How to enhance Competitive Advantage of Digital Content Industries? - A case study of Taiwan

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ABSTRACT: On account for the rising of XDSL construction in Taiwan recent years, hundred of thousands people have become interested in digital content. Digital content is a creative industry, accompanied with emergence of rapid changed technologies and innovative business models, the government all over the world would be devoted to promoting the competitive advantage in digital content industries. From perspective of "digital independence", online game is regarded as the most cultural and innovative among them. While designing the online games architecture researchers provide due importance to technology. However, the present paper place emphasis on human element in architecture related to online games. The Taiwan experience is used to construct the online game architecture.

Categories and Subject Descriptors
K.8 [Personal Computing]: Games; H.3.5 [Online Information Services]; Web based services

General Terms
Online games, Architecture, Man power element

Keywords: Digital content, Taiwan digital industry, Online games

Introduction
With rapid transition of technologies in recent years, IT not only has dramatically fostered innovations in goods and services, but has changed the way many businesses operate as well. Besides, under the trend of globalization and free market, how a country could face the global competition, stimulate the domestic economy, and improve the global competitiveness has become an urgent issue. Technology and economy are significant sources of the national competitiveness. The economic development relies on the upgrade of industry, and the driving force for industry upgrading depends on technology innovation. Besides, a lot of industries in Taiwan have to against the economical changes and challenges. However, in knowledge economy, the applications of knowledge sources will be against the economical changes and challenges. However, in knowledge economy, the applications of knowledge sources will be stressed on the future in addition to the specialized and entrepreneurial management. Digital Content Industries characterized as "economy" and "knowledge" are considered to be the most potential and competitive industries in Taiwan.

Recently, because of the advent of broadband network era and the progress of infrastructure in IT, Digital content with voice, image, animation, games attract hundred of thousands people to get along with, so that digital content industries make extreme progress and profits in recent years. Especially, online games industries have convergence on technology, culture, marketing, capital and so on, producing amount of innovation and profits and attracting hundred of thousands people to play. They are not only regarded as one of most knowledge-based but also the most competitive one in digital content industries.

Significance of Online games
The critical aspect of online games is that many people can play them through the online network provided by PC communication services. The predecessors of online games were video games, PC games, and arcade games. Online games were initially created in the USA in 1969 and became popular in universities in the 1980's with the emergence of the TCP/IP network communication agreement at that time. The enhancement of computer multimedia functions and the emergence of the World-Wide-Web (WWW) brought online games a newborn stage in the early 1990's. Several years later, in the late 1990's, online games entered a new era, a growth stage, with the number of players swelling sharply. In 2004, worldwide sales are estimated to reach about US$ 4,500 million, with an average growth rate of 37.6% for each of the last 5 years. Overall sales have helped online games to reach second place in the electronic game market, while South Korea and Taiwan are the two largest markets, with their market size ranking in that order. Current online games can be categorized into simulation games, role playing games, and shooting games. (fig.1) [1].

Online games are the future of the interactive entertainment industry. The idea of integrating business services into online games holds a number of exciting possibilities for new business models, new markets, and new growth. [2]. Besides, computer based and, more recently, online games have become a universal feature of popular culture. The drive for realism and dramatic fantasy demands some of the most sophisticated software, hardware, animation and graphic design performance standards in the information and communication technology domain. The associated skills endow companies and localities with significant competitive advantage [3].

Core competitiveness among online game
Taiwan and Digital Content
Realising the importance of digital content asset, the government in Taiwan has included digital content industries among the priorities of development program for "challenge 2008—national development plan" and "Two Trillions Double Stars Industries Development Plan", hoping to construct the most competitive and internationalized industries for next economic miracle in Taiwan, as it shows on Figure 2.

<table>
<thead>
<tr>
<th>Types</th>
<th>Characteristics</th>
<th>Games</th>
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<tbody>
<tr>
<td>Role playing games</td>
<td>Playing the role in a given environment</td>
<td>Ultima Online Wizard Series</td>
</tr>
<tr>
<td>Simulation games</td>
<td>Simulation of experience</td>
<td>Starcraft, Three Nations Series, Tiberian Sun</td>
</tr>
<tr>
<td>MUD games</td>
<td>Tex-oriented role playing game</td>
<td>Avaron, DOOM, Nation of Wind</td>
</tr>
<tr>
<td>Shooting games</td>
<td>Shooting and hitting the target</td>
<td>Gallerg, Fortress 2</td>
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Figure 1. Types of Online Games
In the past 50 years, development of Taiwan’s industry has evolved from the process of imports to exports to expanded requirements for infrastructure to value-added manufacturing to hi-tech industry. It is the story of from rags to riches, from the bottom to the top that had drawn admiration of the world. It is also like the roaring waves in the dark ditch driven by the sky-rocking and earth-shaking ocean. The uninterrupted momentum has been catalyzing Taiwan’s industry from manufacturing to service, from hardware to software, from tangible to intangible, from local to global, from creation to innovation, from production value to value-addition, making the transformation a comprehensive experience that ranges from small scale to giant scale in depth. The vision of the policy is as follows [4].

- To make Taiwan the hub for development, design and manufacture of digital content in Asia-Pacific region.
- To elevate Taiwan’s overall industrial competitiveness through employment of digital high technology.
- To bring about development of related manufacturing industry and periphery derivative knowledge service industry.
- To build up a culture-rich industrial structure with innovative connotation, to successfully materialize transference of industrial paradigm in Taiwan.

Consequently, it is significant to eliminate the negative effect to maintain the industrial development in a perfect timing during planning of the industrial policy. In the meantime, the resources must be integrated according to the gradual demands, the coordination of the economic environment in domestic and foreign, and the development direction to adjust market mechanism by taking the free competition mechanism as the primary and counseling the industrial development as the auxiliary.

### Core Competitiveness in Online Games

Innovation is the term used to describe how organizations create value by developing new knowledge or by using existing knowledge in new ways. Many of today’s businesses face a conundrum: They are acutely aware that innovation is a growing imperative but see themselves as only moderately successful innovators. [5]. Namely, the core value of online games industries are considered to be “consistent innovative abilities to create knowledge based by means of products”, for popular, cultural entertainment needs. Furthermore, the resources of its innovation are deeply originated from plenty of professional manpower requirement among digital content industries.

### Human element in Online Games

In developed economies, information and knowledge are seen as the principal drivers of value-creation. In recent years, significant effort has been devoted to understanding and emphasizing the role of knowledge in conferring competitive advantage. Central to this is the notion of “a fundamental shift in the corporate value system, away from physical and financial assets (now commoditized) towards the creative exploitation of a nexus of intangible assets, quasi-assets and competences - mainly in the form of distinctive capabilities deriving from knowledge intangible. Within strategic management, for instance, the focus has recently been on the comprehension of “what” an organization currently knows, “what” it needs to know in order to be competitive and “how” it should align its capabilities to those ones required. [6] For online game industries, competitive advantage originates from consistent investment in human capital. Enterprises have recognized that it is not just financial and technological capital that provide companies with the competitive edge, but people, or human capital. Also, the development of human resources is of vital importance for all enterprises. In today’s fast-paced business environment, innovation is a prerequisite for success—perhaps even for survival.

### A Competitive Framework of Manpower Structure

The organization of R&D activities has a large impact on a company’s ability to execute its business and technology strategy. Thus, technologists face the challenging question, “What’s the best structure for my industry?” Recent studies have shown that R&D structures reflect companies’ strategies for using technology to

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Figure 2 Organization of Executive Yuan (MOEA, 2006)

Figure 3. Ontology required for Manpower architecture for online games
create value, but alignment with strategy is not enough to design a good R&D structure. There is also the need to evolve structures and orchestrate transitions that address the dynamics of a company's internal and external environments. A mismatched structure can defeat attempts to implement a good strategy.[7]

The architectures in so far developed have addressed the technical components in detail with less emphasis on human element. Through this paper we stress that manpower element is significant in framing the architecture for online games and show an explicit architecture where man power is given due emphasis.

Online systems have been designed, developed and implemented for the purpose of supporting specific business objectives and goals. Hence, the components of a system have to be defined abstrusely so that the implementation proceeds in a required platform. To compare the architectural, functional, methodological and technological framework of online games with emphasis on human element, a standard reference model can be used. This reference model defines possible views on systems such as Memory structure, Perception, Environmental components and action. The figure 3 represents the ontology required for Manpower architecture for online games.

Below, we present the components required for building the human element based architecture. These components need to co-exist in a same environment.

Memory Structure
The significance of memory structure for online games is visualized in Ji et al. [8]. The strength of an ideal architecture for online games depends on the ontology that build the memory aspect in games. The structure depends on the execution process where the actions are stored in memories, updated and personalised actions enable to transform the actions into memory where best actions procedures can be represented using virtual ontologies. Ontology enables to transform the actions into memory where best actions become the meta data for future standardization activities. The structure depends on the execution process where the actions are stored in memories, updated and personalised actions enable to build the module. A virtual inhabitant can have his unique memory structure (especially in the Ontology), action selection module, perception and action module. [10] The activities in a learning module calculate the logical changes about the virtual environment and the virtual inhabitant’s state. [11].

Perception
Perception of the people during online games enable to understand the environment and transfer the data obtained to the memory units. Perception is significant as it records the successful deployment of actions and understanding of the users. Once the data is recorded it may lead to reject the difficulties and ease the success operations. The perception module and actuator is designed to reflect the fatigue mechanism, where the efficiency of the percept and actuators are gradually decreased with respect to the stress. This has been proved in [12] while the virtual inhabitants are studied.

Environment
Much online game architecture ignores the environmental impact while designing. The impact of environment at instances helps to realize the de facto condition and lead to draw a perfect design. In virtual life, manpower planning depends on environment and hence the present ontology module employs the environmental factor as a crucial element. In this phase of modelling, the platform independent specification of the components’ properties is performed describing the business, the information and the computational viewpoint of every component needed in online games. Once the models are built with incorporating environment they can be portable to any condition with specific database models, operating systems' requirements, etc.

Actuation
As a clear departure from the elegant model of Ji et al, we have segregated the actuation and perception into two different components as actuation in our model mainly speaks of the users initiation. In other way we can stress that the actuation implies the mechanisms adapted by the users in all forms and means which denote the execution. Recording of mechanisms would enhance the operations of gaming in the online environment.

Game transformation
The user effort is a set of conditions (weight, attribute, predicate, value), where the attributes belong to a standard schema that give rise to scores. A schema is a set of named and typed attributes. The data type of an attribute defines the media type, the domain and the (vague) predicates. As the proposed architecture considers varied games with different schemas, one major task is to transform the user effort into its action-specific one or the proprietary action.

Conclusion
To sum up, Digital content is a creative industry, accompanied with emergence of rapid changed technologies and innovative business models, especially online game industries. Under the trend of globalization, free market and rapid transition of technologies, how do the online game industries enhance and improve their competitive advantage? By means of analyses above, there have to be some ways to be done among enterprises as follows:

Innovation is the resource of profits and success in digital content industries, which not only symbolizes the value chain of their business model, but also is the key point of growth strategy and planning in the future.

- Consistent investment in human capital, such as education, promotion and so forth, is merely the core value of its competitive advantage, but is the Sustainable Development among online game industries as well.
- The necessities and importance of reconstruction of manpower have to undertake right away, all of which are mainly inclusive of manager group, producer group, sales & publicity group and Intellectual Property protection group.
- Architectural designs can proceed by incorporating human element.

Currently, end-users have varied options relating to the access and use of a large number of distributed online games. To satisfy the end-users, relevant online games have to be selected and made accessible to them. Whenever necessary the online games have to be reformulated and reconstructed and re-hosted for every type of users w. r. t. its schema and features, and the results have to be fused. We initiate further research in the architectural designs for online games so that a fused architecture can address the underlying challenges.

References


