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## The Role of Information Technology on Stock Market Development

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### Abstract

The purpose of this paper is improvement of technology concepts, understanding, traditional and electronic stock trading. This paper illustrates the role of information technology on capital market development. Appropriate applying of IT will be stake for developing electronic trading processes. No doubt, the cultural, understanding IT concepts and applying of this will increase stock market efficiency. In this paper have been tried to examine the role of IT on stock market development with review of research literature and prior researches. In the end of article, after explain of prior researchers findings have been presented the solutions for IT development in stock market.

**Keywords:** Information Technology, Stock Market, Development Indicators

### Introduction

New era, information is a new discussion that growing speedy. It is creating fundamental changes. These changes are due to new business strategies, variation, modern entertainment and arts. Three main elements of IT is hardware, software, think ware (knowledge management). Creation of this field is due to huge development in Computer field. However, computer field is the subset of it. In a word, It has independent quietly status. Today, it is changing increasingly the global and these changes are observable in economic, culture and social fields. Nevertheless, It is at first the way.

In industrial era, the basic condition for the trade is the exchange of property in the market area, and the government's role is to protect property market. However, living in the electronic area needs access to available information in communication networks. In addition, in traditional economic, individual must find the big market for profit. Even so, in internet economic, successful businessman such as Amazon have been find profit is in create SME markets. In these markets, millions customers are following for discover a way to separation of the income per transaction. Internet indexes are due to create low-cost and small markets by one to one and one to many

communications for around the world millions persons. ICT provides lot opportunities for limit of economic and social inequalities and supports to logical wealth. However, Economic changes are destroyed the more business, but they have created numerous job opportunities. Traditional banking system has disbanded completely, and electronic payment has been replaced. Possibility, IT is a factor that it has a strong effect on the development stock market. Theoretically, some research purposed argument about potential benefits of impact IT on financial section. For example, Lonis (1997) suggest telecommunication and computers changes affected financial services quality and financial systems structure. In addition, global bank (1998) has announced advertisement in field of communication is a force for economic positive changes transfer to other countries. Unfortunately, in third World countries include Iran, depth thought and accurate decisions have changed to Surface though and Immediate decisions (Hosseini, 2003). Thus, in this paper have been tried to after explore of literature and background research, examine how use of information technology in the stock market. Finally, present paper offers strategies for this sector development.

## **Literature Review**

### ***Information Technology***

Information Technology is defined as a philosophy of applying complex tools to complex information management problems using a tool-oriented, problem-solving methodology. These tools include information processing, save, gather, distribute, transfer and assurance of. The target of IT application is increase awareness of human. The reason IT disadvantages is incorrect use of this system, frequently. Incorrect and incomplete design by information systems designers and IT engineers or incorrect use of information technology by users often creates problems and disorders. In present era, one of the most important business processes in IT management is implementation, development and maintenance of information systems. Thus, managers and organizations are faced with new challenges in this field. These challenges are considered in the areas of organization, management and technology (Bahrami, 2008).

### ***Stock market***

The history of stock exchanges can be traced to 12th century France, when the first brokers are believed to have developed, trading in debt and government securities. Unofficial share markets existed across Europe through the 1600s, where brokers would meet outside or in coffee houses to make trades. The Amsterdam Stock Exchange, created in 1602, became the first official stock exchange when it began trading shares of the Dutch East India Company. These were the first company shares ever issued. By the early 1700s there were fully operational stock exchanges in France and England, and America followed in the later part of the century. Share exchanges became an important way for companies to raise capital for investment, while also offering investors the opportunity to share in company profits. The early days of the stock exchange experienced many scandals and share crashes, as there was little to no regulation and almost anyone was allowed to participate in the exchange. Today, stock exchanges operate around the world, and they have become highly regulated institutions. Investors wanting to buy and sell shares must do so through a share broker, who pays to own a seat on the exchange. Companies with shares traded on an exchange are said to be 'listed' and they must meet specific criteria, which varies across exchanges. Most stock exchanges began as floor exchanges, where traders made deals face-to-face. The largest stock

exchange in the world, the New York Stock Exchange, continues to operate this way, but most of the world's exchanges have now become electronic (Jafari, 2011).

The stock market is an organized market for saving holders can be search a good place for investment. They should by brokers to Buy and sell of stock. Stockholders benefiting with buy of stock and sell of that in right time and by take dividend after end of financial year. In stock market, stock price are affected of internal factors (the status of Companies listed on the Stock Exchange) for example: changes in the status of directors board, financial status of companies and financial policies, external factors like economic and political factors.

Generally, exchange hall are divided into three categories:

1. Commodity Exchange: It is an organized market that trades certain commodities. Such as; Gold exchanges New York or Australia wool exchange.

2. Foreign Exchange Market (Forex): is a form of exchange for the global decentralized trading of international currencies. Financial centers around the world function as anchors of trading between a wide range of different types of buyers and sellers around the clock, with the exception of weekends. Different countries money trades in this market. Foreign currency transactions are done based on the price volatility of various currencies against each other.

3. Securities Exchange: Securities trades in this market. Official market where trade share, commodity, currency and stock by brokers (who are supervised by the Stock Exchange. This market benefits is including, incoming through receiving dividend and increasing market price stock, quick liquidity ability, participation of buyers in future decision-making companies, make ensure of investment Possibility with authorized and available information of firms (Bahrami, 2008).

The study of Levin in 1997 has been done in World Bank Research scholarships. He examined relationship between exchange and banks development with industrial growth in 38 developing countries studied. Some of the indicators used in this study as following:

- The ratio of stock trading volume to liquidity: this index reflects the degree of using private sector resources in stock.market.
- The ratio of stock trading value to net fixed capital: This reflects degree of public participation in investment.
- The ratio of stock current value to GDP: that shows the activity volume of stock market in GDP.
- The ratio of shareholder population to total population: this indicates the position of exchange in saving basket people .
- Activities proportion shows trading level vs. size of the market (Levin, 1997).

### **Background Research**

The single entrepreneur who initially finds it hard to get funds, develop the product, and find customers often develops a new technology or product. However, if the product is good, customers eventually line up and investors flock. Other firms then move in to make the product and may drive the innovator out or acquire him. Whether he reaches the initial public offering (IPO) stage or hi is acquired by a listed firm, though, it takes time for the innovator to add value to the stock market. Indeed, the innovation firstly may reduce the market's value because some firms, usually large or old, will cling to old technologies that have lost their momentum. In addition to the evidence that replacement has increased in the past two decades, several sources suggest that the pace of

technological progress has risen too. In the late 1960's IT made up only 2–3 percent of equipment investment. Today it accounts for more than half. Patent applications by U.S. inventors have almost doubled, from 71,089 in 1970 to 120,445 in 1996 and R&D spending by businesses has risen sharply, from 1.0 percent of GDP in 1970 to 1.4 percent in 1996 (Greenwood and Jovanovic, 1999).

In another study, has suggested that stock markets are neither a necessary no sufficient condition for promoting the development of ICT. Many countries, particularly in Northern Europe but also elsewhere, have been able to achieve a high degree of ICT development without a central role for venture capital, IPOs and stock markets. Other countries, such as Britain that have flourishing stock markets, have failed to become leaders in ICT development. Econometric analysis did not reveal any robust systematic relationship between indicators of stock market development and those of ICT development. Their findings show the more application of IT due to more decrease of value, but IT destroyed the old firm and will enter new firm the market (Hobjin and Jovabonic, 2000).

The paper of Lucas et al (2002) applies an extended version of the resource-based view of strategy to an 18- year history of investments in information technology by the New York Stock Exchange. The extended RBV predicts that firms will use information technology to enhance their existing resources and to create a system of resources for competitive advantage. It also suggests that once a firm has chosen to compete with technology, it will face a continuing cycle of technology investment to remain competitive. Their paper presents two propositions about IT investments at the Exchange and tests them with qualitative and quantitative data from several different sources. The extended model helps to explain the strategy and IT investment pattern at the Exchange. The results provide insights for firms that invest in information technology to create a system of traditional and IT resources to obtain a sustainable competitive advantage (Lucas et al., 2002).

Ngassam and Gani (2003) examined effect of information and communications technology on stock market development in a sample comparing of emerging markets and high-income economies. Their empirical results of the least squares dummy variable model confirms that personal computers and internet hosts as the two ICT variables having strong positive effects on stock market development. Their results also indicated strong positive effects of market capitalization and credit to the private sector as non-ICT contributors to stock market development. Controlling for income and technological differences, the finding show emerging market economies have already seized an opportunity to leap frog the high-income countries that is, by going straight from underdeveloped networks to fully digitized networks, by passing the traditional analog technology. As such, this leap frogging is positively enhancing their stock markets (Ngassam and Gani, 2003).

Hovav and D'Arcy (2005) examined whether the market penalizes firms that produce substandard IT products. They use the event study methodology to assess the impact of public virus announcements on the stock prices of responsible IT vendors between 1988 and 2002. Their results show that the market reacts negatively to the production of flawed Information Technology in approximately 50 %of the cases. However, this negative market reaction is not statistically significant over extended periods and is limited to announcements involving certain types of defects (i.e., IT products that contain computer viruses). There was no statistically significant negative market reaction for announcements involving IT products that are susceptible to computer viruses. Their analysis implies that unlike in other industries, market forces alone cannot use as an effective control mechanism for the production of substandard IT products. Their study concludes that under these present conditions, IT vendors have little economic incentives to invest in defect-free computing (Hovav and D'Arcy, 2005)

Kummerow and Lun in 2005 years prepared the paper as "information and communication technology in the real estate industry: productivity, industry structure and market efficiency". They expressed that Improvements in information and productivity may lead to important long-run changes in business processes and industry structure tending to favor larger firms and promoting specialization of functions. Changing the information structure of real estate decision systems could change system dynamics and allocation improves efficiently. On the other hand, under different institutional arrangements, better information could increase the amplitude of real estate cycles and destabilize economies (Kummerow and Lun, 2005).

Toivonen et al., in 2007 years examined the contribution of IT systems and tools to the emergence and use of different types of knowledge in a firm. We divide knowledge into explicit, tacit and potential and argue that these three types of knowledge characterize firms' three main functions - operational effectiveness, gradual development, and innovation, respectively. Based on their examination, the main part of IT applications serves dissemination, storing and acquisition of explicit knowledge. They present two ways: the use of IT for the development of social capital in a firm, and the use of external experts—knowledge-intensive business services (KIBS)—as supporters in firms' knowledge functions linked to IT (Toivonen et al., 2007).

According to the experimental results of Lo and Lie (2008), communicators will choose a tool with high information richness when faced with a long-distance communication situation involving a highly equivocal task and a low degree of trust for the other party. However, media selection decisions for communication over short distances are not affected by either task equivocally or trust (Lo and Lie, 2008).

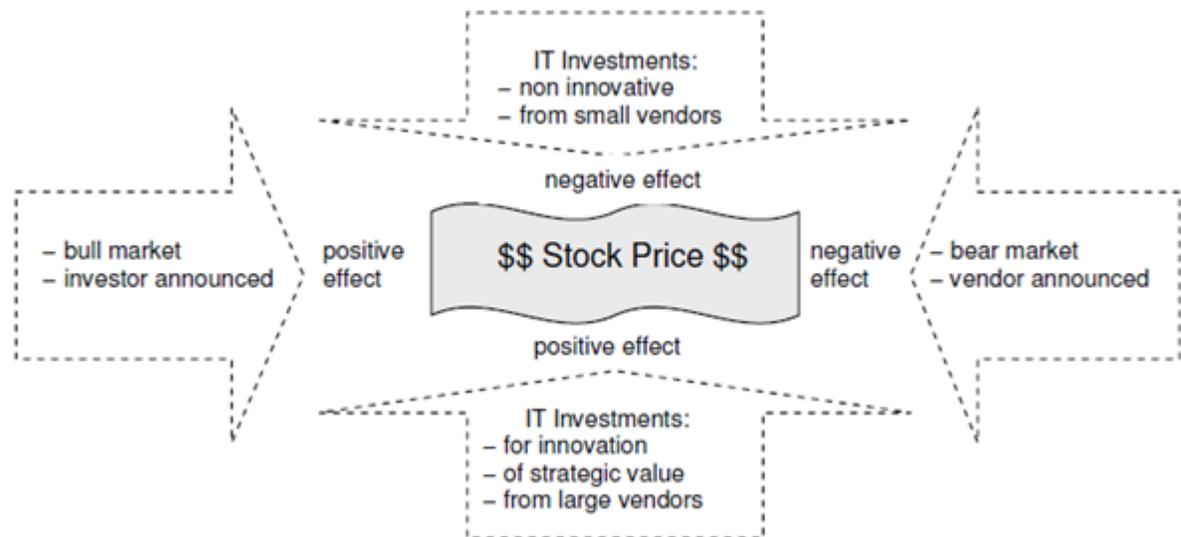
Atefeh Bahrami (2008) in her research described the effect of ICT development indexes on Securities Exchange development indexes. She used of consumer spending overall indicator for examining the overall effect of ICT on Securities. She selected the Mobile and Telephone penetration, the number of Internet users and the number of PC as ICT development indexes. In addition, she selected activity ratio, liquidity ratio and the number of companies listed on the exchange as Securities Exchange development indexes. Then, she divided the countries based on indicators of financial development (the ratio of cash to GDP) to two groups countries (bank-driven and exchange-driven). She has also examined Impact of ICT on this country economic growth. her statistical population were the countries that in view of Iran's exchange organizational were the low per capita income countries that includes; Argentina, South Africa, Brazil, Peru, Thailand, China, Sri Lanka, Philippines, Malaysia, India and Iran. Her findings suggest that all indicators of ICT development have been significant effect on Securities Exchange development indexes. Also, in two groups' countries, effect of ICT on economic growth is positive (Bahrami, 2008).

Ashraf and Joarder have been done a research as "The effect of information technology on stock market trade volume and volatility: case for Dhaka stock exchange in Bangladesh" in 2009. They focused on Internet. Their hypothesis was the different between mean of trade volume from 2004 Jun to 2005 October and mean of trade volume from 2005 November to 2007 Joan. Their results showed that the "Net" has a significant impact on these two parameters of volume and volatility of Dhaka stock market (Ashraf and Joarder, 2009).

Bharadwaj et al. (2009) examined effect of IT failures on the market value of firms using the resource-based view of the firm and event study methodology. Their study analyzes how firms are penalized by the market when they experience unforeseen operating or implementation-related IT failures. They selected 213 newspaper reports of IT failures by publicly traded firms, which occurred

during a 10-year period for sample. Their findings show that IT failures result in a 2% average cumulative abnormal drop in stock prices over a 2-day event window. The results also reveal that the market responds more negatively to implementation failures affecting new systems than to operating failures involving current systems. Further, the study demonstrates that more severe IT failures result in a greater decline in firm value and that firms with a history of IT failures suffer a greater negative impact (Bharadwaj et al., 2009).

Narcys and Heinz Roland prepared an article as "stock market reaction to IT investments: towards an explanatory model". They proposed a conceptual model describing the factors that are influenced IT investments based on market reaction findings of major event studies on IT implementation announcements. Their model is following as below:



Source: Narcys and Heinz Roland, 2009.  
Figure 1.

**Conclusions**

Today, it is necessary that must be preparing intellectual and cultural fields of IT development, because there are a direct relationship between the nation economic health and the level of their skills. IT infrastructure development is a multi-step process. In knowledge- based communities, issues such as educational development and cultural development must be attention. "IT as knowledge" and "IT as industry" have a high-degree of entrepreneurship. Proper utilization and managed development of IT can have beneficial effects in economics body. The issue of cultural has a special place in the field of shareholder understanding with modern methods of trading (e-trading), since the application of these methods were used to develop the capital market. This is possible with internet trading development and reassuring investors about their safety and property information. Therefore, the analysis performed expertly is necessary for create change and innovation in methods and executive mechanisms exchange. This paper suggests that all transactions processed of brokerage institutions must be computerization and their trading systems should be electronic, for the reason that such institutions are important in capital markets. Today, in addition to, buy and sell must be done by Internet; all trading systems must be computerized. Organizations need to

experienced managers for modern methods growths. Therefore, they should investment in manager education (Wallis, 2005). As mentioned above, more researchers intentioned to IT. Today, all people want to take advantage of each other. Create IT systems especially in capital market are a factor for made easier to works and easier to achieve goals. Future researchers can use this paper to examine variety variables.

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