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# Developing A Digital Contents Valuing Model: How Users Appreciate Their Values

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## ABSTRACT

*The principal objective of this paper was to propose and verify a digital content valuing model, which is expected to perform a significant role in future research, and provide novel and practical implications. For the efficacy of a model for the evaluation of digital content value, this study reviewed digital content value and categorized it into intrinsic, interaction, and business value. Based on the research model, we attempted to identify and assess the effects of intrinsic digital content value on digital content interaction value, and to characterize the relationship between digital content interaction value and digital content business value. Consequently, this study finds strong interrelations among different types of values and these interactions lead a value addition to digital content usage. We hope that the proposed valuing model of digital contents will prove useful and provide further research insights, and will also increase our understanding of digital content valuing process.*

**KEYWORDS:** digital content, value evaluation, intrinsic value, interaction value, business value

## INTRODUCTION

With the exponential growth of digital content businesses in recent years, the digital content industry is being increasingly recognized as a core industry for knowledge-based societies, and is receiving a great deal of attention as a new information technology-based industry that may ultimately supplant the old industry (Meisel, 2008; Smith & Telang, 2009; Tsai, Lee, & Yu, 2008). The digital content industry is a significant business sector, which includes all business fields

associated with information and culture (Feijoo, Maghiros, Abadie, & Gomez-Barroso, 2009; Hargittai & Walejko, 2008; Oestreicher-Singer & Zalmanson, 2013). The term "digital content" is a combination of the concepts "digital" and "content", and thus the term originally encompassed text, voice, music, video, movies, etc. (Bradley, Kim, Kim, & Lee, 2012; Lang, Shang, & Vragov, 2009). Information and creative works that existed previously in analog form in the marketplace are currently appearing simultaneously in both analog and digital formats (Hargittai & Walejko, 2008; Traw, 2003). For example, books circulated in analog form previously are now emerging in digitized form, as e-books (Lang et al., 2009; Rowley, 2008). It has recently become clear that the wire- and wireless Internet has become a channel for the distribution of digital content products, and thus the number of digital content products accessible on the Internet is increasing constantly, particularly as compared to the content currently being released in analog form (Rowley, 2008; Tsai et al., 2008; Williams, Chatterjee, & Rossi, 2008). Growing evidence of this trend can be seen in digital content businesses such as digital animation, digital music, digital movies, etc. (Hargittai & Walejko, 2008; Lang et al., 2009; Meisel, 2008; Smith & Telang, 2009; Stini, Mauve, Heine, & Fitzek, 2006; Traw, 2003).

As a result of advances in platform and distributed channels, digital contents (hereinafter referred to as "DC") can currently be enjoyed using a variety of media, which has ultimately resulted in a diminution of users' loyalties to specific channels (Shi, Rui, & Whinston, 2014; Smith & Telang, 2009; Stini et al., 2006). Moreover, the characteristics of traditional media users and Web 2.0 users differ substantially (Hargittai & Walejko, 2008). For example, one of the most significant features in this regard is that the passivity of the traditional user is changing to a more active participation paradigm in the Web 2.0 era. This type of participation, coupled with the digital content environment, emphasizes the manner in which users evaluate the value of DC and the interactions between the user and the content (Feijoo et al., 2009; Hargittai & Walejko, 2008; Lai & Turban, 2008; Oestreicher-Singer & Zalmanson, 2013). For instance, creativity and rich content are crucial elements of digital content values in the DC industry (Lai & Turban, 2008; Parameswaran, Stallaert, & Whinston, 2008). On the other hand, Web 2.0 users tend to emphasize the importance of superior interaction when evaluating the value of DC (Feijoo et al., 2009; Hargittai & Walejko, 2008). Moreover, digital content interactions are expected to exert a growing effect on product, user, and process values (Feijoo et al., 2009).

Therefore, researchers are becoming increasingly interested in research designed to evaluate the value of digital content, specifically in terms of the proper methods for enhancing and increasing DC value (Parameswaran et al., 2008; Rowley,

2008; Williams et al., 2008). To better understand on the progression of digital contents, this research attempts to open new horizons for the evaluation of digital content value. In an effort to evaluate the value associated with DC, the following section addresses the theoretical background underlying the value of DC in terms of intrinsic value, interaction value, and business value. The section three addresses the research model and hypotheses, and then the fourth section follows with empirical analysis of this proposed model. In the last section, our conclusions are presented, along with a discussion of the implications of this study.

## THEORETICAL BACKGROUND

In general, the concept of value is defined in terms of value, price, and utility. According to a philosophical perspective of valuation, Zeithaml (1988) has defined value as an "interactive preference experience". That is, value can be generally conceptualized as the interaction occurring between the user and a physical or psychological item. It can also be defined in relation to the environment and the prevailing circumstances. These definitions tend to be consistent with the characteristics of the DC value, such that researchers in the DC field should seriously consider the concept of value in order to adequately evaluate digital content value (Feijoo et al., 2009; Hargittai & Walejko, 2008; Rowley, 2008; Stini et al., 2006). Because the value of DC may be composed of intrinsic value, interaction value, and business value (Hui & Chau, 2002; Parameswaran et al., 2008; Rowley, 2008; Williams et al., 2008), we attempt in this section to elucidate the theoretical background of the DC value, as follows.

### Intrinsic Value of Digital Content

Sheth, Newmann, and Gross (1991) evaluated the values that affect consumer choice, and subdivided them into five values: functional value, social value, emotional value, conditional value, and epistemic value. Additionally, Sweeney and Soutar (2001) conducted empirical research into the user values previously described by Sheth et al. (1991), ultimately dividing them into the concepts of emotional value, social value, functional value, and price value. Table 1 arranges the elements nominated in common among the variables relevant to value as presented by Sheth et al. (1991), and Sweeney and Soutar (2001), regarding them as the compositional elements of the intrinsic value of DC. They are defined as intrinsic values because appreciation of their values does not involve direct interaction among users and/or contents of the same DC. Functional, emotional, and social value were commonly cited by both researchers. However, the "price

value" as presented by Sweeney and Soutar (2001) and the "conditional value" presented by Sheth et al. (1991) are referred to herein as the "economic value".

**Table 1. Intrinsic value of DC**

| Element | Definition | References |
|---|---|---|
| Functional value | Fulfilling user desires related to the users' objectives or needs | Sheth et al. (1991), Sweeney and Soutar (2001), Nov (2007) |
| Emotional value | Degree of enjoyment or satisfaction with consumption of the service or product | Sheth et al. (1991), Sweeney and Soutar (2001) |
| Social value | The value in which felt when one's social image is formed in accord with other people's expectations or social norms | Sheth et al. (1991), Sweeney and Soutar (2001), Lai & Turban (2008) |
| Economic value | The difference between the cost of consuming the service or product and the perceptional utility after consuming it | Sweeney and Soutar (2001), Wunsch-Vincent and Vickery (2007), Hargittai & Walejko (2008), Rowley (2008) |

"Functional value" refers to the fulfillment of the desires of a user, which are related to the user's practical objectives or needs(Sheth et al., 1991; Sweeney & Soutar, 2001). Examples of DC offering functional value include the search functionality offered by Google services (Lai & Turban, 2008). This type of DC allows users to readily and conveniently achieve their goals, thereby maximizing users' functional value.

"Emotional value" refers to emotional satisfaction or the level of enjoyment perceived upon the consumption of a product or service (Lai & Turban, 2008; Sweeney & Soutar, 2001; Traw, 2003). Typical emotional value involves positive feelings (such as joy or enjoyment, satisfaction, a good mood, etc.) experienced during such consumption. Digital games are a representative type of DC that offer emotional value (Feijoo et al., 2009; Lai & Turban, 2008; Straker & Wrigley, 2016; Traw, 2003).

"Social value" is the value involving the formation of one's social image in accordance with others' expectations or social norms (Sheth et al., 1991; Sweeney & Soutar, 2001). The social value of DC performs a principal role in elevating

one's social status, enhancing one's relationships with others, and developing one's desired social image within the context of DC use (Heymann, Koutrika, & Garcia-Molina, 2007; Lai & Turban, 2008).

"Economic value" refers to the difference between the cost of consuming the service or product and the perceptional utility experienced after consuming it. The economic value of DC refers to the value of gratification when the price has been rationally established, in accordance with the actual utility of the DC (Hargittai & Walejko, 2008; Rowley, 2008; Sweeney & Soutar, 2001).

**Interaction Value of Digital Content**

Hoffman and Novak (1996) argued that the characteristics of contents - which are associated with the users' visual, aural, and interactive experiences of the contents - can be described in terms of interaction and liveliness. "Interaction", here, is defined as the mutual influence of the acts of users as a component of the process of exchange of meaningful messages by information or other types of communication (Feijoo et al., 2009; Hargittai & Walejko, 2008; Rowley, 2008). In a broad sense, interaction refers to acts that involve other objects, people, and entities within the environment (Stini et al., 2006; Williams et al., 2008). Furthermore, Hoffman and Novak (1996) proposed a communication network structure in which interaction is intertwined between the media and the user, as well as among the users themselves. Interaction is of central importance to the changes occurring within such a communication structure (Shi et al., 2014; Stini et al., 2006; Williams et al., 2008). Increases in interaction are typically associated with satisfaction, promoting the quality of results and reducing the length of time required for the completion of a task (Stini et al., 2006). Therefore, it would appear that interaction is more than merely a one-dimensional concept of communication, and is rather a multi-dimensional concept that encompasses individual communication, responsiveness, feedback, reactive conversation, information sharing, participation, etc. (McMillan & Hwang, 2002).

The interactions perceived by DC users can be divided into three types of interaction: 1) interactions between user and user; 2) interactions between content and user; and 3) interactions between the system and the user (Heymann et al., 2007; Hoffman & Novak, 1996; Rowley, 2008; Stini et al., 2006; Williams et al., 2008). First, user-user interaction refers to the degree of exchange of the roles, as well as to the control of the reciprocal discourse between participants in the communicative process, and also involves interactions between users over a medium (Heymann et al., 2007; Hoffman & Novak, 1996; Stini et al., 2006; Williams et al., 2008). Wunsch-Vincent and Vickery (2007) defined user-user interactions in terms of the level of participation of the users in the real-time alteration of content and of the forms offered by the environment. Yuping and

Shrum (2002) regarded user-user interaction as the level of simultaneous influence and the degree of actions one could compel one's partner to take concerning a message or medium of communication when two or more partners are engaging in communication. Fotin and Dholakia (2015) described user-user interaction as the level of permission provided, that enables an individual or plurality of users to communicate mutually as both senders and receivers. Second, the interaction between contents and users refers to the level of relations between the successor's and predecessor's contents for the serial exchange of communication (Fotin & Dholakia, 2015; Rowley, 2008; Stini et al., 2006; Williams et al., 2008; Wunsch-Vincent & Vickery, 2007). The contents function as a type of communication exchanged by users, with the ultimate objective being perfect interaction (Stini et al., 2006; Williams et al., 2008; Wunsch-Vincent & Vickery, 2007). Third, interaction between the system and users occurs between the system and the people who connect to hypermedia contents, and also refers to the ability of the communication system to respond to the user (Hoffman & Novak, 1996; Stini et al., 2006; Williams et al., 2008). Table 2 summarizes previous studies associated with the interaction of DC, which are reviewed above.

**Table 2. Interaction value of DC**

| Composition | Definition | References |
|---|---|---|
| User-User Interaction | Interaction between the users and the user | Hoffman and Novak (1996), Yuping and Shrum (2002), Fotin and Dholakia (2005), Wunsch-Vincent and Vickery (2007), Williams et al. (2008) |
| Contents-User Interaction | Interaction between the contents and the user | Stini et al. (2006), Wunsch-Vincent and Vickery (2007), Williams et al. (2008) |
| System-User Interaction | Interaction between the system and the user | Hoffman and Novak (1996), Fotin and Dholakia (2005), Stini et al. (2006), Williams et al. (2008) |

**Business Value of Digital Content**

The principle of value creation refers to the manner in which user and business value are created; essentially, value can be created once the source of the value has been discovered (Rowley, 2008). Many different methods can be employed to locate the source of value, including analyses of firms' capabilities, the discovery of novel market or sales opportunities, analyses of distribution channels, applications of innovative technology, etc. (Feijoo et al., 2009; Rowley, 2008). DC basically contains contents designed to deliver value and utility to the user,

and thus users, when accessing DC, experience the value and utility inherent to that DC (Stini et al., 2006). In this research, the business value of DC involves the product value, process value, and user value (Feijoo et al., 2009; Meisel, 2008; Rowley, 2008; Williams et al., 2008).

First, the product value of DC refers to the excellence and quality of the DC, and includes therein the intangible values of a specific product (Feijoo et al., 2009; Stini et al., 2006; Williams et al., 2008). For example, if DC is of superior quality and highly credible, the product value of DC might also be higher (Hargittai & Walejko, 2008; Rowley, 2008). Second, regarding user value, there has been some agreement that value is determined by the user rather than by the supplier. The user value of DC refers to the value enjoyed by users, and includes the DC usefulness as perceived by the user, the user's objectives, and the improved work results (Feijoo et al., 2009; Meisel, 2008; Rowley, 2008; Shin & Lee, 2005; Stini et al., 2006). Third, the process value of DC refers to the ability to save costs, cut back on time, and achieve goals more effectively via the use of DC (Feijoo et al., 2009; Hargittai & Walejko, 2008; Meisel, 2008; Stini et al., 2006). Major examples of DC processes include the DC management process, the DC production process, the DC delivery process, the DC charging process, etc. (Feijoo et al., 2009; Meisel, 2008; Stini et al., 2006; Tsai et al., 2008; Williams et al., 2008). The above review of previous studies relevant to the business value of DC is shown in Table 3.

**Table 3. Business value of DC**

| Composition | Definition | References |
|---|---|---|
| Product value | The superiority and high-quality of DC | Stini et al. (2006), Hargittai & Walejko (2008), Williams et al. (2008), Rowley (2008), Feijoo et al. (2009) |
| User value | The joy felt by users using DC | Shin (2004), Stini et al. (2006), Williams et al. (2008), Meisel (2008), Hargittai & Walejko (2008), Rowley (2008), Feijoo et al. (2009) |
| Process value | Includes savings cost and time, and effective achieving goals by using DC | Stini et al. (2006), Hargittai & Walejko (2008), Tsai et al. (2008), Williams et al. (2008), Meisel (2008), Feijoo et al. (2009) |

# RESEARCH MODEL AND HYPOTHESES

Based on the above review of DC values, this study proposes a model for valuing DC, which consists of the intrinsic, interaction, and business values of DC. The intrinsic value of DC can be decomposed further into functional, emotional, social, and economic value. Moreover, DC interaction value involves the interactions between user and user, content and user, and system and user. Furthermore, DC business value includes the product, user, and process value. Building on this foundation, the objective of this study was to determine whether DC intrinsic value influences DC interaction value, and then whether the DC interaction value, in turn, affects the DC business value. Additionally, this study evaluates the relationships existing among intrinsic, interaction, and business DC values according to the different types of DC business. Figure 1 organizes these concepts, and illustrates the research model.

## Functional Value of DC and DC Interaction Value

Functional value refers to a user fulfilling a desire concerning a practical objective or a need (Sheth et al., 1991; Sweeney & Soutar, 2001). Examples of DC that offers functional value include a Google service with search functionality, Amazon's Kindle ebookshop, etc. (Lai & Turban, 2008; Rowley, 2008). It would appear that the functional value of DC can add value to user-user interactions, content–user interactions, and system-user interactions, as the user's specific objectives can thus be readily and conveniently achieved (Lai & Turban, 2008; Rowley, 2008; Williams et al., 2008). Functional value may be regarded as making it possible for users to exchange meaningful messages thanks to the communication of information, thereby heightening the value of interactions (Feijoo et al., 2009; Rowley, 2008). In line with the background furnished in this review, this research proposes the following hypotheses:

H1: The functional value of DC has a positive (+) influence on interaction between user and user.
H2: The functional value of DC has a positive (+) influence on interaction between contents and users.
H3: The functional value of DC has a positive (+) influence on interaction between the system and users.

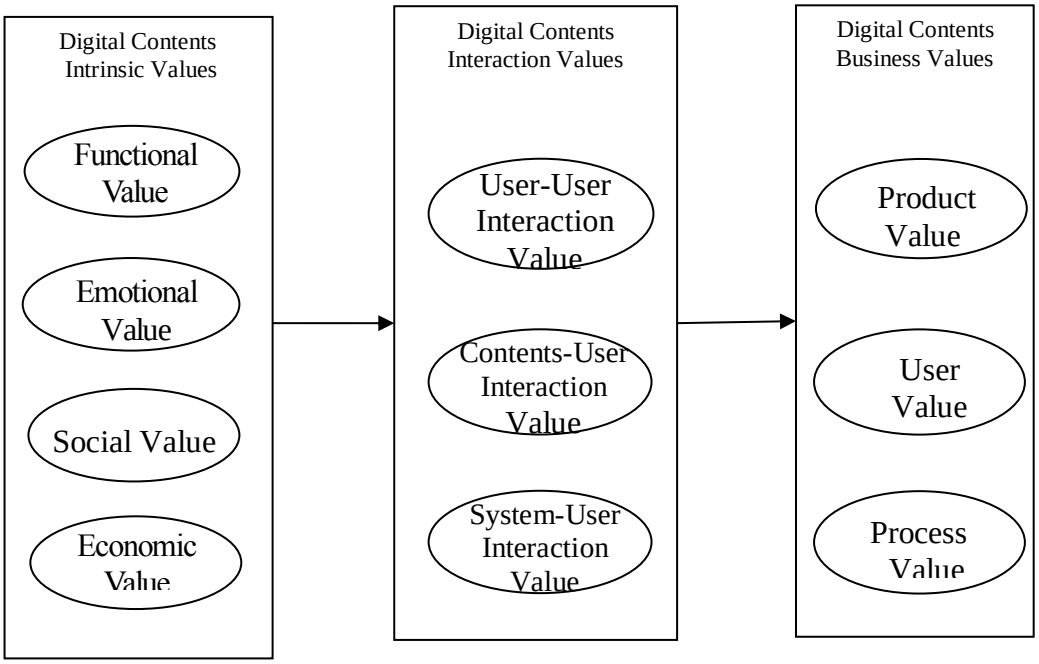



Figure 1. Conceptual model

**Emotional Value of DC and DC Interaction Value**

Webster and Martocchio (1992) asserted that when users feel an emotion toward IT, they tend to be more interested in and more pleased with IT. Venkatesh (2000) also confirmed that when users are entranced by their emotions toward IT, they tend to perceive IT as easy. Therefore, emotional value provides users with a key drive for the spontaneous use of IT, through pleasure and interest (Feijoo et al., 2009). On the other hand, if the emotional value is high, a positive interaction may be the result; the user, in turn, becomes absorbed in interactions such as two-way communication (Stini et al., 2006). It appears that when DC provides emotional value to users, the users tend to use DC with greater frequency. Eventually, these positive effects can improve the degree of interaction among users, contents, systems, etc., which manifest in a variety of different ways (Hargittai & Walejko, 2008; Lai & Turban, 2008). With the background furnished in this review, this study proposes the following hypotheses:

H4: The emotional value of DC has a positive (+) influence on interaction between user and user.

H5: The emotional value of DC has a positive (+) influence on interaction between contents and users.

H6: The emotional value of DC has a positive (+) influence on interaction between the system and users.

### Social Value of DC and DC Interaction Value

Social value is the value perceived when one constructs one's social image to conform to the expectations of other people or to social norms (Lai & Turban, 2008; Sheth et al., 1991; Sweeney & Soutar, 2001). As social value is exchanged (sent and received) by mutual actions occurring within social relationships, social value has become a critically important factor in the lead-up to interaction (Wunsch-Vincent & Vickery, 2007). Recently, social Web sites such as Wikipedia and YouTube have begun to capture and display contents generated by various people, supporting social interactions among multiple users (Heymann et al., 2007). Therefore, it appears that the social value of DC can improve interaction to enhance one's social status, to improve one's relationships with others, and to shape one's desired social image (Feijoo et al., 2009; Lai & Turban, 2008). With the background furnished in this review, this study proposes the following hypotheses:

H7: The social value of DC has a positive (+) influence on interaction between user and user.
H8: The social value of DC has a positive (+) influence on interaction between contents and users.
H9: The social value of DC has a positive (+) influence on interaction between the system and users.

### Economic Value of DC and DC Interaction Value

Economic value refers to the difference between the costs or efforts invested in consumption and the perceived utility of having consumed those products or services. The economic value of DC stands for the value fulfilled by establishing the cost in a rational fashion for the utility provided by the DC (Rowley, 2008; Sweeney & Soutar, 2001; Williams et al., 2008; Wunsch-Vincent & Vickery, 2007). When the user evaluates the quality or value of a product, he tends to consider the monetary and psychological costs invested for the purchase of the product (Rowley, 2008; Williams et al., 2008; Zeithaml, 1988). According to Williams et al. (2008), if the perceived cost is high when people purchase a digital service, it affects the user's perceived value, and also engenders negative feelings regarding the choice of the DC. The economic value should be considered seriously in the context of DC interactions (Feijoo et al., 2009; Rowley, 2008). This is because if the interaction is not sufficiently smooth in terms of content exchange and transactions, the economic value of the DC will necessarily be reduced (Lai & Turban, 2008; Williams et al., 2008; Wunsch-Vincent & Vickery, 2007). With the background furnished in this review, this research proposes the following:

H10: The economic value of DC has a positive (+) influence on interaction between user and user.

H11: The economic value of DC has a positive (+) influence on interaction between contents and users.

H12: The economic value of DC has a positive (+) influence on interaction between the system and users.

**Business Value of DC and DC Interaction Value**

According to Zeithaml (1988), value is determined by interactive preference experiences and by environmentally-based comparative and personal judgments. This characteristic is connected, to some degree, with the product value of DC. This is because the DC basically encompasses the value and utility that can be delivered to the user, such that when the user accesses DC, the user experiences the utility and value inherent to the DC as a digital product (Feijoo et al., 2009; Williams et al., 2008). According to Hoffman and Novak (1996), the increase in interaction between the system and the users, the content and the users, and the users themselves result in satisfaction, improved quality of the outcomes, and a reduction in the amount of time necessary to complete a given task. Moreover, the value of the DC product tends to be delivered by submitting interactive requests and receiving interactive responses (Hui & Chau, 2002; Rowley, 2008). The DC interaction performs a crucial role in users' online experiences, and the consequent increase in interaction improves the user satisfaction, process-efficiency, and quality of the business results (Meisel, 2008; Williams et al., 2008). Therefore, it appears that effective interactions among the user, the content, and the systems can increase the value of DC business (Feijoo et al., 2009; Meisel, 2008). According to the review of previous research, it appears that the degree of interaction has a positive influence on the business value of DC in terms of product, process, and user. Based on this observation, we formulated the following hypotheses:

H13: Interaction between the DC users has a positive (+) influence on the value of DC products.

H14: Interaction between the DC contents and users has a positive (+) influence on the value of DC products.

H15: Interaction between the DC system and users has a positive (+) influence on the value of DC products.

H16: Interaction between the DC users has a positive (+) influence on DC user value.

H17: Interaction between the DC contents and users has a positive (+) influence on DC user value.

H18: Interaction between the DC system and users has a positive (+) influence on DC user value.
H19: Interaction between the DC users has a positive (+) influence on the process value of DC.
H20: Interaction between the DC contents and users has a positive (+) influence on DC process value.
H21: Interaction between the DC system and users has a positive (+) influence on DC process value.

**Types of DC Business and DC Value**

The digital environment has undergone rapid and profound alterations in recent years, and the relevant characteristics of DC businesses are also undergoing significant changes (Williams et al., 2008). This is not only because the general financial level of users has improved and people tend to have more leisure time, but also because the demand for information sharing and entertainment DC has increased sharply (Lang et al., 2009; Williams et al., 2008). According to the characteristics and traits of the DC, this study divided DC business into entertainment DC and information DC, as shown in Table 4.

**Table 4. Types of DC business**

| Type | Purpose | Example |
|---|---|---|
| Information DC | ・Purpose of the acquisition and sharing of digital information | ・e-learning, electronic books, information content, electronic newspaper and journal, etc. |
| Entertainment DC | ・Purpose of entertainment | ・digital games, digital broadcasts, digital movies, digital music, digital animation, etc. |

DC for information permits the acquisition and sharing of information through DC, and includes issues such as electronic newspapers and journals, e-learning, and electronic books (Hui & Chau, 2002). DC for entertainment includes digital games, digital broadcasts, digital movies, digital music, digital animation, etc. By taking advantage of DC, DC users hope to fulfill not only their intellectual, but also their emotional desires. For example, when the user employs information DC, intellectual desires tend to be strengthened; however, when entertainment DC is used, emotional desires tend to be strengthened. Therefore, it would appear that the value of DC varies depending on the type of DC business. Considering the above assumptions, this study proposes the following hypotheses:

H22: The impact of the intrinsic value of DC on the value of DC interaction is likely to differ depending on the type of DC business.
H23: The impact of the interactive value of DC on DC business value is likely to differ depending on the type of DC business.

## EMPIRICAL RESEARCH

### Development of Measurement Scale

The initial set of measurement items was selected by a review of the literature and by reflecting on the constructs specified within the proposed research model. Then, a pilot test of the survey instrument was conducted using a five-point Likert scale, with academicians, practitioners, researchers, and doctoral students with experience using DC to elaborate on the measured items. Feedback by the pilot test allowed for the identification of ambiguity in the wording of the survey items, and also permitted new items to be added. After the completion of the pilot test, the final version of the survey items employed for data collection is shown in Table 5.

**Table 5. Measurement items**

| Factor | Measurement Items | References |
|---|---|---|
| Functional value | This DC offers contents which are appropriate for the purpose I use it for. | Sheth et al. (1991)<br>Sweeney and Souter (2001)<br>Hui & Chau (2002)<br>Lai & Turban (2008) |
| | This DC appropriately satisfies desires. | |
| | Using this DC has helped me reach my goal. | |
| | The range and depth of the information that this DC offers sufficiently satisfies the purpose it is used for. | |
| | The quantity of information offered by this DC sufficiently satisfies the purpose it is used for. | |
| Emotional value | This DC is interesting. | Sheth et al. (1991)<br>Sweeney and Souter (2001)<br>Traw (2003)<br>Lai & Turban (2008)<br>Feijoo et al. (2009) |
| | This DC is so interesting that I lose track of the time. | |
| | Using this DC puts me at ease. | |
| | Using this DC makes me feel good. | |
| | This DC provides me with enjoyment. | |
| Social value | Using this DC improves my social image. | |

| | | |
|---|---|---|
| | Using this DC makes a good impression on people. | Sheth et al. (1991), Sweeney and Souter (2001), Wunsch-Vincent and Vickery, (2007), Heymann et al. (2007), Lai & Turban (2008) |
| | Using this DC is a way to get closer to people. | |
| | Using this DC makes other people envious. | |
| Economic value | The cost to use this DC is reasonable. | Sweeney and Souter (2001), Wunsch-Vincent and Vickery (2007), Rowley (2008), Williams et al. (2008), Feijoo et al. (2009) |
| | The cost to use this DC is economical. | |
| | The value offered by using this DC is reasonable with respect to its cost. | |
| | The cost of acquiring this DC is economical. | |
| Value of interaction between users and users | This DC improves interaction with other people. | Hoffman and Novak(1996), Yuping and Shrum (2002), (Fotin & Dholakia, 2015), Heymann et al. (2007), Wunsch-Vincent and Vickery (2007), Williams et al. (2008) |
| | This DC improves communication amongst its users. | |
| | This DC allows the exchange of a variety of types of information. | |
| | This DC makes exchange between users easier. | |
| | The exchanging of information using this DC is easier. | |
| | This DC improves interaction between users. | |
| Value of interaction between contents and users | Interacting with this DC feels precise and easy to understand. | Stini et al. (2006), Wunsch-Vincent and Vickery (2007), Hargittai & Walejko (2008), Williams et al. (2008), Rowley (2008), Feijoo et al. (2009) |
| | Finding information is fast within this DC. | |
| | The interaction between contents and users of this DC is efficient. | |
| | The interaction between contents and users of this DC is fast. | |
| Value of interaction between the system and users | Accessing this DC system when I need to is easy. | Hoffman and Novak (1996), Fotin and Dholakia (2005), Stini et al. (2006), Williams et al. (2008), Rowley (2008), |
| | This DC system is safe overall. | |
| | Overall, this DC system is convenient to use. | |

| | | |
|---|---|---|
| | The way this DC system is used is easy to learn. | Feijoo et al. (2009) |
| | It is easy to get accustomed to using this DC system. | |
| | Using this DC system is expedient. | |
| Product value | This DC is trustworthy. | Hui & Chau (2002), Stini et al. (2006), Hargittai & Walejko (2008), Williams et al. (2008), Rowley (2008), Feijoo et al. (2009) |
| | This DC is of good quality. | |
| | This DC is excellent. | |
| | This DC is accurate. | |
| | The quality of this DC has a good reputation. | |
| User value | Overall, use of this DC helps me achieve fruitful results which help me reach my goals. | Shin and Lee (2005)<br>Stini et al. (2006)<br>Hargittai & Walejko (2008)<br>Meisel (2008)<br>Rowley (2008)<br>Williams et al. (2008)<br>Feijoo et al. (2009) |
| | Using this DC in order to achieve my goals improves overall productivity. | |
| | In the end, this DC makes it possible for me to reach my goals more effectively. | |
| | Overall, this DC is helpful when it comes to achieving my ultimate goals. | |
| | Using this DC makes it possible for me to achieve my goals quicker. | |
| | Using this DC makes it easier for me to achieve my goals. | |
| Process value | Using this DC saves time. | Hui & Chau (2002)<br>Stini et al. (2006), Hargittai & Walejko (2008), Williams et al. (2008), Meisel (2008), Feijoo et al. (2009) |
| | Using this DC cuts back on expenses. | |
| | This DC offers an efficient process. | |
| | It is possible to achieve my goals through optimal process by utilizing this DC. | |

## Sampling and Data Collection Methods

The survey was carried out for about four months period by emailing the survey questionnaire, and visiting middle schools, high schools, universities, employee training facilities, research centers, and businesses. The survey was targeted to people with experience in the use of DC. A total of 2,100 copies of the questionnaire were distributed, 700 copies of which were returned, corresponding to a recovery rate of 33%. Among these, with an exception of the insincere

answers (66 people) and the responses of 66 people with no experience with DC, 574 surveys (usability rate 82%) were ultimately employed for empirical analysis.

**Demographic Analysis**

In this study, we conducted demographic statistical analyses of 574 respondents. As can be observed in Table 6, first, 51.7% of the respondents were male and 48.3% were female. 36.8% were between 20-25 years of age, 23.7% between 26-30, and 20.4% between 31-40. Moreover, 39.99% were university graduates, 37.5% were currently university students, and 9.4% reported that their highest level of education was “high school graduate”. As for occupation, 47.2% of the respondents were students and 52.8% did office work, and among the latter category 26.8% worked for private businesses, 9.8% worked in specialties, and 8.9% were public servants. Further, 47.9% earned less than 10,000 dollars per year, and 52.1% made more than 10,000 dollars per year. With regard to questions associated with the frequency of DC use, 28.4% utilized DC between 11-20 times a month, 27.2% less than 20 times per month, and 26.7% more than 30 times per month. Moreover, 44.3% had used DC for longer than 5 years, 24.4% for 2-5 years, and 13.1% for 1-2 years. Monthly usage rates for DC were less than 10 dollars (45.6%), no charge (21.8%), and 10 -30 dollars (20.2%). The forms of DC business were 41.0% information type, and 59.0% entertainment type.

**Table 6. Demographic analysis**

| Category | | Frequency | % | Category | | Frequency | % |
|---|---|---|---|---|---|---|---|
| Age | < 19 | 55 | 9.6 | Gender | Male | 297 | 51.7 |
| | 20-25 | 211 | 36.8 | | Female | 277 | 48.3 |
| | 26-30 | 136 | 23.7 | | Total | 574 | 100 |
| | 31-40 | 117 | 20.4 | Usage count | < 10/mo. | 156 | 27.2 |
| | > 40 | 55 | 9.6 | | 11-20/mo. | 163 | 28.4 |
| | Total | 574 | 100 | | 21-29/mo. | 102 | 17.8 |
| Education | In primary school | 54 | 9.4 | | > 30 | 153 | 26.7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | High school graduate | 16 | 2.8 | | Total | 574 | 100 |
| | University student | 215 | 37.5 | Length of use | < 6 months | 62 | 10.8 |
| | University graduate | 229 | 39.9 | | 6-12 months | 43 | 7.5 |
| | In graduate school | 38 | 6.6 | | 1-2 years | 75 | 13.1 |
| | Graduated graduate school | 22 | 3.8 | | 2-5 years | 140 | 24.4 |
| | Total | 574 | 100 | | > 5 years | 254 | 44.3 |
| Occupation | Student | 271 | 47.2 | | Total | 574 | 100 |
| | Office worker | 154 | 26.8 | Usage fee | Free | 125 | 21.8 |
| | Public servant | 51 | 8.9 | | < 10 $ | 262 | 45.6 |
| | Self-employed | 38 | 6.6 | | 10-30 $ | 116 | 20.2 |
| | Housewife | 4 | 0.7 | | 30-50 $ | 47 | 8.2 |
| | Specialist | 56 | 9.8 | | 50-100 $ | 20 | 3.5 |
| | Total | 574 | 100 | | > 100 $ | 4 | 0.7 |
| Yearly income | < 10,000 $ | 275 | 47.9 | | Total | 574 | 100 |
| | 10-30,000 $ | 167 | 29.1 | Business type | Information | 235 | 41.0 |
| | 30-50,000 $ | 80 | 13.9 | | Entertainment | 339 | 59.0 |
| | > 50,000 $ | 52 | 9.1 | | Total | 574 | 100 |

## Analysis of Reliability and Validity

This study made great efforts to maximize its validity by interviewing industry specialists, academicians, researchers, and people working in the DC field prior to the administration of the survey. Moreover, to increase internal viability, a pilot-test was conducted before executing the survey, and this test was then employed as a reference when developing the final survey questionnaire. Furthermore, factor analysis was conducted in this research to evaluate validity and a varimax for factor rotation was selected among the methods of perpendicular rotation. As an eigenvalue was employed as the standard for determining the number of factors, more than one eigenvalue factor was selected. The results of the factor analysis are provided in Table 7. The construct validity is ensured because the factor loading was above 0.5, and because the accumulative distribution of all the ingredients was 62.957%, which is regarded as sufficient explanatory power.

Reliability analysis was executed against the Cronbach's Alpha coefficient, which is employed to evaluate internal consistency. As can be seen in Table 7, the reliability of the variables used in the measurements of this research demonstrates that they are all above 0.7, which is regarded as good convergent validity and internal consistency. The results show that the constructs exhibit sufficient reliability and convergent validity for further analysis.

**Table 7. Results of reliability and validity analysis**

| Construct | Factor Group | | | | | | | | | | | Reliability |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| SI4 | .780 | .132 | .119 | .039 | .119 | .130 | .099 | -.047 | .042 | .023 | .133 | 0.883 |
| SI2 | .775 | .068 | .091 | .060 | .045 | .142 | .021 | .002 | -.007 | .042 | .058 | |
| SI5 | .731 | .090 | .095 | .093 | .183 | .087 | .080 | -.131 | .004 | .117 | .182 | |
| SI6 | .726 | .098 | .057 | .106 | .103 | .110 | .186 | -.072 | .018 | .135 | .177 | |
| SI3 | .678 | .159 | .023 | .129 | .242 | .114 | .105 | .077 | .050 | .050 | .013 | |
| SI1 | .629 | .065 | .076 | .096 | .175 | .097 | .131 | -.096 | -.024 | .142 | .413 | |
| UV4 | .058 | .795 | .107 | .037 | .095 | .147 | .025 | .061 | .050 | .136 | .116 | 0.895 |
| UV3 | .129 | .787 | .089 | .075 | .112 | .056 | .062 | .074 | .075 | .125 | .137 | |
| UV2 | .080 | .734 | .069 | .020 | .083 | .030 | .086 | .217 | .134 | .096 | .087 | |
| UV1 | .199 | .732 | .035 | .051 | .193 | .121 | .086 | .183 | .054 | .065 | .069 | |
| UV5 | .115 | .703 | .158 | -.047 | .092 | .161 | .052 | .017 | .072 | .299 | .020 | |
| UV6 | .110 | .662 | .194 | -.024 | .149 | .157 | .023 | .034 | .044 | .326 | .067 | |
| UI4 | .106 | .051 | .787 | .082 | .076 | -.001 | .073 | -.012 | .028 | .085 | .077 | 0.862 |
| UI6 | .027 | .042 | .762 | .009 | .041 | .090 | .009 | .105 | .112 | .125 | .099 | |
| UI2 | .030 | .179 | .756 | .055 | -.073 | .010 | -.046 | .232 | .056 | -.025 | -.028 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UI5 | .113 | .024 | .754 | .085 | .075 | .045 | .050 | -.116 | -.010 | .155 | .097 | |
| UI1 | .041 | .080 | .716 | .091 | -.039 | -.012 | -.038 | .233 | .024 | -.061 | .035 | |
| UI3 | .114 | .143 | .689 | -.030 | -.020 | .066 | .021 | .013 | .048 | .065 | .065 | |
| EM4 | .076 | .031 | .003 | .818 | .149 | .093 | .068 | .176 | .009 | -.010 | .066 | |
| EM2 | .057 | .003 | .095 | .793 | .049 | .151 | .077 | .052 | .160 | .025 | .006 | |
| EM5 | .133 | -.036 | .103 | .756 | .124 | .154 | .056 | .032 | -.020 | -.066 | .032 | 0.856 |
| EM3 | .097 | .084 | .000 | .720 | .114 | .108 | .025 | .245 | .067 | .028 | .094 | |
| EM1 | .125 | .042 | .130 | .674 | .077 | .306 | .043 | -.154 | .063 | -.027 | .045 | |
| PV3 | .141 | .151 | -.015 | .144 | .768 | .086 | .089 | .104 | .098 | .139 | .001 | |
| PV5 | .128 | .079 | -.036 | .062 | .714 | .135 | .065 | .132 | .071 | .007 | .260 | |
| PV4 | .187 | .160 | .064 | .148 | .694 | .066 | .117 | .054 | .162 | .132 | .024 | 0.845 |
| PV1 | .202 | .096 | -.061 | .110 | .651 | .283 | .108 | .062 | .063 | .007 | .028 | |
| PV6 | .140 | .143 | .089 | .087 | .638 | .131 | .059 | .029 | .185 | -.027 | .134 | |
| FU1 | .210 | .171 | .085 | .181 | .190 | .696 | .071 | -.034 | -.077 | .022 | .022 | |
| FU2 | .194 | .057 | .088 | .291 | .182 | .670 | .063 | -.024 | -.023 | -.017 | .074 | |
| FU4 | .101 | .088 | -.012 | .165 | .170 | .665 | .131 | .111 | .128 | .152 | .120 | 0.812 |
| FU5 | .089 | .077 | .099 | .172 | .090 | .657 | .119 | .063 | .042 | .135 | .189 | |
| FU3 | .141 | .284 | -.016 | .092 | .090 | .650 | .018 | .129 | -.020 | .101 | .028 | |
| EC2 | .124 | .051 | .022 | .002 | .104 | .034 | .874 | .047 | -.030 | .040 | .056 | |
| EC1 | .141 | -.013 | .037 | .002 | .078 | .017 | .831 | .065 | -.044 | .038 | -.020 | 0.838 |
| EC5 | .050 | .099 | -.011 | .187 | .094 | .120 | .716 | .013 | .103 | .072 | .145 | |
| EC3 | .210 | .133 | .026 | .084 | .116 | .184 | .711 | .053 | .059 | .050 | .066 | |
| SO2 | .001 | .197 | .105 | .045 | .089 | .091 | .043 | .817 | .026 | .088 | -.025 | |
| SO1 | -.043 | .148 | .047 | .049 | .048 | .119 | .046 | .777 | .128 | .058 | .063 | 0.793 |
| SO4 | -.205 | .052 | .096 | .124 | .109 | -.063 | .073 | .670 | .188 | .123 | -.009 | |
| SO3 | .007 | .102 | .385 | .204 | .096 | .047 | .040 | .577 | -.082 | -.059 | -.028 | |
| PC8 | .039 | .094 | .104 | .053 | .162 | .000 | .009 | .108 | .885 | .014 | .008 | |
| PC7 | .050 | .054 | .081 | .074 | .218 | .040 | .031 | .059 | .848 | .044 | .040 | 0.862 |
| PC9 | .018 | .163 | .042 | .094 | .087 | -.005 | .018 | .085 | .789 | .102 | .005 | |
| RV2 | .089 | .167 | .084 | -.036 | .025 | .042 | .188 | .154 | .082 | .759 | .083 | |
| RV1 | .146 | .312 | .113 | -.086 | .056 | .130 | .039 | .044 | .035 | .728 | .070 | 0.819 |
| RV4 | .115 | .324 | .083 | .025 | .105 | .113 | -.009 | .025 | .083 | .650 | .176 | |
| RV3 | .209 | .465 | .127 | .066 | .100 | .128 | .000 | .040 | -.001 | .592 | .054 | |
| CI3 | .305 | .186 | .122 | .083 | .108 | .143 | .063 | -.026 | -.003 | .128 | .742 | |
| CI2 | .314 | .172 | .150 | .062 | .147 | .216 | .059 | -.003 | -.070 | .132 | .700 | 0.774 |
| CI4 | .381 | .131 | .097 | .030 | .301 | .017 | .107 | .118 | .043 | .078 | .603 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CI1 | .277 | .113 | .273 | .125 | .063 | .132 | .110 | .050 | .188 | .047 | .559 | |
| eigenvalue | 13.024 | 4.156 | 3.584 | 3.191 | 2.334 | 2.240 | 1.637 | 1.471 | 1.284 | 1.165 | 1.034 | |
| Accumulative Distribution (%) | 24.118 | 31.814 | 38.451 | 44.361 | 48.684 | 52.832 | 55.864 | 58.587 | 60.966 | 63.122 | 65.037 | |

FU; Functional Value, EM; Emotional Value, SO; Social Value, EC; Economic Value, UI; User-User Interaction,
CI; Contents-User Interaction, SI; System-User Interaction, PV; Product Value, UV; User Value, RV; Process Value

## Research Model Evaluation

Before testing the research hypotheses, it was first required that the fitness of the model be evaluated in regard to the relationships between the variables. The evaluation of the goodness of fit of the model employed absolute fit measures, incremental fit measures, parsimonious fit measures, etc. Absolute fit measures were evaluated using Chi-square, GFI (Goodness of Fit Index), RMR (Root Mean square Residual), and RMSEA (Root Mean Square Error of Approximation) to assess the overall conformity of the model. Incremental fit measures were assessed using NFI (Normed Fit Index), CFI (Comparative Fit Index), and TLI (Turker-Lewis Index), which were used to evaluate the model's conformity. Parsimonious fit measures were employed (Normed Chi-square) to evaluate the conformity of the proposition model (Bentler, 1990).

**Table 8. Goodness of fit of the research model**

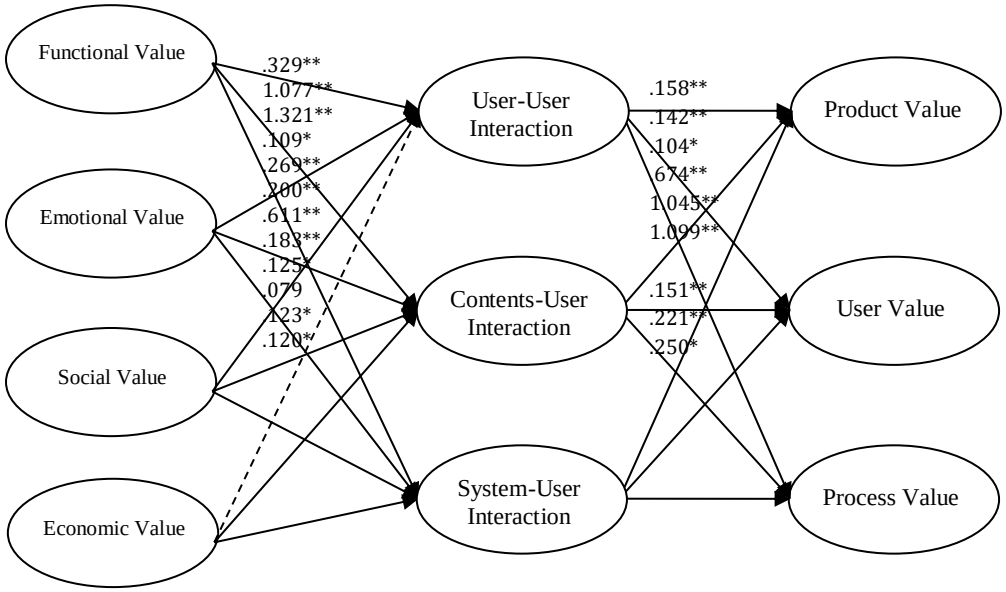
| Chi-square | DF | P-Value | CMIN/DF | RMR | GFI | NFI | CFI | TLI | RMSEA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | LO90 | HO90 |
| 1216.744 | 736 | .000 | 1.653 | .036 | .909 | .902 | .958 | .951 | .034 | |
| | | | | | | | | | .030 | .037 |

Table 8 shows the results of our analysis of the goodness of fit of the model, using covariance structure modeling analysis. Although our analysis of the goodness of fit showed that a P value of 0.000 in relation to $X^2$ did not meet the standard; this was, in actuality, a rather sensitive reflection of the large sample size and complexity of the model. In this case, NC, RMR, GFI, NFI, CFI, TLI, RMSEA, etc. were appropriate for use in evaluating the goodness of fit of the model (Bagozzi & Yi, 1988; Bearden, Sharma, & Teel, 1982). The conformity indices of

this research were as follows: NS=1.653, RMR=0.036, GFI=0.909, NFI=0.902, CFI=0.958, TLI=0.951, RMSEA=0.034 (LO90=0.030, HO90=0.037), and thus the overall goodness of fit of the model was adjudged satisfactory for further empirical analysis.

**Testing Hypotheses**

Hypothesis tests were conducted to evaluate the effects of the intrinsic value of DC on the interaction value of DC, as well as the influence of the interaction value of DC on DC business value. Figure 2 shows the results of the hypotheses tests, and an explanation of the results of this research is provided as follows:




**p<0.01, *p<0.05

Figure 2. Hypotheses test for whole data

The DC functional value was demonstrated to influence interactions between DC users, between contents and users, and between the system and users. Therefore, H1, H2, and H3 were all accepted. The research results demonstrate that, because the DC functional value enables the concrete goals of users to be readily and conveniently achieved, the functional value of DC increases the levels of interaction between DC users, the contents and users, and the system and users. In short, the functional value renders it possible for users to exchange meaningful contents through wired- or wireless- network channels, and thus it appears to increase the value of DC interactions.

The emotional value of DC has been shown to affect interactions between DC users, between contents and users, and between the system and users. Thus, H4, H5, and H6 were all supported. Emotional value provides users with enjoyment and amusement, which increases the experience of affirmative interaction, and consequently increases the interaction of communications between users, contents, and systems. In short, when DC provides the users with good emotional value, the users will generally tend to use DC with greater frequency.

The social value of DC influenced interactions between DC users, between contents and users, and between the system and users. H7, H8, and H9 were all supported. The research results show that social value exerts a mutual impact on actions occurring in social relationships, and thus we can confirm that social value is a crucial factor with regard to DC interaction. In summary, it appears that the social value of DC tends to facilitate the DC interaction to boost one's social status, to improve one's relationship with others, and to shape effectively one's desired social image.

The economic value of DC was demonstrated to influence interactions between DC contents and users and interactions between the system and users, and thus hypotheses H11 and H12 were supported; however, H10 was discarded because it did not affect interactions between users. This means that when the price of DC is rationally established, as compared to the utility offered by the DC, content-user interactions and system-user interactions are increased. In summary, according to the results of previous empirical studies, it appears that the smoothness of the interaction between the system-users and the content-users is related inversely to the psychological and monetary costs perceived by users. However, economic value was not shown to be associated with user-user interactions.

Hypotheses H13, H14, H15, H16, H17, H18, H19, H20, and H21 were all accepted in this study, because the user-user, contents-user, and system-user interactions were shown to influence the product, user, and process values. This finding is consistent with the findings described by Hoffman and Novak (1996), and demonstrates that DC interaction value and business value are very significantly related. In summary, it is apparent that an increase in user-user, contents-user, and system-user interactions induces the growth of the DC business value, thereby not only improving user satisfaction, process-efficacy, and DC product quality, but also reducing the process time required and increasing the DC product value when users access and use the DC. Table 9 summarizes the overall results of hypothesis testing using the entirety of the data.

**Table 9. Hypotheses tests for the entirety of the data**

| Hypothesis | | | Estimate | S.E. | C.R. | P | Results | |
|---|---|---|---|---|---|---|---|---|
| User-user interaction | ---> | Product value | .158** | .038 | 4.099 | .000 | H13 | accepted |
| Contents-user interaction | ---> | | .674** | .082 | 8.257 | .000 | H14 | accepted |
| System-user interaction | ---> | | 151** | .046 | 3.313 | .000 | H15 | accepted |
| User-user interaction | ---> | User value | .142** | .040 | 3.527 | .000 | H16 | accepted |
| Contents-user interaction | ---> | | 1.045** | .107 | 9.802 | .000 | H17 | accepted |
| System-user interaction | ---> | | .221** | .063 | 3.515 | .000 | H18 | accepted |
| User-user interaction | ---> | Process value | .104* | .046 | 2.273 | .023 | H19 | accepted |
| Contents-user interaction | ---> | | 1.099** | .121 | 9.106 | .000 | H20 | accepted |
| System-user interaction | ---> | | .250** | .075 | 3.348 | .000 | H21 | accepted |

**$p<0.01$, *$p<0.05$

## Hypotheses Test per DC Business Type

For informational DC, Figure 3 demonstrates that while functional value influences all interaction value types, emotional value exerts no impact on the value of interaction. Furthermore, social value has been shown not to influence the interaction value between systems and users. It also appears that economic value did not affect the user-user interaction value. Although the content-user interaction value was closely associated with all types of DC business values, the system-user interaction value affected only the product value, and the user-user interaction value was strongly associated with both the user value and the process value.

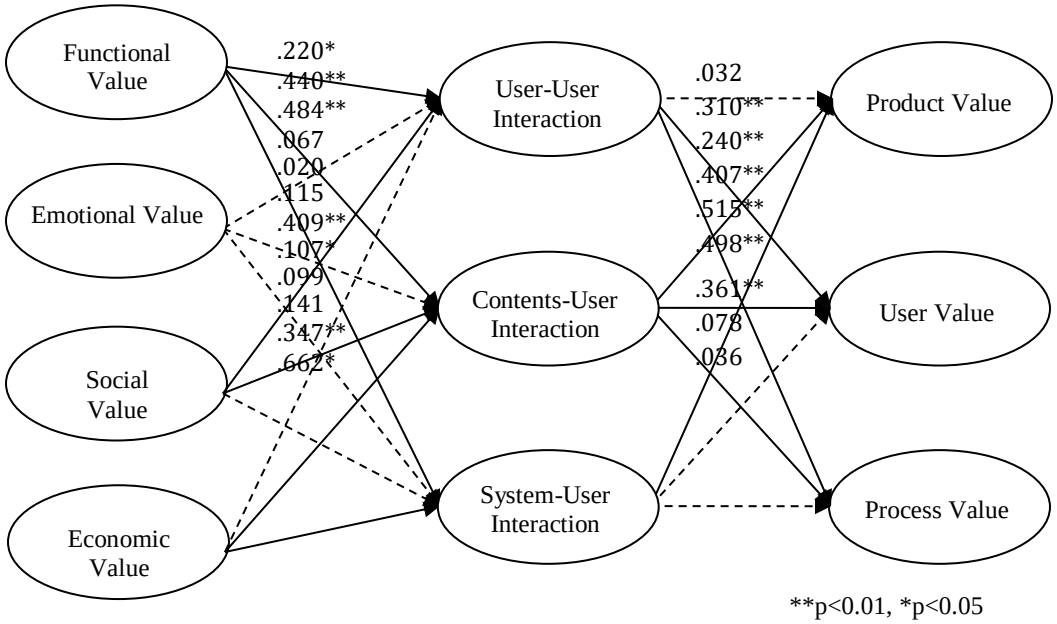



Figure 3. Results of analyzing information DC

On the other hand, the results of our analysis of entertainment DC is shown in Figure 4. Both functional value and social value influenced all interaction values, whereas the economic value had no effect on any interaction value. Moreover, emotional value exerted no detectable effects on the value of user-user interaction. Furthermore, both content-user interaction and system-user interaction were strongly positively related with all types of DC business value in terms of the DC product, process, and user.

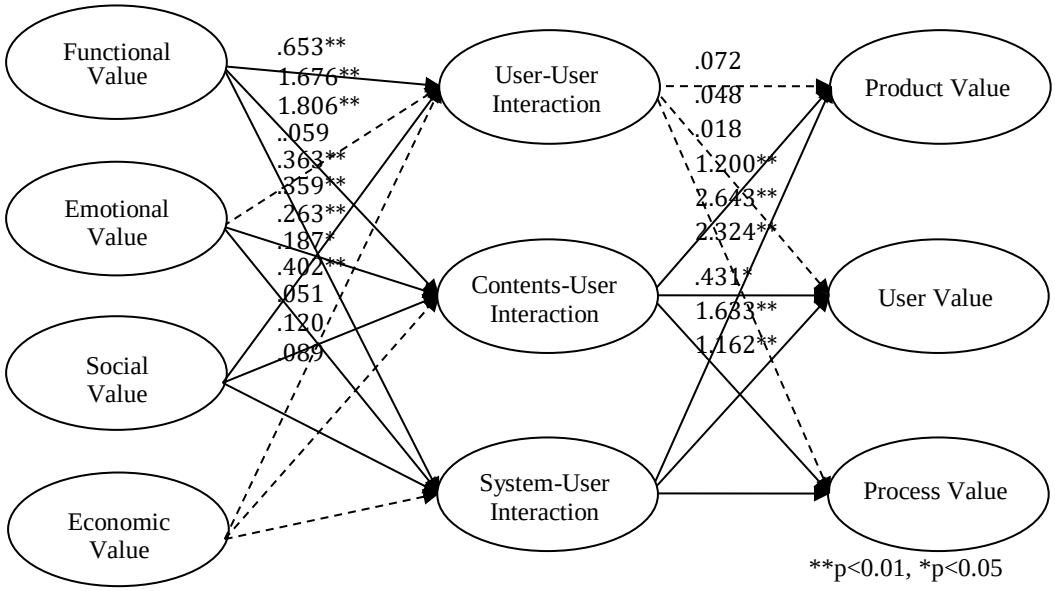



Figure 4. Results of analyzing entertainment DC

Among the results of our investigations into various DC business types, it is worth noting that the emotional value of DC intrinsic value clearly influences the interaction value of DC, but only in relation to the entertainment type of DC. However, economic value was associated with content-user interactions as well as the system and user interaction value of information-type DC only. It can be inferred that when DC users use information DC, intellectual desires are strengthened; additionally, when the users employ the entertainment type of DC, the emotional value is elevated. Furthermore, only the value of user-user interaction had a profound effect on DC business value for informational DC. The value of system-user interaction was associated with all types of DC business value under entertainment DC, but only with the product value of information DC. According to our empirical results, it can be argued that user-user interactions are important when sharing or searching for informational DC; additionally, the value of the user-user interaction was closely associated with the process value and user value within the broader context of DC business value. Further, it was demonstrated that for entertainment DC, the value of DC business was heightened with the efficient and fast interaction between contents and users, as well as the safer and smoother operation of the system. Table 10 summarizes the results of hypothesis testing with different DC business types.

**Table 10. Results of testing hypotheses per dc business type**

| DC value | | | Information DC | | | | Entertainment DC | | | | C.R. applicability difference |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Estimate | S.E. | C.R. | Label | Estimate | S.E. | C.R. | Label | |
| FU | → | UI | 0.220** | 0.098 | 2.243 | par_49 | 0.653** | 0.205 | 3.184 | par_118 | 1.905 |
| | → | CI | 0.440** | 0.086 | 5.137 | par_51 | 1.676** | 0.248 | 6.764 | par_120 | 1.597 |
| | → | SI | 0.484** | 0.095 | 5.102 | par_52 | 1.806** | 0.243 | 7.440 | par_121 | 1.599 |
| EM | → | UI | 0.067 | 0.074 | 0.916 | par_53 | 0.059 | 0.105 | 0.559 | par_122 | 0.068 |
| | → | CI | 0.020 | 0.056 | 0.367 | par_50 | 0.363** | 0.081 | 4.473 | par_119 | 3.481** |
| | → | SI | 0.115 | 0.067 | 1.710 | par_54 | 0.359** | 0.088 | 4.070 | par_123 | 4.274** |
| SO | → | UI | 0.409** | 0.078 | 5.249 | par_55 | 0.263** | 0.101 | 2.595 | par_124 | 1.146 |
| | → | CI | 0.107* | 0.052 | 2.072 | par_56 | 0.187* | 0.074 | 2.529 | par_125 | 3.260** |
| | → | SI | 0.099 | 0.061 | 1.608 | par_57 | 0.402** | 0.088 | 4.561 | par_126 | 2.823* |
| EC | → | UI | 0.141 | 0.149 | 0.945 | par_58 | 0.051 | 0.371 | 0.137 | par_127 | 0.026 |
| | → | CI | 0.347** | 0.133 | 2.609 | par_59 | 0.120 | 0.261 | 0.462 | par_128 | 4.715** |
| | → | SI | 0.662** | 0.189 | 3.510 | par_60 | 0.089 | 0.305 | 0.293 | par_129 | 5.703** |
| UI | → | PV | 0.032 | 0.050 | 0.638 | par_61 | 0.072 | 0.046 | 1.547 | par_130 | 0.587 |
| | → | UV | 0.310** | 0.061 | 5.059 | par_62 | 0.048 | 0.057 | 0.842 | par_131 | 4.272** |
| | → | RV | 0.240** | 0.063 | 3.787 | par_63 | 0.018 | 0.063 | 0.286 | par_132 | 2.892* |
| CI | → | PV | 0.407** | 0.078 | 5.254 | par_64 | 1.200** | 0.279 | 4.299 | par_133 | 2.736* |
| | → | UV | 0.515** | 0.090 | 5.740 | par_65 | 2.643** | 0.512 | 5.159 | par_134 | 4.092** |
| | → | RV | 0.498** | 0.095 | 5.258 | par_66 | 2.324** | 0.463 | 5.020 | par_135 | 3.863** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SI | → | PV | 0.361** | 0.056 | 6.454 | par_67 | 0.431** | 0.213 | 2.020 | par_136 | 3.593** |
| | → | UV | 0.078 | 0.057 | 1.366 | par_68 | 1.633** | 0.396 | 4.125 | par_137 | 4.278** |
| | → | RV | 0.036 | 0.061 | 0.596 | par_69 | 1.162** | 0.352 | 3.301 | par_138 | 3.354** |

**p<0.01, *p<0.05

※ FU: Functional Value, EM: Emotional Value, SO: Social Value, EC: Economic Value, UI: User-User Interaction Value, CI: Contents-User Interaction Value, SI: System-User Interaction Value, PV: Product Value, UV: User Value, RV: Process Value

## CONCLUSIONS AND IMPLICATIONS

In an effort to introduce a new academic agenda and to address new practical guidelines that are relevant to DC value, this study attempted to evaluate the relationship between DC intrinsic value, interaction value, and business value, and then to reflect it by producing new insights for further research and for the design of value-added DC businesses. In particular, as Web 2.0 users tend to value interaction more than technology, it may prove fruitful to concentrate on the value of interactions with users, contents, and systems. It is also important to understand the value of digital content businesses, such that DC businesses can achieve sustained levels of strong growth, and lead the global competitive market. In performing this investigation, we initially divided DC value into intrinsic, interaction, and business value as three major factor groups for the evaluation of DC value. Furthermore, the intrinsic DC value was decomposed into functional, emotional, social, and economic values. Moreover, the DC interaction value was considered to encompass user-user interaction value, contents-user interaction value, and system-user interaction value. Finally, DC business value was considered to encompass product value, user value, and process value.

### Academic Implications

This study has important academic implications for the current body of knowledge regarding DC value. First, this study empirically identified DC value as being composed of intrinsic, interactive, and DC business values. According to the research model developed and described herein, this study empirically evaluated the effects of intrinsic DC value on the DC interaction value and the effect of the DC interaction value on the DC business value.

The second implication gleaned from our analysis of the entirety of the data is that the intrinsic DC values--functional value, emotional value, social value, and economic value--affected the DC user-user, contents-user, and system-user interactions, with the exception of the relationship between the DC economic value and the user-user interactions. Therefore, we can observe that when the intrinsic values of DC correspond closely to the interactions with users, contents, and systems, the DC interaction value is elevated in a commensurate fashion. This research also demonstrates that DC user-user, contents-user, and system-user interactions were all associated with the product, user, and process value of the DC business. In brief, the results of our study confirm that an increase in user-user, contents-user, and system-user interaction values enhances DC product quality, user satisfaction, and process effectiveness.

Another implication of this study is that the DC value evaluation model was applied to two types of DC business: information DC and entertainment DC; thus, the explanatory power of the model was confirmed. According to the research findings generated thus far, it would appear that there are some differences and some similarities between the values of the two types of DC.

First, different factors influence the DC interaction value and the DC business value. That is, the emotional value is closely associated with content-user interactions and system-user interactions only in the case of entertainment DC, whereas the economic value was associated only with contents-user interactions and system-user interactions in the case of information DC. These results suggest that users of entertainment DC appear to focus relatively heavily on emotional issues, whereas information DC users tend to concentrate more closely on economic issues. It might, then, be inferred that when users use DC for informational purposes, intellectual desires increase; conversely, when entertainment DC is used, emotional desires are heightened.

Second, user-user interaction value was related only to business value in the information DC type. It could be inferred that user-user interactions are more important for the information DC type, when searching for or sharing information; thus, the value of this interaction increases the user and process value of information DC.

Third, whereas the system-user interaction value was closely associated with all types of DC business value in the entertainment type of DC, it has an impact only on the product value of information DC. In relation to this, for entertainment DC, as the system stabilizes and begins to operate more smoothly, the DC business values of product, user, and process mount steadily. Therefore, we can surmise

that users of entertainment DC will tend to put a premium on stable system operation and support when they access and use entertainment DC businesses.

Fourth, there appear to be some similarities in the application of DC value evaluations between information DC and entertainment DC. That is, functional value was identified as a common facilitator of the interaction of users, contents, and systems for both types of DC. Moreover, DC business value was commonly affected by content-user interactions for both types of DC. It may be asserted that in this connection, this research finding paves the way for other researchers who wish to explore the research subject in greater detail, including functional value and content-user interactions.

## Managerial Implications

The results of our empirical research into the evaluation of DC value provide us with some important managerial implications. First, this research proposed a DC value evaluation model appropriate for the assessment of a variety of DC business types. The DC value evaluation model will enable DC businesses to evaluate the DC value best suited to their DC business environment, thereby allowing for effective investments and significant time savings when allocating the limited resources of organizations.

Second, from a practical perspective, the ability of a DC to satisfy users should consider thoroughly not only functional, emotional, social and economic value, but also the interactions between users, contents, and systems. The empirical findings show clearly that when the DC intrinsic value and interaction value are fully realized, the product, user, and process values of DC are also improved. In particular, as functional value and contents-user interactions appear to be common factors that critically influence the business values of both types of DC, DC businesses should attempt to ensure successful competitive performance for organizations.

Third, DC businesses must seek strategies for empowering and engaging DC users. In reference to the DC value evaluation model, the competitiveness of the DC business could be improved via the implementation of a systematic and solid DC development plan, which is centered on the user's perspective, as opposed to the developer's perspective.

## Limitations and Future Research Directions

Despite all contributions suggested, this paper was also limited in several regards. First, there exists an urgent need to apply the DC valuing model to many different types of DC businesses, including digital games, digital animation, digital music, digital broadcasting, etc. In this way, similarities and differences between

different types of DC business can be evaluated. Secondly, research into the relationship between the value of DC interaction and DC usage effect would be welcomed, and would facilitate a greater understanding of the implications of this study. Thirdly, research into the relationship between DC intrinsic value and DC business value would be productive if it involves an evaluation of the cross-relationships existing between them. It would also be useful to determine what types of DC intrinsic values are closely associated with DC business value. Finally, despite these limitations, we hope that the proposed model for the evaluation of DC value will prove useful in obtaining further research insights and in gaining a clearer understanding of the systematic structure of digital content value.

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