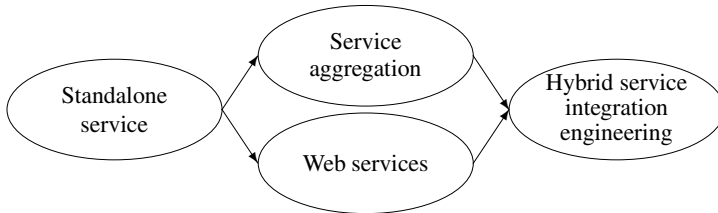
3.5   Hybrid Service Engineering

Mobile social game design consists of five different factors:

The media business has been in trouble since the emergence of the Internet. Most of the mass media business such as TV, radio, magazines and newspapers witnessed their glory days from the early to the middle of the 20th century. During those success

Table 1. Five factors of mobile social game design

Item	Description
Routine work	Monotonous routine work that facilitates regular gaming from addiction
Skills	Minor skills to achieve small goals, e.g. finger actions
Chances	Dependency on luck
Tactics	Mid-term and long-term strategies
Social relationship	Greeting exchange, support, trust, social rewards, social recognition, . . .

Fig. 5. Transitions of service engineering

days, information was a rare resource. When information was scarce, providing the information itself was an important service.

Radical advances in information and communication technologies brought with them the new paradigm of services. When there is ambient information that cannot be processed by end users, simply providing information does not make a useful service anymore. Therefore, we have to develop a new methodology to explore servicization in an era of ambient information.

Servicization is an industrial shift from product manufacturing to service development. As the user satisfaction shifts from ownership of a product to use experience of a service, servicization has come to a main focus of many industrial sections. The author coined the new concept "Hybrid Service Engineering" in order to extend Gamenics to the broader sense of servicization.

Hybrid service engineering is a concept that explores the time-dimensional management of user mind-share using social and time dimensional extension of Gamenics.

The transitions in the evolution of service engineering are depicted in Fig. 5. The user satisfaction depends on how content are presented not just as information but as services. One of the techniques to enable this is time-dimensional control, as presented in the game "peony garden".

4   Discussion

4.1   Advantages of the Proposed Approach

Service science was a term introduced by IBM to describe the study, design, and implementation of services systems. It was initiated in IBM laboratories in 1993, and widely known around 2004 with the margining industrial and academic attention to management of services. Service science provides people in the service industries with the

quantitative skills necessary to model key decisions and performance metrics associated with services. Service science in the past did not focus on the time-dimensional management, dependency management and expectation management well.

Hybrid service engineering focuses the service engineering utilizing extended Gamenics theory to reflect the lessons learned from the mobile social games. It deals with the time dimensional management of a combination of multiple services and content that creates new values for users.

Hybrid service engineering is a framework in which holistic service engineering is performed with a departure from the legacy content categories. Simply providing information or providing games is not sufficient to build a service anymore. Given the ambient information and content available on the Internet, service engineering needs to focus how each item of content can be integrated into a service while managing dependencies and expectations. These factors are critical in mobile services because mobile users are easy-come and easy-go.

4.2   Limitations

This research is a qualitative study. Quantitative measures for verifying multiple aspects in the hybrid service engineering discussed in this paper remain for further study.

Acceptance of mobile social games is an ongoing transitive prolegomenon that requires further observation with regard to game design and playability.

Detailed research models of mobile social games and their verification are beyond the scope of this paper.

Different games have different target users. This paper does not address the diversity of mobile social games.

Japanese mobile social games are different from Facebook games in terms of the identity and trust structure. Detailed study of Japanese-specific regional factors is beyond the scope of this paper.

5   Conclusion

Ambient information on the Internet has impacted the content industry by eliminating the scarcity of information resources upon which many content providers based their core competence, and diminishing that source of revenue. The content industry needs to address this issue and explore new revenue-generating opportunities.

At the same time, the Internet itself has witnessed a turning point from the massive collection of past information to the massive collection of current ongoing personal information.

This has brought about new business opportunities such as Zynga and Groupon.

The mobile social game market in Japan has been growing rapidly, reaching more than one billion US dollars in the one and a half years since OpenSocial acceptance in late 2009. That rapid growth has brought a wide range of trials with new mobile content as games.

The author discussed the implications of "Peony Garden" a popular mobile social game in Japan. This game represents a new paradigm of service engineering that does not depend on the legacy concepts of games and e-books.

With the examination of the game design principles of this game, the author proposes a new framework of "Hybrid service engineering," in order to extend Gamenics theory to service integration in the context of mobile social games.

Hybrid service engineering is a paradigm for service engineering in the current context of ambient information and highly-interactive services.

Hybrid service engineering extends Gamenics theory with dependency management and expectation management. The author believes that this conceptual framework scan serve as a vehicle of new media services that are a departure from the fixed legacy content categories of the past.

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