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# INTERMEDIARIES AS VALUE MODERATORS IN ELECTRONIC MARKETPLACES

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## Abstract

*The growth of E-commerce had suddenly changed the ground-rules for conducting business, linking the consumer directly to the producer. The digitization of content also meant faster and easier transmission of information from one point to another in a network, thus reducing the need for an intermediary. It was assumed that intermediaries would disappear resulting in frictionless commerce. This paper reexamines such claims of disintermediation and whether intermediaries generate friction in transactions. Theoretically, it argues the contrary, suggesting that intermediation is a necessary evil in e-commerce transactions. In order to justify such claims, the paper assumes that e-commerce exhibits network externality and reviews intermediation in the light Transaction Cost Economics and Agency Theory*

*Keywords: Agency Cost, Transaction Cost, Consumer Surplus, Electronic Markets, Intermediation*

## 1 INTRODUCTION

The ability to effectively and efficiently add transactional value is coveted by every firm, market, and economy. Reduction of costs in a market mode of exchange is viewed as the potential antecedent to transactional and economic value-addition. Upon looking at traditional markets, one simple way to reduce such non-value added costs was to eliminate the middlemen or intermediaries that were adding to the costs of transactions between the producer and the consumer, but their presence was imperative for acquisition and distribution of goods and services from the producer to the consumer. According to Whinston et al (1997), an intermediary helps facilitate transactions between buyers and sellers by providing value-added services such as aggregation and distribution of products and product information, quality checks, and warranties. The growth of E-commerce had suddenly changed the ground-rules for conducting business, linking the consumer directly to the producer. The digitization of content also meant faster and easier transmission of information from one point to another in a network, thus reducing the need for an intermediary. It was assumed that, due to an Electronic Brokerage Effect (Malone et al, 1987), disintermediation would occur and that it would reduce friction in transactions.

This paper refutes the claims of disintermediation and that intermediaries generate friction in transactions. On the contrary, it argues that intermediation is not only necessary but that it is a primary lubricant in e-commerce transactions. In order to justify such claims, the paper assumes that e-commerce exhibits network externality (Katz & Shapiro, 1985), and looks at precedent research on the economics of intermediation and reviews it in the light of two relevant economic theories: Transaction Cost Economics, (Williamson, 1975) and Agency Theory (Fama, 1980). The examination will incorporate different e-commerce research dimensions and issues and look at the types of intermediaries present in e-commerce, their relevance and significance, in order to understand how they add economic value in transactions over e-commerce networks.

The influence of personal computing, LAN, and client/server computing has ushered in an era marked by the convergence of content, connectivity, and computing. The past few years have thereafter experienced a sudden surge in the use of digital technology that has been one of the salient factors in the growth of e-commerce. Everyday, as the electronic networks expand its frontiers to every corner of the globe, e-commerce becomes a distinct and sustainable mode of business for the future. As these electronic networks are rapidly reducing the time and space constraints that had once plagued traditional businesses, the new transformation to a digital economy has gained overwhelming popularity, building on promises and prospects (Tapscott, 1995; Kalakota & Whinston, 1997).

One such promise was that of disintermediation, the process of eliminating the intermediaries and middlemen from transactions. The strength of such an argument was based on the notion that the digital economy was to be frictionless; and intermediaries were causes of friction in an otherwise seamless transactional procedure involving the producer and the consumer (Hoffman & Novak, 1995; Tapscott, 1990). The new and proliferating digital economy was to obliterate traditional product, service, and information supply chains and bring about a virtual *perestroika*, marked by a disintermediated and frictionless market. The traditional markets had always relied upon intermediaries and middlemen as the transferors of goods, services and information, therefore increasing transactional distance between the producer and the consumer. The virtual marketplace was to take advantage of the digital economy to reduce the transactional distance between producers and consumers. For the consumers, it would mean greater savings and for the producer, bigger profits and greater and cheaper access to consumer information (Schrage, 1997). There are, however, associated ambiguities.

Using transaction costs theory and agency theory, the objective of this paper is to understand the cause and impact of intermediation in markets and how intermediation adds economic value for consumers. The organization of this study is as follows: The first section begins with identifying the notion of economic value addition for the consumer. The second section looks at the why intermediation exists in traditional and electronic markets. The third section examines the costs associated with intermediated and disintermediated markets. The fourth section introduces an intermediation-disintermediation framework. The fifth section looks at the role of intermediaries in electronic markets and concludes with limitations and cues for future research.

## **2 ECONOMIC VALUE-ADDITION FOR CONSUMERS IN E-COMMERCE**

### **2.1 The Notion of Consumer Surplus**

The aggregate demand curve is a primary representation of a market in microeconomic theory. It is essentially the same for e-commerce- where consumerism (Tapscott, 1995) is the *zeitgeist* of the digital economy. The demand curve assists in understanding the value addition in terms of the consumer's perception of value of a good or service and considering it with the value set by the market in the face of competition. For a said price, consumers demand a said quantity as signified by the demand curve (Fig. 1). Depending on the perceived value, the consumer sets a reservation price (RP)- the maximum amount that one is willing to pay for obtaining the particular value. However, depending on the nature of prevailing competition, the consumer pays the market price (MP), if it is less than that of one's reservation price. While pressure on prices mounts as the competition increases along with the market size, so do transaction costs. The difference between RP and MP is the consumer surplus (CS), which indicates the economic gain by the customer for a specific good or service. As this economic gain arises from the difference between the perceived value (RP) by the consumer and the value set by the market (MP), the CS becomes the

economic value added to the consumer from that specific transaction. Internet auction houses such as E-bay have gained credibility by increasing the consumer surplus, therefore adding value and creating positive network effects.

## 2.2 Traditional versus Electronic Markets: Transaction and Agency Costs

### 2.2.1 Traditional Markets

Every transaction bears costs associated with the exchange of goods and services. Transactions can occur in an intermediated or in a disintermediated environment. Traditional economic theory assumes a disintermediated market perspective, where intermediation is meaningless as the resource exchanges in such markets are conducted by entities have perfect knowledge, always trade at fair market prices, and act in a manner that is mutually beneficial in the long term, making market-based transactions frictionless. The assumptions in such a market-mediated network are that participants in this case have complete and symmetric information about each other, are highly rational in understanding the outcomes of their choices, never self-interested and opportunistic, and that the environment is stable and certain. Given such circumstances, transaction costs are low. In reality, however, markets do not function in such a manner.

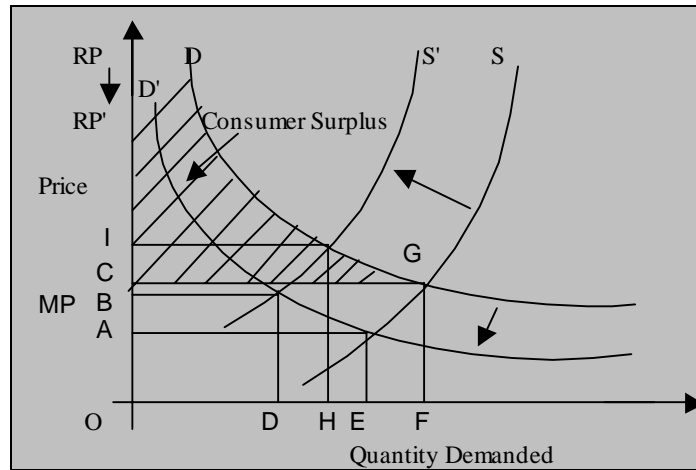


Figure 1: Consumer Surplus in Electronic Markets

In a disintermediated market, transaction costs are borne by the consumer or the seller, the only two entities. For a consumer, costs from searching, negotiating, communicating and contracting with sellers are their transaction costs. If the transaction costs are borne by the consumer, it is reflected in a lower reservation price (RP to RP') caused by a shift of the demand curve to the left (D to D'), decreasing the CS. Similarly, sellers have to search, communicate, contract, negotiate, and promote their products to the consumers, each of which entails transaction costs. If these transaction costs are borne by the sellers, the market price increases (OC to OI) in order to compensate for the costs, creating a deadweight loss (quantity of transactions that did not consummate due to transaction costs) (OF-OH). In both cases, there is a decrease in the consumer surplus, thus decreasing the economic value addition for the consumer. CS is therefore, seen to increase with the decrease in transaction costs. Thus, in trying to alleviate the loss of CS or create market effectiveness, the market tries to organize itself to reduce transaction costs (Coase, 1937). This was the cause for the growth of the firm as an intermediary and aggregator of market resources- increasing benefits, reducing transaction costs, generating consumer surplus, while creating market failure.

While the market mode does seem utopian, it is quite inefficient, making market failure a necessary evil. The notion is furthered by Williamson's (1975) "Markets and Hierarchies", where he finds that free-market failure occurs because entities involved in transactions are limited by and limit each other due to:

- **Bounded Rationality:** The rational system approach characterizes entities as collectives oriented to the pursuit of defined and unambiguous goals. Bounded rationality introduces a form of rationality under the constraints of the environment. The pressures of the environment make it impossible for an entity to consider all possible choices available, as the traditional conception of rationality would assume. In such conditions, organizations, as mediators, try to extend the rationality of the entities.
- **Uncertainty:** In uncertain environments, alternative "market" forms (like organizations) serve to mediate and thus reduce the transactional costs between individuals. The greater the uncertainty, the more is the rationality of the participants limited, making mediation necessary.
- **Information Impact and Opportunism:** This situation occurs when one group has more understanding or information about an exchange than the other group. This disadvantage (if known or unknown) can make negotiations and transactions difficult or increase the risk of the exchange. This information asymmetry can make entities act opportunistically. Opportunism allows for strategic thinking and guile in exchanges. Entities can lie, cheat and steal. One cannot necessarily trust everybody. Therefore agreements and transactions need to be monitored during execution - hence the need to mediate.

The aforesaid issues give rise to more and more incomplete contracts. Hart & Tirole (1999) state that incomplete contracts arise due to:

Unforeseen contingencies: Parties cannot define ex ante the contingencies that may occur because of bounded rationality and must content themselves with signing a contract that does not explicitly mention those contingencies. Anonymity makes it even harder to define contingencies.

Cost of writing contracts: In this case, even if one could foresee all contingencies, they might be so numerous that it would be too costly to describe them in a contract.

Cost of enforcing contracts: In case of a breach in contract, courts must understand the terms of the contract and verify the contracted upon contingencies and actions in order to enforce the contract. With increasing anonymity and a global reach, unless there is a standard agreement on the exact interpretation of terms in a contract worldwide, the costs of enforcing contracts could be overwhelming.

Williamson argues for the failures in "free market" transactions that lead to the need and existence of intermediaries (organizations and hierarchies) to mediate and economize transactional costs. Both Coase (1937) and Chandler (1962) emphasized that organizations arose from free market environments because the benefits of coordinated mediation through hierarchies lowered costs and improved efficiencies. Williamson (1985) agreed with Chandler that for some activities hierarchies are more efficient than markets, emphasizing the economic transaction cost savings achieved by mediating and internalizing uncertain and potentially opportunistic exchanges within the control boundary of an organization.

### 2.2.2 *Electronic Markets*

E-commerce has always carried the essence of free-market mediated transactions, moving towards the utopia of a frictionless market scenario. Transaction costs are found to decrease when information technology is used to facilitate market exchanges, as electronic transactions cost less

than physical market transactions (Bailey, 1998). The arguments for the lowering of transaction costs in e-commerce are because of lower search costs (Bakos, 1997), coordination costs (Malone, Yates, & Benjamin, 1987), and processing costs (Sirbu & Tyger, 1995). This is the basis for EMH (Efficient Markets Hypothesis) and Electronic Communication Effect by Malone, Yates, & Benjamin (1987), which posits that the use of IT in electronic markets reduce product complexity, costs of communication, and asset specificity, thereby eliminating the need for transactions to be mediated by hierarchies. This has been one of the major arguments for the emergence of market transactions. EMH is a valid argument that is reaffirmed by the move-to-the-middle hypothesis (Clemons, Reddi, & Row, 1993), where it states that industrial markets require less matching because of fewer participants included in the market network (Chircu & Kauffman, 2000).

Both EMH and move-to-the-middle hypothesis have potential when the number of actors in such a market-mediated network is few. In addition to the problems of bounded rationality, uncertainty, information asymmetry, and opportunism, e-commerce transactions pose new pressures because of two distinct dimensions: anonymity and positive network effects.

**Anonymity and Incomplete Contracts:** Although it is debatable whether e-commerce is “frictionless”, it is unequivocally accepted that the e-market is indeed “faceless”. Mitchem et al (1997) refers to the problems that arise from this faceless attribute of online transactions. This causes the problem of identity insecurity. Because e-commerce transcends traditional geographical boundaries to encompass the whole globe, it becomes immensely difficult to replicate the physical dimensions of traditional face-to-face transactions. Anonymity also creates authentication problems that may augment opportunism.

**Positive Network Effects:** The growth of the Internet and e-commerce is largely because of its feature of interoperability, integrating a “network of networks”. This interoperable infrastructure has made the Internet a more effective mode than any other communication mode, increasing benefits to all who use the network. Positive network effects and network externalities (Katz & Shapiro, 1985) arise when incumbents derive benefits from new participants. With increasing participants, positive externalities exist and increase the value of the network. The externality also signifies increased competitive pressure as newer players emerge over the Internet, taking advantage of its low barriers to entry. With network externality, the network keeps growing and accommodating newer participants, increasing competition, creating greater number of nodes, greater interactions, and greater anonymity.

## 2.3 Understanding Agency and Transaction costs in Markets

### 2.3.1 *Inducements against Intermediation: Agency Costs*

Intermediaries and middlemen are agents in e-commerce transactions. Fama (1980) found that agency costs (costs originating because of intermediation and borne by the buyer or seller) are high and have to be borne in transactions that are mediated by one or more entities. Agents are middlemen or intermediaries that help facilitate transactions between parties. The agent must therefore have a comparative advantage in performing the task under consideration; otherwise, the principal would have no incentive to engage in a principal-agent relation in the first place. This would imply that the principal has to perform the task herself, thereby reducing costs by saving the agent’s compensation and the principal’s share of the agency costs, but incurring additional production costs.

Intermediaries thus introduce associated agency costs. The most obvious way to reduce agency costs, though, is to abolish the agent altogether. However, with the increase in anonymity and

network size, it becomes necessary to use agents or intermediaries to reduce transaction costs, as long as the agency costs are not greater.

**Scenario A: Disintermediated Markets:** Commerce involves the exchange of resources between parties. Fundamentally, commerce involves buyers, sellers, and intermediaries. In a disintermediated market, the intermediaries are absent, leaving the arena only for the buyers and sellers. Therefore, in the absence of an external player as a facilitator and coordinator, the exchange is disintermediated (Bailey, 1998). Assuming that the transaction costs are fixed across every exchange and every seller sells a specific product, direct linkages exist between the number of buyers (i) and number of sellers (k) with the sellers selling unique but competing products that are demanded by the buyers. The lines (edges) between the buyers and sellers represent the complete set of transactions in the scenario. As every transaction cost,  $C_{TD}$ , is assumed to be the same, the total transactions in this scenario are:

$$C_{TD}(\text{Transaction costs in a disintermediated scenario}) = C_{ik}$$

Here,  $C_{TD}$  increases along with positive network externalities as new entrants augment the current market network. In addition, with the “faceless” dimensions of the adopters, coordination and monitoring becomes more difficult, increasing the  $C_{TD}$ . Lastly,  $C_{TD}$  examines products in their entirety, and does not focus upon specific product attributes and differentiation features, which would increase  $C_{TD}$  even further (Bailey, 1998). A disintermediated market has no intermediaries and therefore there are no agency costs involved in such markets. So, the agency cost,  $C_{AD}$ , is:

$$C_{AD}(\text{Agency costs in a disintermediated scenario}) = 0.$$

**Scenario B: Intermediated Markets:** Intermediated markets consists of three distinct participants: the number of buyers (i), the number of sellers (k) and intermediaries (j), where  $j < i, k$ , as intermediaries act as aggregators of products, services, and information on both buyers and sellers and are therefore constitute a small proportion of the number of buyers and sellers. The intermediary aggregates information for both buyers and sellers. E-bay, Priceline, Mercata, etc. are all intermediaries that aggregate and match buyers and sellers, building on collective bargaining and economies of scale. Assuming uniform transaction costs, the effect of the intermediaries is pronounced. Again, the edges in the network signify the number of transactions in the intermediated scenario, with each cost being the same (C). Therefore,  $C_{TI}$ , the total transaction costs in this scenario are:

$$C_{TI}(\text{Transaction costs in an intermediated scenario}) = C * (ij + jk), \text{ so } C_{TI} = Cj(i + k)$$

As seen from this model, the number of transaction edges in an intermediated market is reduced from  $i*k$  to  $i + k$ , when a single intermediary is used to coordinate a market transaction (Baligh & Richartz, 1967). Although there is an occurrence of a multiplicative effect due to the number of intermediaries, their small proportion makes their impact insignificant, especially when e-markets show a positive network effect.

Intermediated markets, nevertheless, pose the problem of agency cost  $C_{AI}$ , with  $C_{AI}$  greater than the cost of a single transaction in a disintermediated market scenario. Here, the agency costs  $C_{AI}$  are dependent upon the number of intermediaries in the network. Here, the agency costs,  $C_{AI}$ , are:

$$C_{AI}(\text{Agency costs in an intermediated scenario}) = Cj, \text{ where } j = \text{no. of intermediaries.}$$

$$\text{Therefore: } TC_I(\text{Total costs in an intermediated market}) = Cj(i + k) + Cj$$

$$\text{Or, } TC_I = Cj(1 + i + k).$$

## 2.4 Intermediation-Disintermediation Framework

It depends upon the level of aggregation, size of the network, and the perception of uncertainty and opportunism that would denote the importance of agency costs in electronic markets. In uncertain and opportunistic environments with increasing number of faceless entities in the market, the need for authentication, credibility, trust, and non-repudiation is bound to grow. As the network grows in magnitude, agents will start playing a vital role, especially in trust provision, authentication, and assurance, and the agency costs incurred will seem negligible given the immensity of the transaction costs otherwise.

Figure 2 tries to develop and understand the intermediation-disintermediation framework from the aforesaid dimensions of e-commerce: anonymity and network externality. This framework helps ascertain when and whether electronic markets need to be intermediated. It takes a look at an intermediated market and tries to understand where intermediation creates inefficiencies and where it does not. The argument is as follows: Network externalities increase the size of the network, creating an inherent uncertainty as faceless entities emerge. In such cases, the transaction costs increase in unison as there arises a greater need to monitor and coordinate every node in the growing network. Positive network effects lead to very high transaction costs, which increase tremendously once a critical mass of network nodes is attained. So the transaction costs increase linearly with the increase in anonymity and positive network externalities. From the point of agency costs, the intermediated market scenario indicates that intermediaries and therefore, agency costs exist in such a scenario, even when the size of the network is small and anonymity is low. With low anonymity and small network size, participants are normally well aware of existing actors in the network and therefore reduce uncertainty. The presence of an agent or intermediary in such circumstances makes the network incur agency costs without adding any discernible benefits, making intermediation and the associated agency costs unnecessary. On such a premise, it is posited that if agency costs ( $C_{AI}$ ) are greater than the transaction costs ( $C_{TI}$ ), intermediation creates non value-added costs, making disintermediation necessary. When  $C_{AI}$  are the same as  $C_{TI}$ , the market will be indifferent towards intermediation or disintermediation. Whether, at this point, intermediation or disintermediation will occur, will largely depend upon the preferences of the transacting parties. As networks grow in magnitude, it leads to greater anonymity and increased uncertainty, thereby increasing transaction costs. In this condition, agents lend trust, assurance, credibility, while aggregating goods and services, and thereby reducing the transaction costs from interaction with such a multitude of nodes in the network. Here, the transaction costs far outweigh the agency costs incurred by intermediation. It is, in such circumstance, posited that if agency costs ( $C_{AI}$ ) are lower than the transaction costs ( $C_{TI}$ ), intermediation is a prudent option, especially with growing network size and anonymity. Here too, it is assumed that both the agency and transaction costs are uniform and increase with the number of intermediaries and network nodes, respectively, and that the network nodes are greatly outweigh the number of intermediaries.

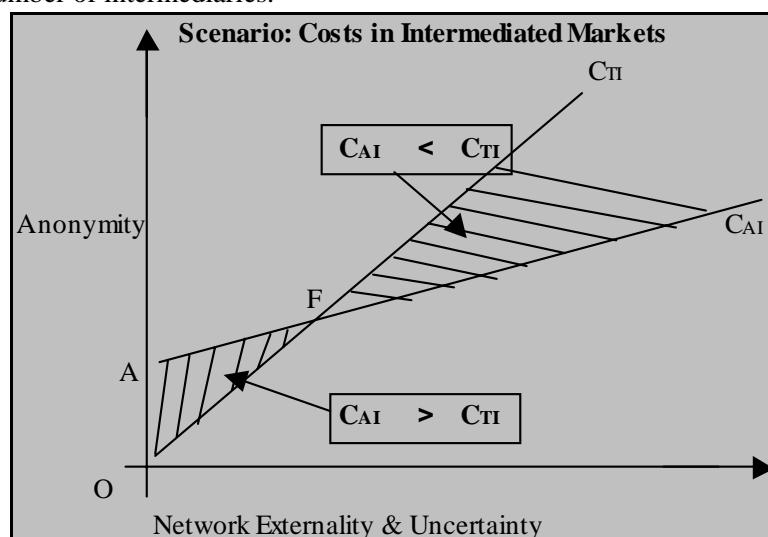




Figure 2: The Intermediation/Disintermediation Framework

*Proposition 1a: Disintermediation is justified if agency costs ( $C_{AI}$ ) are greater than or equal to the transaction costs ( $C_T$ ), making intermediation unnecessary by generating non value-added costs.*

*Proposition 1b: Intermediation is justified and is a prudent option if agency costs ( $C_{AI}$ ) are lower than the transaction costs ( $C_T$ ), given network externalities, anonymity, and uncertainty.*

*Proposition 2: With increasing anonymity and network externalities, intermediation decreases transaction costs, therefore adding economic value by increasing consumer surplus.*

## 2.5 Intermediary Roles in E-commerce

E-commerce is mostly about information retrieval, evaluation, and validation between transacting entities. Transactions involve the gathering of information of a product or service followed by the processing of the information in order to make a transaction decision (Bailey, 1998). This makes the role of information essential in the digital world where tangibility is absent and where information is the underlying currency for integrity and reliability of goods and services transacted. With electronic networks having contracted time and distance, information has flooded from every corner of the globe. As the digital networks grow, more and more information is added to the current network. Parties transacting over digital networks become increasingly wary of the relevance and integrity of the information they receive, realizing that assessing the integrity of information on the ever-increasing participants in a network is infeasible. While this is a sheer exhibition of network externality, it forces the network participants to rest their confidence on an intermediary who can aggregate, assimilate, and authenticate the integrity and relevance of such overwhelming information. Therein lies the increasing significance of physical (Malone, Yates, & Benjamin, 1987) or information intermediaries (infomediaries) (Hagel & Singer, 1999).

Electronic markets serve three functions (Bakos 1998) - First, the market match buyers and sellers, which includes the determination of product offerings, the search of buyers for sellers and sellers for buyers, and price discovery. Secondly, the market must facilitate transactions that may consist of logistics, settlement, and trust. Lastly, the market must support an institutional infrastructure that encompasses the legal and regulatory portions of the exchange. In electronic marketplaces, intermediaries are found to provide the first two functions, making their presence extremely conspicuous. The impact these intermediaries have on consumers in typical electronic transactions can be traced on examining their presence in the market functions.

**Matching Buyers & Sellers:** Leebbaert (1998), Bakos (1998) have all examined the growing role of intermediaries as a buyer-seller matchmaker. Such matchmaking roles can be found in general or specific directory services that help consumers find producers by categorizing Web sites and providing structured menus to facilitate navigation (Yahoo, Embroidery Directory, Jeff Frohwein's ISDN Technical Page). Other services provided are providing product features offered by sellers (which.net, compare.net), product, service and information aggregation such as Ebay, Cybersuperstores, etc. Similarly, search services exist as in Infoseek, Google, etc. These search sites provide users with the capabilities for conducting keyword searches of extensive databases of Web sites/pages. Intermediaries such as Hagglezzone, Priceline, also help match seller offerings with buyer preferences.

**Facilitation of Transactions:** Spulber (1996) identified the roles of intermediaries as transaction facilitators. Physical intermediaries such as UPS, Fedex, etc, assist in reduction of delivery lead time for logistical purposes. Intermediaries also provide transaction security such as MarketNet

(Yemini et al, 2000) while other financial intermediaries help ease the transfer of funds such as electronic equivalents to writing checks (Checkfree), paying in cash (Digicash), or email-based payment (Paypal).

**Trust & Assurance:** Hagel & Singer (1999), Froomkin (1997) have all emphasized on the critical role played by intermediaries in providing trust and assurance in transactions. Bailey & Bakos (1997) state that intermediaries will become the trust providers in electronic commerce. Other authors such as Nelson et al (2000) etc., have introduces new intermediary roles such as continuous online auditing agents. Intermediaries are seen to provide third party assurance services and this trust provision encompasses most industries. Agent services for corporate reporting, online auditing (FRAANK, EDGAR), along with other forms of certification services, therefore, becomes extremely important in the electronic market scenario as intermediaries providing reliable quality and service.

## 2.6 Conclusion

The research on intermediaries in e-commerce has primarily focused on the roles they play and functions that they perform, for example, aggregation (Bailey & Bakos, 1997), search (Bailey & Bakos, 1997; Sarkar, Butler, & Stienfield, 1995), trust (Bailey & Bakos, 1997; Lu, 1997), etc. This study attempted to examine why intermediation may exist in markets and its impact on consumer surplus. Using transaction costs and agency costs as a premise, it is found that intermediation becomes a necessary evil for adding economic value. In an expanding network, every instance of intermediation involves agency costs, absorbed by the producer and borne by the consumer. However, with an increase in the size of networks, information acquisition becomes expensive, as the consumer, producer, or involved parties may have to access a vast number of nodes for gaining relevant information. Parties interested in commerce constantly query the network for attaining relevant information. The greater the number the nodes, given the fact that intermediaries are absent, the search and retrieval of information will result in increased transaction frequency, therein increasing transaction costs. In such cases, disintermediation seems appropriate only when agency costs for a specific information is greater than the transaction costs involved in the exchange. However, as transaction costs rise die to increased network externalities and anonymity of transacting parties, the need for intermediation becomes important as they provide assurance in a transaction. In addition to providing trust and assurance in uncertain conditions, intermediaries are also found to provide key services of matching buyers and sellers and facilitating transactions.

The limitation of this paper is largely because of its generic treatment of intermediation at a very macro level. The dynamics of market modes and structures largely vary across industries. For example, oligopolies would not undergo intermediation or disintermediation the same way that a monopolistic market would. Again, intermediation in industries is also fueled by the specific attributes such as control of co-specialized assets, ability to form alliances, achieve economies of scale, etc (Chircu & Kauffman, 2000). Other factors such as asset specificity, resource availability, etc, also impact the degree of intermediation or disintermediation. We assume that in expanding markets fueled by a convergence of computing, communication, content, and consumerism, intermediaries will become reliable interfaces to connect to an unknown world beyond.

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