

Spring 3-24-2010

DIGITAL EXPERIENCE PRODUCTS: A REVIEW

Shariffah Zamoon

Kuwait University, szamoon@gmail.com

Robert Pooley

Heriot-Watt University Edinburgh, R.J.Pooley@hw.qac.uk

Follow this and additional works at: <http://aisel.aisnet.org/ukais2010>

Recommended Citation

Zamoon, Shariffah and Pooley, Robert, "DIGITAL EXPERIENCE PRODUCTS: A REVIEW" (2010). *UK Academy for Information Systems Conference Proceedings 2010*. 51.
<http://aisel.aisnet.org/ukais2010/51>

This material is brought to you by the UK Academy for Information Systems at AIS Electronic Library (AISeL). It has been accepted for inclusion in UK Academy for Information Systems Conference Proceedings 2010 by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

DIGITAL EXPERIENCE PRODUCTS: A REVIEW¹

Shariffah Zamoon

Department of Quantitative Methods and Information Systems, Kuwait University

P.O. Box 5486, Safat, Kuwait, 13055, Kuwait

Telephone: 07787756140, Fax:

Email: szamoon@gmail.com

Robert Pooley

School of Mathematical and Computer Sciences, Heriot-Watt University (Edinburgh)

Abstract

With the dramatic increase in sales based on digital media, much conventional wisdom concerning supply chains and marketing seems to be under challenge. Terms arise and shift meaning, without a clear framework within which we can build theories and understanding. This paper uses the term digital experience product for the class of items in which we are interested. It justifies this by examining all three aspects of such items. They are digital because that is how they are realized. They are experience products because their value is in the experience they provide. They are products, since they can be exchanged as items which are then owned, or licensed, or used/ experienced by a different person(s). Having reviewed these underlying concepts, a full and unambiguous definition is achieved and it is possible to define a direction for future research. The paper concludes with a look forward to where this will take researchers.

Keywords: Digital Experience Products, Digital Economy, Human Interaction with Digital Experience Products.

1.0 Introduction

Digital experience products are a special class of intangible (non-physical) goods and services whose value is derived from consuming them (for their own enjoyment or as part of a decision-making process), or using them in the production of other goods and services (whether those goods and/ or services are also digital experience products or

¹ Our thanks to Dr. Hameed Al-Qaheri (Kuwait University), Dr. John Ferrie (Heriot-Watt University), and an anonymous UKAIS reviewer who provided valuable feedback on earlier drafts of this paper.

not). Digital experience products include (but are not limited to) the following: music, news, financial instruments, weather forecasts, census reports and databases, performances, photographs, search engines, virtual communities, product designs, blue prints, algorithms, instructions, distance education, sports scores, encyclopedias and journals, books, movies, software, directions, and even games.

Focusing on the music industry¹, we site the following statistics that show the dramatic increase in sales based on digital media:

- “Global digital music sales have almost doubled to around \$2bn (1bn pounds) in 2006... which represents 10% of sales” (Digital Music Sees Sales Double, 2007).
- “The digital music business internationally saw a sixth year of expansion in 2008, by an estimated 25 percent to UD\$3.7 billion in trade value. Digital platforms now account for around 20 percent of recorded music sales, up from 15 percent in 2007” (IFPI Publishes Digital Music Report 2009, 2009).
- “The recorded music industry generates a greater portion of its revenues through digital sales than the film, magazine and newspaper industries combined. [Reviewing the digital share of revenues by industry, we have the following percentages:] Games 35%, Recorded music 20%, Newspapers 4%. Films 4%, [and] Magazines 1%” (IFPI Publishes Digital Music Report 2009: Key Statistics, 2009).
- “The UK saw the biggest increase in digital sales in the first half of 2008 among the top markets, with sales up 45 percent” (IFPI Publishes Digital Music Report 2009: Key Statistics, 2009).
- “According to The NPD Group, ... digital music sales are making up an ever-greater share of U.S. music sales. CDs comprised 65 percent of all music sold in the first half of 2009 compared to paid digital downloads, which comprised 35 percent of music sales. By comparison, paid digital music downloads comprised just 20 percent of sales in 2007—growing to 30 percent of the music market last year” (Digital Music Increases Share of Overall Music Sales Volume in the U.S., 2009).

Some literature has referred to these goods and services as information goods, because the focus is on the information the good or service contains (e.g., Wang and Zhang 2007). We steer clear of the “information” label for two reasons. First, we do not wish to cloud the scope of the paper with definitions of what information is and distinctions between information, data, knowledge, and the information creation process. Second, we do not wish to debate (for example) whether musical recordings qualify as information, as some researchers have stated a recording is information whereas a live performance is a service (see Lovelock 1991 in Freiden, Goldsmith, Takacs, and Hofacker 1998). Due (1995) solidified these sentiments stating “[a] few years ago nobody would have said that pictures, and music, and text in a book, and even money are really the same thing. Nowadays, we look at them all as represented by the same kind of entity, in that they are all processed by the same kind of machine” (p.76). Aside from the “information” label, literature on information goods is confusing as some say information is anything that can be digitized (Shapiro and Varian 1999), while others say that information goods are experience goods (e.g., Clemons 2003; Kim, Lee, and Kim 2009). As we will show in this paper, the label “good” is also misused and should be replaced with the label “product.”

To date, there is no single paper that addresses the issue of digital experience products. Many papers point to vague concepts of digital experience products, but none have tackled the issue head-on. Furthermore, most of the literature written on experience goods has been model based. Our paper will synthesize previous works and address theoretical aspects of this class of products. It is important to articulate the special features of digital experience products and how those features influence human interaction with a class of products, which is clearly distinct from the class of traditionally physical products. In understanding digital experience products researchers can help practitioners develop better strategies for marketing and procuring these products.

Our paper is organized as follows: the next section articulates the concept of a product and details the characteristics from that label distinguishing services from goods. Section 3 addresses the digital aspect of the goods and services and describes implications that

follow from the product being in digital form. Section 4 explains why such products are labeled as experience products and lays out how that characteristic influences the class of products. After explaining labels of product, digital, and experience, Section 5 puts forth strategies for acquiring digital experience products. Finally, Section 6 summarizes the work and offers directions for future research in this area.

2.0 Products

Products are items or conditions resulting from a producer's actions, which can be offered to consumers to fulfill their wants and/ or needs. The International Federation of Library Associations (IFLA) defines products as a "bundle of attributes, features, functions, benefits and uses capable of exchange, usually in tangible or intangible forms." Products can be theoretically separated into goods and services.

According to Shapiro (1973) a good "in economics [is] any tangible thing which people consider useful and which is a benefit within the meaning of that concept in our society" (p.73). A good is an item or an object that can be described by a noun (Rathmell 1966). Goods are mostly tangible in form (Rathmell 1966; IFLA), where utility lies in the "physical characteristics of the product" (Rathmell 1966, p. 33). When a good is purchased, there is a transfer of ownership of an asset (Williston 1906; Rathmell 1966)ⁱⁱ.

According to Shapiro (1973) a service is "work performed by individuals or firms for others where no goods or commodities are transferred; [or] privileges extended to customers of a firm beyond the merchandise itself" (p. 151). A service is an item or an act that can be described by "a verb ... a deed, a performance, or effort" (Rathmell 1966, p. 33). Services are mostly intangible (Regan 1963; Rathmell 1966; IFLA), where utility lies in the "nature of the action performed" (Rathmell 1966). When a service is purchased, there is no ownership transferredⁱⁱⁱ (Williston 1906), but the buyer "incurs and expense" (Rathmell 1966, p. 33)^{iv} for the work and labor going into creating non-existing commodities^v or tailor-made objects (Williston 1906).

Despite theoretical distinctions made between goods and services, in practice those lines are blurry and it is often difficult to tease out pure goods or pure services. As Rathmell (1966) reports:

most goods, whether consumer or industrial, require supporting services in order to be useful; most services require supporting goods in order to be useful. ... Economic products lie along a goods-service continuum ... Most goods are a complex of goods and facilitating services; most services are a complex of services and facilitating goods. This mixed nature of economic products is well illustrated by the leasing transaction. If a product is purchased, it is a good; but if it is rented or leased, the rentee or lessee acquires a service (p. 33-4).

Now that we have defined products and explained the distinction between goods and services, we move on to explain the digital label.

3.0 Digital

Digital is defined as “composed of a stream of bits.” That is consecutive zeros and ones that are machine readable (e.g., using a computer, CD player, DVD player and the like). Digital refers to the lack of a physical/ tangible form, or the ability to be separated from its storage medium (Thong and Yap 1998) as where the software on a CD can be uploaded to a computer and as such the CD (i.e., the storage medium) is no longer necessary to execute that software. As such, the value of a digital product lies within the interpretation or activation of machine readable bits (listening to the song, or using the editing software), not within the physical medium on which it resides (Bakos, Brynjolfsson, and Lichtman 1999; Bhargava and Choudhary 2001; Chen and Seshardi 2007).

The producer of the master copy (first copy) of a digital product usually bears the costs of development that are characterized as high fixed sunk costs (Varian 1995; Varian 1997; Varian 1998; Shapiro and Varian 1999; Huang, Wang, Yu, and Chiu. 2004; Chen and

Seshardi 2007; Linde 2009). This means it is expensive to create the master copy of a digital product. In a film this would be the advance costs paid for actors, sets, costumes, editing, advertising and so on, and these costs are not recoverable to the producer if the digital product (the film) proves unprofitable. However, after the master copy of the digital product has been produced, all future copies have negligible costs of reproduction (Varian 1998; Fishburn and Odlyzko 1999; Bakos and Brynjolfsson 2000; Gazzale and MacKie-Mason 2001; Gundepudi, Rudi, and Seidmann 2001; Huang, Wang, Yu, and Chiu. 2004; Chellappa and Shivendu 2005; Geng, Stinchcombe, and Whinston 2005; Chen and Seshardi 2007; Linde 2009). That is, copies of the film are stamped out in seconds on DVD media that cost next to nothing, or the film is uploaded to the Internet where it can be viewed on a pay-per-view basis or passed around “for free.” The primary driver for negligible costs of reproduction is that digital products are easily, cheaply, and accurately duplicatable (Bakos, Brynjolfsson, and Lichtman 1999).

Pre-digital copying technologies were imperfect (Bakos, Brynjolfsson, and Lichtman 1999) and sometimes degraded the product. For example a photocopied book might not be as legible as the book itself or a videotaped copy of a film might not be as clear as the cinematic version. However, due to technological advances (particularly the Internet) duplication and widespread distribution and adoption has become easy (Bakos and Brynjolfsson 2000; Jing 2000; Gundepudi, Rudi, and Seidmann 2001; Linde 2009).

The Internet has driven reproduction costs of digital products even lower by doing away with the need for a storage medium^{vi} and physical delivery channels^{vii} (e.g., Bakos and Brynjolfsson 2000). Furthermore, the Internet can influence decision choices by lowering search costs^{viii} (Bakos and Brynjolfsson 2000), offering free products that affect rapid adoption (Jing 2000; Wang and Zhang 2007; Linde 2009), and drawing attention to digital products’ network externalities (Bakos and Brynjolfsson 2000; Linde 2009). Network externalities refer to the effect where a product is more valuable to a single consumer the greater the number of consumers that use it (Shapiro and Varian 1999; Bakos and Brynjolfsson 2000; Linde 2009). For example, if only one person has email capabilities then that product (email) is not very valuable because there is no one to

contact! However, the more people that acquire the email product, the more valuable the product becomes (more people to contact and conduct exchanges with). Wide distribution feeds into rapid adoption and network externalities.

A different implication of being a digital product is having non-rival and non-excludable properties (Varian 1998; Freiden, Goldsmith, Takacs, and Hofacker 1998). Varian (1998) best distinguishes these properties as follows:

Nonrival means that one person's consumption doesn't diminish the amount available to other people, while nonexcludable means that one person cannot exclude another person from consuming the good in question. ... Nonrivalness is a property of the good itself ...

Excludability is a bit different since it depends, at least in part, on the legal regime ... [it is] a social choice (Varian 1998, p. 6-7).

Non-rival and non-excludable can also mean that there is no perceived loss in value to the producer (or the person that owns reproduction rights) when unauthorized copies are made and distributed. In the case of physical products, if a physical product is taken and distributed, the producer perceives a loss (there are not as many cars as produced) and so the producer takes steps to recover the loss. In the case of digital products, however, there is no perceived loss if someone makes an unauthorized copy of a book and reads it.

The non-rival and non-excludable properties can lead to unauthorized duplication, and free riding^{ix} (e.g., Fulk, Heino, Flanagan, Monge, and Bar. 2004). Furthermore, copies of digital products are indistinguishable from originals (e.g., Maass, Behrendt, and Gangemi 2007). Consumers who focus on the non-rival and non-excludable properties of digital goods along with the negligible reproduction costs and ease of duplication, can legitimize their ideas of unauthorized duplication of digital products (see Zamoon and Curley 2007 and 2008).

There are a number of issues that stem from human involvement with digital products. Following are a few of those issues:

- **Interoperability:** this means how re-usable a digital product (or part of a digital product) is in the making of other digital products. For example, a particular scene in a film, or chorus of music can be reused several times in several films (or the same film) once it has been recorded. Also, instructions that are part of a computer program can be used several times in the same program or copied to another program once working properly. Some digital products are interoperable. That is, can be moved to and used in several digital products. Other digital products can lack interoperability because components of the digital product “often stem from different sources (i.e., applications) which have widely differing underlying assumptions about describing the content, its usage and what they regards as meta-data” (Maass, Behrendt, Gangemi 2007, p. 19)”. The lack of interoperability in digital products that rely on factual data can be tied to what Mason (1986) labeled as the accuracy issue of the information age. Accuracy refers to the authenticity and error-free nature of the data or information on which products are based. For example, in a decision-support software, the assumptions underlying the decision arrived at by the software are key. If there was disagreement about those assumptions, the decision-support software would have low interoperability. That is, producers would not be able to reuse that portion of the computer code in other digital products that operated under different assumptions.
- **Ownership:** this refers to the fact that consumers may not have a clear idea of who owns digital products, and what constitutes fair prices for digital products (see Mason 1986). This is particularly important for digital products because the negligible reproduction costs lead to virtually limitless sales when compared to non-digital products which are limited by both demand and supply constraints (Gundepudi, Rudi, and Seidmann 2001). Furthermore, because of non-rival and non-excludable properties, some authors find that violation of ownership rights can never be completely eliminated (Shapiro and Varian 1999).
- **Privacy:** this refers to information about consumers use of digital products and the right to reveal or keep that information to one’s self (e.g., Mason 1986; Good, Han, Miles, Molnar, Mulligan, Quilter, Urban, and Wagner 2004). For example

consider an agency's use of radio frequency identification (RFID) to tag information that consumers purchase or even browses over the Internet "without [the agency] identifying themselves or the subject of their inquiry." (Good, Han, Miles, Molnar, Mulligan, Quilter, Urban, and Wagner 2004, p. 41).

- Accessibility: this refers to what digital products consumers and/ or organizations are allowed to experience (Mason 1986).

Now that we have explored what it means for a product to be digital, we continue to define what it means for a product to be an experience product and what impacts that feature has on the product and human interactions with that product.

4.0 Experience

Experience products are those goods and/ or services that must be sensed by seeing, hearing, smelling, using, or other unquantifiable operation, before^x an individual can ascertain their quality or value to him/ herself (Nelson 1970; Varian 1998; Bhargava and Sundaresan 2003; Wang and Zhang 2007; Linde 2009), where elements of the product are closely coupled with the consumer's perceptions of it (Chellappa and Shivendu 2005) or how well it fulfills its purpose (in use like a financial instrument or in entertainment like a performance). As such, experience has to do with a perception of how an individual feels about the product and how s/he values it.

Experience products are contrasted with non-experience products also known as search products (e.g., Nelson 1970; Franke, Huhmann, and Mothersbaugh 2004). The distinction between experience products and search products is made based upon when the consumer "can evaluate their critical characteristics" (Franke, Huhmann, and Mothersbaugh 2004, p. 20), where search products' critical characteristics can be evaluated prior to purchase whereas experience products' critical characteristics are only fully revealed after purchase^{xi}. For example, when shopping for a laptop computer the weight, dimensions of the screen, color, processing speed and memory capacity are all features that can be evaluated prior to purchasing the laptop. As such, we could say the laptop is a search

product. However, how satisfied the consumer is with the laptop as s/he runs editing software or how satisfied the consumer is with after purchase care and customer service are experience products. Hence, we could say the laptop is an experience product. It is interesting that most technologies nowadays comprise a mix of characteristics, some search and other experience.

A major part of the experience process is how the class of products is valued. The following examples illustrate this point. The value a consumer may have for a photograph can be derived from the quality of the image and the enjoyment from viewing the image, or the feelings/ memories of past enjoyment the photograph invokes. The value a consumer may have for decision-support software can be derived from the decision to invest in a certain company's stock. Finally, the value a consumer may have for a sound recording and synthesizing software can be derived from the use of that software to produce sound clips for an online learning community.

Digital experience products exhibit four characteristics that differ from traditionally physical (search) products. **First**, the more of a physical product an individual has the more value that individual has accumulated. For example, a person having one new car has less value than a person having ten new cars. However, for digital experience products, the more an individual has does not equate into more accumulated value, in fact it may even be less (e.g., Geng, Stinchcombe, and Whinston 2005). For example, when a person is planning a trip to the beach, s/he would want to check the weather forecast to be more certain of a pleasant sunny calm sea day. The first two (for example) weather forecast websites viewed by a person have value, but after the seventh or so weather forecast website all the rest of the weather forecast websites have less value. This can be explained by the cognitive costs associated with the consumption experience. As Hui, Yoo, and Tam explain "consumers take cognitive costs as part of the consumption experience; once a selection is made (i.e., when cognitive cost should theoretically become a sunk cost), utility from the consumption of that selection continues to be affected by cognitive cost" (Hui, Yoo, and Tam 2007, p. 179). **Second**, the value of an experience product can have different valuations at different times (Bakos and

Brynjolfsson 1999). For example, a member of a virtual community may value that experience and being part of that community more in difficult times of illness or despair than in good times. **Third**, once a consumer has experienced the product, it may lose all value. For example a consumer can value a DVD of an unviewed movie. Once the movie has been viewed, that same consumer can perceive that the DVD sitting with other countless (already viewed) DVDs has no value or even negative value because it is creating clutter! **Fourth**, valuation of an experience product can be related to how many other people have access to the same experience product. That is called network externalities; which we have already discussed in the previous section

5.0 Strategies for Acquiring Digital Experience Products

Having explained the labels of: digital, experience, and products, it is time to think of how putting together these labels affects the class of items we are referring to. We can represent these labels graphically by thinking of the entire set of products (containing everything from sand to computers and pie). All products can be goods or services or a mix of both a subset of those products would be experience products (containing everything from a Ferris wheel ride to the scent of a perfume and a concert), a subset of experience products would be digital experience products (see Figure 1). Information goods and services are peppered through the figure. That is, information products have no single boundary in figure 1. An encyclopedia entry (for example) is a service (because it is leased, not strictly sold) and therefore belongs on the service side of the graph. If that entry is in a physical book in a library it is in the experience products box on the service side, but not in the digital experience products box on the service side (unless the entry is accessed online or using a CD). Having a computer system including a prototype machine designed specifically for your unique business needs to be sold to your business and no others would be an information product. The unique machinery that was created for your business alone would be placed in the goods side of figure 1 in the experience box, whereas the software that runs on the machine would be in the digital experience product box most likely in the overlap area between goods and services.

Products

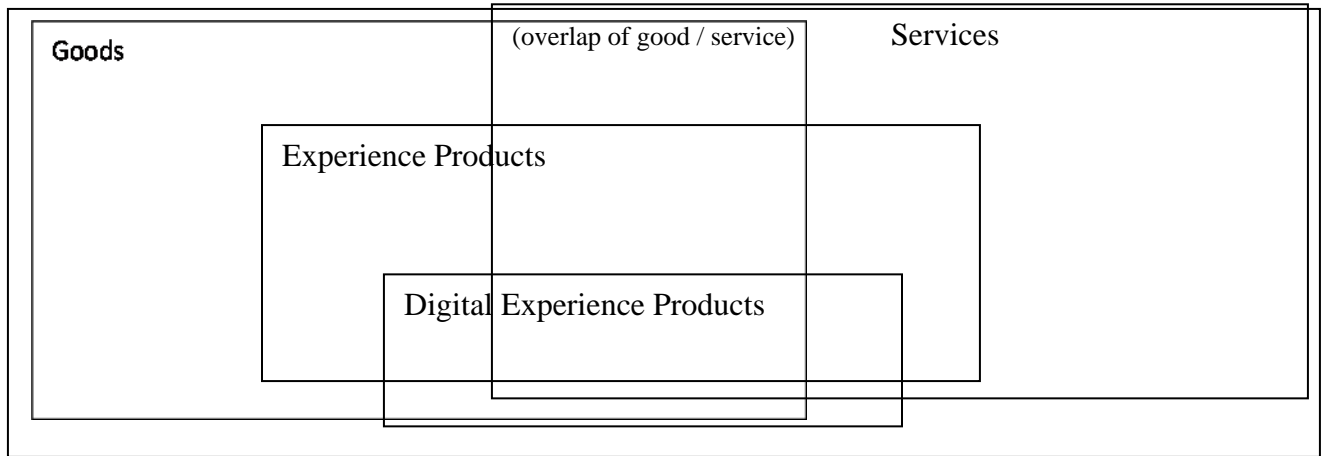


Figure 1. Relationship between Products (goods and services), Experience Products, and Digital Experience Products

There are a number of emergent strategies that are unique to digital experience products. Until this paper, most of the research done has been applied to information goods. However, since we claim that digital experience products are a larger class than information goods, some of the research on information goods may be applicable to digital experience products. In this section we focus on strategies for acquiring digital experience products. Regardless of the payment strategy it is important to note that most digital experience products are licensed, and not strictly sold^{xii}. To license a digital experience product means to allow the consumer limited usage rights without relinquishing ownership rights. This means, for example, that the consumer can listen, view, or otherwise use the product in private, but is not allowed to resell the product, try to figure out how it works (reverse engineer the product), or allow large numbers of people to enjoy the product (e.g., public showing of an individually bought DVD). This differs from the strategy for traditionally physical (search) products that intuitively favor selling. Even for licensing of digital experience products some producers require payment for the product, while other producers offer non-payment options.

5.1 Payment Strategies

Payment for digital experience products is not a straightforward matter, because of individual valuations of the products in addition to considerations of free-riding which producers must take into account when pricing their offerings. As such, it is difficult to set prices based upon differing consumer valuations or willingness to pay. For digital experience products practitioners have tried to get consumers to reveal their willingness to pay or price discrimination for such products (e.g., see Dedeke 2002; Sundararajan 2004; Hui, Yoo, and Tam 2007; Kim, Lee, and Kim 2009; Linde 2009). The following strategies have been useful in price discrimination and marketing segmentation: bundling, versioning and renting.

5.1.1 *Bundling*

Bundling means selling a group of products (goods and/ or services) as a single unit as opposed to selling each product individually. For example, a singer does not sell each song as a single, but bundles a group of songs into an album. Also, computer editing software like Microsoft Word is sold in a suite along with Microsoft Power Point, Visio, and Excel. As a final example, consumers buy a complete series (bundle) of their favorite television shows like Friends or NCIS, not episode by episode (single product).

A point that distinguishes digital experience products from physical (search) products is the ability to bundle. Whereas physical (search) products are most often coupled with a “distinct price,” digital experience products are sold in groups where each group of products has a price (Bakos and Brynjolfsson 1999). Furthermore, because of non-negligible reproduction costs, “the potential impact of large-scale aggregation [for physical / search products] is limited” (Bakos and Brynjolfsson 2000, p.63).

There are at least six advantages to bundling. **First**, a producer using a bundling strategy may be able to “extract more value” when products are bundled (Bakos and Brynjolfsson 1999). **Second**, using a bundling strategy, a producer may be able to “enter a new market and dislodge an incumbent who does not bundle” by adding a single product to an

existing bundle (Bakos and Brynjolfsson 2000, p. 63). **Third**, a producer using a bundling strategy can outbid smaller producers when competing for digital products and producers can make it difficult for non-bundling producers to compete for consumers (Bakos and Brynjolfsson 2000). **Forth**, producers can capitalize on the interoperability of some individual digital products re-bundling them in several ways to create several distinct bundles (Gazzale and MacKie-Mason 2001). **Fifth**, producers of single digital products may “have lower incentives to innovate” (Bakos and Brynjolfsson 2000, p. 63). Finally, **sixth**, bundling can have favorable impacts on social welfare where it may “substantially reduce the deadweight loss from monopoly” (Bakos and Brynjolfsson 1997, p. 18).

5.1.2 *Versioning*

Versioning means producing different qualities of the same digital experience product to be sold at different prices and/ or times. For example, a book can be released in hardcover or soft cover. A film can be released in the cinema then on DVD. Printers can be fast and quiet or slower and noisy. Computing software can limit the user to a number of cells (like in student editions of MatLab) or allow limitless computations (professional editions of software). Websites can stream content with constant advertising interruptions, or without.

The reason for producing different qualities of the same product is to segment consumers based upon their willingness to pay for different qualities. Methods of versioning include elements of degradation. Degradation can include disabling some features, speed, timing of release/ delay, nagwear (i.e., harassing advertising), clarity, sensitivity, compatibility (see Shapiro and Varian 1999; Dedeker 2002; Chen and Seshardi 2007; Linde 2009).

5.1.3 *Renting*

Renting means allowing consumers to temporarily use the digital experience product this can be for free, or based on a negligible price. For example using Internet services within

an airport, using a hotel's copy of Microsoft Office while in a hotel room, or renting a movie. This concept of renting is certainly not new. As Varian (2000) put it "books, journals, computer software, and video tapes are often rented ... and there are several social institutions such as libraries, video stores, and used book stores that facilitate" such exchanges (p. 473).

5.2 Non-Payment Strategies

The focus on non-rival and non-excludable properties of digital experience products, inability to distinguish originals from copies, negligible reproduction costs, consumers' views on unauthorized duplication, and the producers views on accessibility rights can have an impact on a producers choice of pricing strategy, and can even lead to the producers offering their products using non-payment methods as freeware or open source ware, which is often done to bolster network externalities. Under non-payment strategies we examine freely offering products and sharing.

5.2.1 Free

When a producer does not accept or expect monetary compensation for digital experience products they are offered to consumers for free. Some music artists offer their albums online for consumers to hear and download free of costs in the hopes of building a following for their next album (which will require payment) or to boost sales of their memorabilia or sales of their concert tickets. Software companies may be inclined to offer new products for free because, as Wang and Zhang (2007) describe, "consumers face uncertainty about a product's value if they have not used it before" (p.225) and producers can ease this uncertainty by allowing consumers to personally experience the product in a safe environment (without risking a loss in money). Some companies even capitalize on consumer feedback on their software by allowing consumers to experiment with it, thereby revealing faults and areas for possible improvements. Many products are offered on the Internet freely which can lead to "rapid adoption of these new technologies" (Jing 2000, p. 1), thereby amplifying network externalities. Furthermore,

free offerings of a number of products can impact a producer's profits. Parker and Van Alstyne (2000) find that "free strategic complements can raise a firm's own profits while free strategic substitutes can lower profits for competitors" (p.107).

5.2.2 *Sharing*

Sharing means the legitimate purchaser of a digital experience product may allow non-purchasing consumers to use his/her copy for a limited time. It may be counter intuitive that producers would permit such behavior. Interestingly, as Bakos, Brynjolfsson, and Litchman (1999) show, sharing can be profitable:

under certain circumstances sharing will markedly *increase* profit even if sharing is inefficient in the sense that it is more expensive for consumers to distribute the good via sharing that it would be for the producer to simply produce additional units. Conversely, we find that sharing can markedly *decrease* profit even where sharing reduces net distribution costs. (p. 117)

6.0 **Summary and Directions for Future Research**

In this paper we have reviewed articles on digital experience products and have synthesized the following four central points. **First**, a product is an item or condition resulting from a producer's actions and can be classified into goods (mostly tangible) and services (mostly intangible). **Second**, digital products are products that are composed of a stream of bits. Being in digital form affects: production and reproduction costs, lack of degradation when copies are made, the need for storage medium and physical delivery channel (makes them obsolete in the presence of the Internet), the importance of network externality effects, as well as non-rival and non-excludable properties. Furthermore, being digital has impacts on interoperability, ownership, privacy, and accessibility. **Third**, experience products are those products that must be sensed before a consumer can ascertain quality or value as opposed to physical (search) products whose critical characteristics can be ascertained before purchase. Being an experience product affects

how products are valued. **Forth**, strategies for acquiring digital experience products are distinguished into payment strategies (bundling, versioning, renting), and non-payment strategies (free, sharing).

Future extensions of this work include investigations of the supply chain of digital experience products and distinguishing features that would separate those supply chains from the supply chains of traditionally physical (search) products. A supply chain is the set of actors and activities that it takes to create a product from acquiring raw materials to creating the product and until the product reaches its final consumer. The supply chain also comprises the return flow of the product if unused by the consumer or the reuse or recycling of materials when the consumer disposes of the product. Understanding the supply chain of digital experience products can help in improving the production process of digital experience products (efficiency gains).

Another possibility for expanding this work lies in the unique features of digital experience products compared to those of traditionally physical products. Fulk, Heino, Flanagan, Monge, and Bar (2004) provide a good starting point for such a comparison as they focus on information goods. In their paper, the researchers stress ownership rights are unique for information goods because unlike transferring ownership of physical goods the transferor continues to hold the digital item privately. That means there is no decline in value for contributed goods (retention of original). Also, if the digital good has information content, there is an “invisibility aspect” where it is not easy to evaluate the information store; and equally as problematic is not knowing what other information possible contributors possess that is not being shared. Furthermore, the value of information is unstable across individuals as well as across time. The level of progress on an information good is not directly quantifiable when compared to progress on a tangible physical good. Information goods are not easily converted to the commonly used money metric (i.e., not fungible) (see Fulk, Heino, Flanagan, Monge, and Bar. 2004). This could aid in understanding why digital experience products may be treated differently than traditionally physical products. Furthermore, results may have implications for digital experience product producers in terms of better pricing and protection strategies. This

would continue an existing stream of research which focuses on how unique features of information goods influence dimensions of moral intensity (judgment of how ethically charged a situation is in determining the need to activate ethical decision-making with principles instead of preference or cost/ benefit) (Zamoon and Curley 2007).

Another stream of research could order digital experience products along a continuum (for example the good/ service continuum) or find some means to classify them into groups. To date, only two works have attempted this with a narrow scope of information goods alone (see Clemons 2003; Maass, Behrendt, Gangemi 2007). Clemons (2003) stated that information goods could be arranged on an infotainment continuum where pure entertainment would be exemplified in music, and strict information exemplified in news. Maas, Behrendt and Gangemi (2007) distinguish information that is referential (i.e., user-perceivable like user manuals) from information that is user-non-perceivable worlds (like poems) and static versus dynamic information based upon the availability of a mechanism to modify content.

References

- Bakos, Y. and Brynjolfsson, E. (1997) *Aggregating and disaggregating information goods: implications for bundling, site leasing, and subscriptions*, In Proceedings of Internet Publishing and Beyond: The economics of digital information and intellectual property, Cambridge, MA, USA. Kennedy School of Government. Available at www.stern.nyu.edu/~bakos
- Bakos, Y. and Brynjolfsson, E. (1999) Bundling Information Goods: Pricing, Profits, and Efficiency, *Management Science*, **45** (12). 1613-1630.
- Bakos, Y. and Brynjolfsson, E. (2000) Bundling and Competition on the Internet, *Marketing Science*, **19** (1). 63-82.
- Bakos, Y., Brynjolfsson, E. and Lichtman, D. (1999) Shared Information Goods, *Journal of Law Economics*, **XLII** (April). 117-155.
- Bhargava, H. and Choudhary, V. (2001) Information Goods and Vertical Differentiation, *Journal of Management Information Systems*, **18** (2). 85-102.
- Bhargava, H. K. and Sundaresan, S. (2003) Contingency Pricing for Information Goods and Services Under Industrywide Performance Standard, *Journal of Management Information Systems*, **20** (2). 113-136.
- Chellappa, R. K. and Shivendu, S. (2005) Managing Piracy: Pricing and Sampling Strategies for Digital Experience Goods in Vertically Segmented Markets, *Information Systems Research*, **16** (4). 400-417.
- Chen, Y-J. and Seshardi, S. (2007) Product Development and Pricing Strategy for Information Goods Under Heterogeneous Outside Opportunities, *Information Systems Research*, **18** (2). 150-172.
- Clemons, E. K. (2003) The Decoupling of Value Creation from Revenue: a Strategic Analysis of the Markets for Pure Information Goods, *Information Technology and Management*, **4**. 259-287.
- Committee on Definitions—American Marketing Association (1948) Report of the Definitions Committee, *Journal of Marketing*, **13**. 202 - 217.
- Dedeke, A. (2002) Self-Selection Strategies for Information Goods, *First Monday*, **7** (3). - Available at: http://firstmonday.org/issues/issue7_3/dedeke/index.html
- Digital Music Increases Share of Overall Music Sales Volume in the U.S. available at: http://www.npd.com/press/releases/press_090818.html

Digital Music Sees Sales Double. Available at:
<http://news.bbc.co.uk/1/hi/entertainment/6270855.stm>

Due, R. T. (1995) The Knowledge Economy, *Information Systems Management*, **12** (3). 76-78.

Dumlupinar, B. Market Commoditization of Products and Services, *Review of Social, Economic and Business Studies*, **9**. 101-114. Available at
<http://fbe.emu.edu.tr/journal/doc/9-10/06.pdf>

Franke, G. R., Huhmann, B. A., and Mothersbaugh, D. L. (2004) Information Content and Consumer Readership of Print ads: a Comparison of Search and Experience Products, *Journal of the Academy of Marketing Science*, **32** (1). 20-31.

Freiden, J., Goldsmith, R., Takacs, S. and Hofacker, C. (1998) Information as Product, Not Goods, Not Services, *Marketing Intelligence and Planning*, **16** (3). 210-220.

Fishburn, P. C. and Odlyzko, A. M. (1999) Competitive Pricing of Information Goods: Subscription Pricing Versus Pay-Per-Use, *Information Economic Theory*, **13**. 447-470.

Fulk, J., Heino, R., Flanagan, A.J., Monge, P.R. and Bar, F. (2004) A Test of the Individual Action Model for Organizational Information Commons, *Organization Science*, **15** (5). 569-585

Gazzale, R. S. and MacKie-Mason, J. (2001) *Endogenous Differentiation of information goods under uncertainty*, In Proceedings of the 3rd ACM Conference on Electronic Commerce, pp. 75-84.

Geng, X., Stinchcombe, M. B. and Whinston, A. B. (2005) Bundling Information Goods of Decreasing Value, *Management Science*, **51** (4). 662-667.

Good, N., Han, J., Miles, E., Molnar, D., Mulligan, D., Quilter, L., Urban, J.M., and Wagner, D. (2004) *Radio frequency id and privacy with information goods*, In Proceedings of the 2004 ACM Workshop on Privacy in the Electronic Society, pp. 41-42.

Gundepudi, P., Rudi, N. and Seidmann, A. (2001) Forward Versus Spot Buying of Information Goods, *Journal of Management Information Systems*, **18** (2). 107-131.

Huang, M-H., Wang, J-C., Yu, S. and Chiu, C-C. (2004) Value-Added ERP Information into Information Goods: an Economic Analysis, *Industrial Management and Data Systems*, **104** (8). 689-697.

Hui, W., Yoo, B. and Tam, K. Y. (2007) The Optimal Number of Versions: Why Does Goldilocks Pricing Work for Information Goods, *Journal of Management Information Systems*, **24** (3). 167-191.

International Federation of Library Associations (IFLA): Section on management and marketing, Glossary of marketing definitions available at <http://archive.ifla.org/VII/s34/pubs/glossary.htm>

IFPI Publishes Digital Music Report 2009. Available at: http://www.ifpi.org/content/section_resources/dmr2009.html

IFPI Publishes Digital Music Report 2009: Key Statistics. Available at: <http://www.ifpi.org/content/library/DMR2009-key-statistics.pdf>

Jing, B. (2000) *Versioning Information Goods with Network Externalities*, In Proceedings of the 21st International Conference on Information Systems, pp. 1-12.

Kim, E., Lee, B. and Kim, J-C. (2009) Versioning Information Goods of Multi-Channel Publishers in Two-Sided Markets, *Online Information Review*, **33** (4). 785-804.

Linde, F. (2009) Pricing Information Goods, *Journal of Product and Brand Management*, **18** (5). 379-384.

Mason, R. O. (1986) Four Ethical Issues of the Information Age, *Management Information Systems Quarterly*, **10**(1). 5-12.

Matear, S., Gray, B., Garrett, T. and Deans, K. (2000) Moderating Effects of Service Characteristics on the Sources of Competitive Advantage - Positional Advantage Relationship, *ANZMAC Visionary Marketing for the 21st Century: Facing the Challenge*. Available at: <http://smib.vuw.ac.nz:8081/www/ANZMAC2000/CDsite/papers/m/Matear1.PDF>

Maass, W., Behrendt, W. and Gangemi, A. (2007) Trading Digital Information Goods Based on Semantic Technologies, *Journal of Theoretical and Applied Electronic Commerce Research*, **2** (3). 18-35.

Nelson, P. (1970) Information and Consumer Behavior, *Journal of Political Economy*, **78** (March/April). 311-329.

Parker, G. G., and Van Alstyne, M. W. (2000) *InterNetwork Externalities and Free Information Goods*, In Proceedings of the 2nd ACM Conference on Electronic Commerce, pp. 107-116.

Rathmell, J. (1966) What is Meant by Services? *Journal of Marketing*, **30** (October). 33-36.

Regan, W. J. (1963) The Service Revolution, *Journal of Marketing*, **27** (July). 57-62.

Sarkar, S. (2007) *Innovation, Market Archtypes and Outcome*. Physica-Verlag Heidelberg: A Springer Company. New York, NY.

Shapiro, I. J. (1973) *Marketing Terms: Definitions, Explanations, and/ or Aspects*. 3rd edition. S-M-C Publishing Company. USA.

Shapiro, C. and Varian, H. (1999) *Information Rules: a Strategic Guide to the Network Economy*. Harvard Business School Press. Boston, MA.

Stigler, G. J. (1961) The Economics of Information, *Journal of Political Economy*, **69** (June). 213-225.

Sundararajan, A. (2004) Nonlinear Pricing of Information Goods, *Management Science*, **50** (12). 1660-1673.

Thong, J. Y. L. and Yap, C. S. (1998) Testing an Ethical Decision-Making Theory: the Case of Softlifting, *Journal of Management Information Systems*, **15**. 213-237.

Varian, H. R. (1995) *Pricing Information Good*, In Proceedings of Scholarship New Information Environment Symposium. Cambridge: Harvard Law School. Available at www.sims.berkeley.edu/~hal

Varian, H. R. (1997) Versioning Information Goods. Working Paper, School of Information Management and Systems, University of California at Berkeley, March 1997. Available at www.sims.berkeley.edu/~hal

Varian, H. (1998) Markets for Information Goods: Draft, University of California, Berkeley, CA.

Varian, H. (2000) Buying, Renting, and Sharing Information Goods. *Journal of Industrial Economics*, **48** (4). 473-488. available at www.sims.berkeley.edu/~hal

Wang, C. and Zhang, X. (2007) Sampling of Information Goods, *ICEC August 2007 Minneapolis, Minnesota*, 225-233.

Williston, S. (1906) The Right of a Seller of Goods to Recover the Price, *Harvard Law Review*, **20**. 363-381.

Zamoon, S. and Curley, S. P. (2008) Ripped from the Headlines: What Can the Popular Press Teach us about Software Piracy? *Journal of Business Ethics*, **83**. 515-533.

Zamoon, S. and Curley, S. P. (2007) IT Influences on Moral Intensity in Ethical Decision-Making. Working Paper, Carlson School of Management, University of Minnesota, March 2009. Available at <http://www.misrc.umn.edu/workingpapers/fullpapers/2009/ZamoonCurley2009-03.pdf>

ⁱ Merely because it's the easiest to find statistics on.

ⁱⁱ For further discussion of types of goods see Committee Definitions (1948), Rathmell (1966), Nelson (1970), and Varian (1998).

ⁱⁱⁱ If an object's ownership is transferred it is not the focus of the transaction, i.e., it is not the raw materials' cost that are being paid for, but the work and labor that went into creating the object or conducting the action (Williston 1906).

^{iv} For further discussion of service characteristics see Regan (1963), Rathmell (1966), and Matear, Gray, Garrett and Deans (2000).

^v A commodity is the raw material(s) that maybe refined for use as input to other products, like oil, steel, or rice. A product can be labeled a commodity when different producers' offerings are indistinguishable (not differentiated) from each other, where price becomes the primary decision factor (for further discussion of commodities see Dumlupinar; Sarkar 2007). To understand how technology influences commoditization refer to Foster 1986, as well as Sarkar 2007.

^{vi} Software, games, instructions, and music are examples of digital products that need not be sold on a CD, they can be downloaded directly onto the consumer's computer via an Internet connection.

^{vii} There is no need for a digital producer to concern itself with logistics of how to get their products to the consumer (via plane, rail, boat, etc), because the Internet can instantaneously deliver the digital product directly to the consumer's desktop.

^{viii} Search costs are the costs to the consumer (in time and money) to find what they are looking for. For example if an individual needed a black shirt, s/he would have to incur costs in time and money to drive around to the stores nearby to see if those stores had black shirts and if the stores carried her/ his size and style desired. For further explanation of search costs refer to Stigler (1961), Nelson (1970), and Franke, Huhmann and Mothersbaugh (2004). The Internet has done away with most of the search costs mentioned in the previous example due to ubiquity of computing facilities and websites with search engines.

^{ix} Free riding means to use a product without having paid for it, which may lead producers of digital products to increase the price of the product so as to recover losses. As such, legitimate users are paying for the digital product, while the unauthorized user is getting a "free ride."

^x Digital experience products are particularly susceptible to unauthorized duplication because of their digital nature and consumers' need to consume some of the product to ensure a match to their wants/ needs before purchasing (Chellappa and Shivendu 2005). As Chellappa and Shivendu (2005) succinctly state it "[a] distinguishing characteristic of *digitized* experience goods, in contrast to their physical counterparts, is that vendors cannot let consumers experience their products without fear of it being pirated" (p.401).

^{xi} It is true that potential consumers of experience products could access information to aid in evaluating products prior to purchase such as reviews (be it reviews of so called experts, or lay people). However, for example, reading a review of the music of Daughtry will not "fully reveal" its quality or how a consumer will value it. Also, getting information on an experience product without a firsthand experience will depend on the valuation and trustworthiness of the source.

^{xiii} This according to Williston's (1906) law opinion would suggest that digital experience products lean heavily toward being a service, because no asset is strictly acquired. This is also in agreement with Rathmell's (1966) service definition. We can see how the lines are blurred for consumers who purchase (for example) a DVD of a movie or a CD album. Consumers may perceive the product as a good because they have acquired the DVD or CD, whereas producers perceive the product as a service because the film or album is not strictly sold as the producer has not relinquished the ownership rights, but is merely letting the consumer lease the option to enjoy the recording because the storage medium (DVD or CD) is worthless without what is being stored on it.