Peer to Peer Interactions and Electronic Commerce

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ABSTRACT
This paper examines Peer to Peer interaction (P2P) and electronic commerce (e-commerce). The first part of this paper will define and review the history of P2P and e-commerce as well as the limitations to e-commerce. This paper will analyze journal articles and a dissertation that relates to P2P interactions and e-commerce. This paper will consist of a detailed assessment of the research norms in the area; research used, relevant theoretical areas, and examines journals and literature sources pertaining to the area of research.

P2P DEFINED

In the article *P2P* Brosnan, Maitrat, Colhoun, and MacArdle (2003) defines P2P as a collaboration or direct communication between various computers that are all equals – peers, and where a client or a server does not exist. The authors state that in order for a system to be considered P2P there are seven characteristics that the systems must share:

- The user interfaces must load outside of the web browser
- The user computer can act as the server and the client
- The system must be easy to use and be able to integrate well
- The system must include tools that support users who want to add functionality or create content
- The system is able to connect with other users
- The has to be able to do something new
- The system can support protocols like XML-RPC or soap. These protocols are also known as cross-network.

The idea behind P2P is the ability to have two peer devices that share information and resources with both acting like a mini-server. Neither device is considered to be the client or the server.

HISTORY OF P2P

According to Brosnan et al. (2003) Napster was the software that introduced the public to P2P. Napster was the single most popular P2P application during its time. In 1999 Shawn Fanning, an 18-year-old college student dropped out of college to create the Napster software. Fanning was discouraged with the difficulty it took to locate and exchange digital music files online. Since Fanning was aware that internet users had many music files on their hard drives, he created a software with the instant messaging system of Internet Rely Chat (IRC), the Microsoft Windows and Unix file-sharing functions, and the searching capabilities of various search engines, Fanning created Napster (Fanning's college nickname). During its inception, Napster became the fastest growing online software of all time. Since the birth of Napster, the growth in the number of P2P technology users has grown. Napster was built on a centralized technique which was easy to keep track of, but today's new applications have adopted a decentralized approach which is much harder to track. There is a lot of concern about the lack of central leadership and control of the decentralized approach (Brosnan et al, 2003).

CURRENT USES OF P2P

Brosnan et al. (2003) has stated in the article *P2P* that P2P technology is being embraced by larger organizations who are trying to understand its many potentials. Two of the most notable organizations are Deloitte & Touche, and Intel. Since central databases are no longer necessary when using P2P, it is less expensive and easier to scale. Since 1992 Intel has been using P2P technology, and has avoided the need for larger servers. Traditional Databases are still common today, but as the number of organizations starts increasing, and start following the examples of organizations like Intel, traditional databases could be replaced by P2P technology.

E-COMMERECE DEFINED

According to the article *e-commerce* by Ketel and Nelson (2003) the authors define e-commerce as the buying and selling of services and goods on the internet. The term e-business and e-commerce is often used interchangeably. The term e-tailing is often used for retail selling. E-Commerce can be divided into numerous categories:

- Virtual storefronts (E-Tailing) – Websites that have online catalogs.
- Gathering and using demographic data through online contacts
- Electronic Data Interchange (EDI)
- The use of e-mail and fax as media researching prospects (example customers)
- Buying and selling from business to business
- Securing business transactions

HISTORY OF E-COMMERCE

In the article *History of eCommerce* by Computer eCommerce (2007) states that before e-commerce all commerce was basically done face-to-face or by regular mail. The internet came about in the 1960's as a Department of Defense project. This project was intended to create a non-centralized network designed to survive a nuclear war and which could still function if part of the network was destroyed. In 1992 the World Wide Web consisted of documents and links, indexes were used to search documents. These virtual search contained links to the documents, and the protocol (HTTP) is used to allow a browser program to request keywords in order to search remote servers. It was during the dotcom era that people talked about using the internet to empower shoppers. Many people who struggled with poorly designed sites figured that this idea would never be fulfilled; however, e-commerce is one of the dotcom ideas that is still holding strong today (Computer eCommerce, 2007).

LIMITATIONS OF E-COMMERCE

In the article *Current Technological Impediments to Business-To-Consumer Electronic Commerce* Rose, Khoo, and Straub (1999) states, that there are several problems with electronic communication. One of the issues with e-commerce is that the consumer cannot feel or access the product over the web. E-commerce also lacks the ability for the customer to smell or taste the product.

E-COMMERCE AND P2P – CHANGING HOW BUSINESS DOES E-COMMERCE

In the text Management Information Systems O'Brian and Marakus (2008) states that e-commerce is changing how organizations conduct business internally as well as externally. E-commerce is changing how organizations deal with their customers, suppliers, and other business partners. The ways organizations have applied e-commerce have gone through some major renovations as e-commerce has matured in the business world. O'Brian and Marakus (2008) shows an example of how e-commerce behaves between businesses and customers (B2C) from offering information regarding the corporation at the companies website to offering goods and services at storefronts on the Web via electronic catalogs.

Some of the trends that are taking place using e-commerce applications are B2C e-commerce, this trend is moving from simple storefronts on the Web to interactive marketing that allows the consumer to experience a personalized shopping experience (O'Brian et al, 2008). O'Brian and Marakus (2008) also states that B2C e-commerce is advancing towards a model where customers are able to customize and configure the products they are interested buying.

P2P

O'Brian and Marakus (2008) stated that P2P file sharing software helps users transfer MP3 audio tracks between their PC's and those of other users on the internet. This software creates a P2P network of users on the Internet who electronically trade digital copyrighted music stored on their hard drives. Today music publishers and manufactures are now offering legal and inexpensive ways to receive online music, because of this approach the music industry has reported that illegal downloading of music and videos have decreased (O'Brian et al, 2008).

E-COMMERCE DISSERTATION LOSERS IN E-BUSINESS

O'Leary's dissertation, *Factors Separating Winners and Losers in E-Business*, is a study of factors that are necessary in the context of e-business success or failure. In the dissertation O'Leary (2003) uses a survey approach along with qualitative data that was gathered from interviews. O'Leary (2003) interviewed venture capitalist (VC) as to some of the reasons some E-Business's failed in the 1990's. For the failed companies the majority of the VC's reported that the management teams did not have experience running a business. The management teams consisted of young people who had no business knowledge and poor management skills. The management teams felt as if they could not be defeated and did not see the risk in the venture. O'Leary (2003) stated that one VC described the business owners as having the attitude that they were about to take over the world. The dissertation also states that one of the themes during the era was that the management teams were either experts in technology or experts in business, but rarely did they possess knowledge in both areas.

O'Leary (2003) stated in his dissertation that the management teams did not view profit as being important. Most of the management teams were unfocused, and one management team was known to change the direction of the company on a weekly basis. Money that was bought into the organization was mainly used to furnish large offices, but there were not enough customers to support the business. O'Leary (2003) stated that greed was very rampant in the 1990's. The majority of the VC's commented that before many management teams started their business they had already planned their exit strategy. VC's also required large percentages of the business for funding the venture. The VC's admitted to not requesting a business plan, and if any plan was written the VC's stated that the plans did not consist of a solid foundation. Many of the management teams stated that the reason e-business failed in the 1990's were because they tried to compete on cost rather than customer satisfaction

E-COMMERCE REVIEW WINNERS IN E-BUSINESS

O'Leary (2003) stated that the VC's had very strong opinions as to how an e-business was successful. The management teams were focused and had a good knowledge of the business. The successful management teams were receptive to feedback and their managers were flexible to change. One VC commented that the Chief Executive Officer (CEO) of his venture was the reason behind his company's e-business success. The CEO hired a good management team; he focused on success, and was committed to the success of the organization at all cost.

In the dissertation O'Leary (2003) commented that the successful management team was able to work with the competition and developed strategic partnerships. The successful teams did not focus on the brands or market shares, but rather they focused on profit. The service and the products were of high quality and people were willing to pay for them. Many of the products had quick payback and were easy to bring to the market. The VC's admitted that the websites design and efficiency was one of the biggest reasons people revisited the websites, but the model of the business is what made the e-business successful.

PEER-TO-PEER DISTRIBUTION

In the dissertation *Essays in Peer-to-Peer Content Distribution Networks: Scale, Formation, and pricing* by Li (2005), the author reviews P2P networks as an important avenue to distribute digital products or services. The author examined both the positive and negative aspects of peer-to-peer networks. Li (2005) stated that as of the publication of the dissertation, there were 130 unique P2P applications on the market. The most popular P2P applications is file sharing. P2P's file sharing networks have attracted many users and have gained a lot of press attention. Li (2005) stated that the inception of P2P has threatened the record industry by the illegal exchange of music files and the industry has experienced loss of revenue.

PERFORMANCE OF P2P

Li (2005) reviews the performance of P2P networks, and stated that P2P networks are an efficient way to deliver data since they do not depend upon a central server. There are however drawbacks to P2P networks because of the decentralized structure. First since each peer node can freely modify their data it can be costly to find desired data. Second since P2P users receive data from one another, the availability of the data is reliant upon the number of peer nodes being logged onto; therefore, reliability of the content may be an issue. If a business had a large server, this issue would be diminished. Li (2005) stated that the operational efficiency of the P2P network should be evaluated by using a performance metric to examine the overall scale effect, user's behavior on the network, and the impact of system parameters. This evaluation is used to determine sizing and grouping decisions for the network.

In the dissertation Li (2005) notes that the P2P network is considered more of a social network rather than a traditional computer network because of the bottom-up self-organizing makeup of the P2P network. Peer nodes are able to decide if they want to share their data and also request to forward interconnection based on what is best for them in the absence of a central planner. Li (2005) stated that the efficiency of P2P could be improved by providing social and economic incentives instead of technological mechanisms.

FINDINGS AND CONCLUSION

In conclusion P2P interaction is a collaboration or direct communication between various computers that are all equals – peers, and where a client or a server does not exist. The idea of P2P is being able to have two peer devices that share information and resources with both acting like a mini-server. Neither device is considered to be the client or the server. E-commerce is the buying and selling of services and goods on the internet.

This researcher reviewed two dissertations in the field of e-commerce and P2P networking. The first dissertation *Factors Separating Winners and Losers in E-Business* the author O'Leary (2003) showed how in the 1990's the emergence of the dot com companies was beginning to form. The dot com companies that failed had a number of traits in common; the management teams did not have experience running a company, the management teams consisted of young people who had no business knowledge, poor management skills, and the management teams felt as if they could not be defeated and did not see the risk in the venture.

In the second dissertation *Essays in Peer-to-Peer Content Distribution Networks: Scale, Formation, and pricing* Li (2005) showed the drawbacks to P2P networks due to its decentralized structure. Li (2005) stated that since each peer node could freely modify their data it could be costly to find desired data. Li (2005) also stated that since P2P users receive data from one another, the availability of the data is reliant upon the number of peer nodes being logged onto; therefore, reliability of the content may be an issue. If a business had a large server, this issue would be diminished. The operational efficiency of the P2P network should be evaluated by using a performance metric to examine the overall scale effect, user's behavior on the network, and the impact of system parameters. This evaluation is used to determine sizing and grouping decisions for the network.

This researcher found that both dissertations were necessary in the advancement of her review. O'Leary (2003) research allowed this researcher to see the advancement of e-commerce in the 1990's and what lead to its success and failures. Li (2005) research allowed this researcher to view the importance of P2P networking and the difference between P2P and a traditional networking setup.

AREA OF FURTHER RESEARCH

An area for further research would be to evaluate the percentage of organizations that are utilizing P2P interaction, and their success. Another area of further research for e-commerce would be to evaluate how organizations are making e-commerce more attractive to consumers and the securities that are put in place for the consumer. Another area of further research would be to evaluate where experts visualize P2P interaction and e-commerce advancements in future technology.

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