Reshaping retail in India: An exploratory study of technology adoption for competitive advantage in the Indian Retail Industry

Ankit Sharma
Indian Institute of Information Technology and Management, Gwalior
ankitsharma.iiitm@gmail.com

Dr. Arti Bakhshi
Department of Psychology
University of Jammu, Jammu
artibakhshi@gmail.com

Abstract

The Indian Retail Market is witnessing a revolution. The increased consumer demand, increased availability of real estate, allowing of FDI in retail and rationalizing of the tax structure are creating the foundation for significant growth in the organized retail sector thus increasing the competition among the firms. Information technology can reinforce the competitive advantage for the retail firms. The research presented in this article proposes a framework and then critically evaluates the factors that affect the adoption of the Internet through the application of descriptive statistics on a set of questionnaire responses to explore the nature of relationship between each of the derived factors. The results show that consumer perceptions and customer centricity when coupled with higher value proposition of the technology being adopted have the greatest influence on Internet adoption. A further benefit of this study to a business audience is that it provides some important insights into the areas that should be addressed when a retail organization develops an Internet strategy.

Keywords: Consumer Perception, Information Technology, Organized Retail, Technology adoption

1. Introduction

India has close to 13 million retail outlets, the highest in the world and the retail industry is close to Rs 9 trillion thus generating more than 10 percent to India’s GDP (KPMG, 2006). Retailing in India is disorganized and one of the least evolved industries as it suffers from lack of management talent, poor access to capital, unfavorable regulations and non-access to best practices. But the increased consumer demand, increased availability of real estate, allowing of FDI in retail and rationalizing of the tax structure are creating the foundation for significant growth in the organized retail sector. The organized retail sector is projected to grow at the rate of 25%-30% p.a. and
is estimated to reach Rs.1000 billion by 2010 (CII and McKinsey, 2000). In such a scenario of rapid growth, the preparedness of Indian retailers in terms of having appropriate formats, scalable processes, appropriate technology and relevant organizational capability will be crucial to their success. The retailers should move now or forego prime locations and market positions that will become saturated quickly (AT Kearney, 2005). So opportunity is large and the retailers who wish to capture the market need to begin working towards it immediately. Even though there may be easy pickings, the large opportunities will require significant effort, bold investments, and a desire to serve the customer better with vision for the future.

Thus the traditional Indian local markets and stores are witnessing a retail revolution. Heralding the revolution are chains like Big Bazaar, FoodWorld, Shoppers’ Stop, Sabka Bazar, ITC, Bombay Dyeing, Murugappa & Piramal groups etc. The planned entry of Reliance, Bharti and Walmart are an indication of the growth this segment is set to witness. Western retailers namely Tesco, Marks and Spencer, Next, Body Shop have shown interest in the country, so a fierce competition between domestic and foreign retail companies is inevitable. In such a competitive scenario Information Technology (IT) could play a significant role for gaining competitive advantage by developing sourcing and merchandising system, customer management capabilities, operational expertise and stock management. According to Pyle (1996), the Internet’s, “global connectivity opens up new avenues for business in a manner that traditional commerce conduits cannot match”. From the perspective of retailers, e-commerce offers efficiencies in the form of increased market access and decreased operating and procurement costs (Rosen and Howard, 2000). The western retailers have developed, and tested business models and IT implementations which save the domestic retail firms from reinventing the wheel. But there is a need to take Indian conditions into consideration for developing a product if one wants a success out of it.

So for firms to be successful they must adopt latest technologies and adapt them to the specific conditions in India. At present how to develop and effectively adopt IT is especially important for the Indian retail firms. Therefore, a framework is needed to structure the complex system of effects of different factors, and develop an in-depth understanding of factors affecting IT adoption in the Indian Retail Firms. The research presented in this article proposes a framework and then critically evaluates the factors that affect the adoption of the Internet through the application of descriptive statistics on a set of questionnaire responses to explore the nature of relationship between each of the derived factors and to evaluate which of the derived factors is most influential in
determining the resultant level of IT adoption. It was envisaged that by addressing these objectives, important insights into how retail organizations should approach the task of developing an Internet strategy might be generated. Furthermore, the experiences of retail companies in Indian retail sector would allow objective comparisons to be made with studies from a variety of other countries and sectors.

2. Literature Review

Prior literature provides us with a rich foundation on which to build a research framework for the study of technology adoption and innovation. This section seeks to review the work of previous authors who have conducted studies of the factors likely to influence Internet adoption, and thus develop a framework that will guide the execution of this research study.

Technology Adoption Model (TAM) is specifically tailored to understand the adoption of computer-based technologies on the job or in the workplace and it has proven to be suitable as a theoretical foundation for the adoption of e-commerce as well (Moon and Kim, 2001). The Technology Acceptance Model proposes that perceived ease of use and perceived usefulness determine an individual's intention to use a system. The intention to use serves as a mediator of actual system use (Davis, 1989).

Teo et al. (1997) examined the factors affecting Internet adoption among large businesses based in Singapore using a contingency model. The work concluded ‘that organizational and technological factors were more important than environmental factors in the adoption of the Internet’. In particular, aggressive technology policy, compatibility of the Internet with organizational culture and infrastructure and top management support were the most significant contingency factors affecting Internet adoption. Relative advantage was also considered to be important but to a lesser extent.

Vadapalli and Ramamurthy (1997) explored underlying motivations of business adoption of the Internet based on their study of large US-based communications companies. They found some support for their proposition that organizational boundaries, transaction costs, economics and organizational cognition were determinants of business adoption of the Internet. In addition, they suggest the inherent self fulfilling characteristics of the Internet affect levels of use: the greater the benefits, the greater the level of use of the Internet. Furthermore, adopters need to perceive the potential value of the technology
before they adopt. Griffith and Krampf (1998) have previously suggested that the web’s ability to process sales orders is probably the most compelling reason for adopting the Internet.

To study adoption of general technological innovation, Tornatzky and Fleischer (1990) developed the technology-organization-environment (TOE) framework, which identified three aspects of a firm’s context that influence the process by which it adopts and implements technological innovation. Organizational context is typically defined in terms of several descriptive measures: firm size, firm scope and employee attitude. Technological context describes both the internal and external technologies relevant to the firm. Environment context is the arena in which a firm conducts its business, its industry, competitors, access to resources supplied by others, and dealings with government (Tornatzky et al., 1990).

The retailers directly interact with the customers so their perceptions and behavior towards the technology adoption are of paramount importance. It will be the customer who will benefit from and use the technology so they need to kept in mind before considering adoption of the technology. The technology of e-commerce decides what can be offered to customers, but only customers determine which of those technologies will be accepted (Hsu, 2003). So the challenge is to extend the benefits of technology to the customers, by understanding their needs and designing technology that is relevant to their lives.

Thus the literature review provides evidence that there are a number of different factors affecting Internet adoption. However, there appears to be relatively little agreement between these pieces of work as to the identity of such critical factors. Consequently, given the global nature of the Internet phenomenon, it is increasingly important that further sector and country-specific studies are undertaken so that experiences can be shared and objective comparisons can be made.

3. Research Model for IT adoption in the Indian Retail firms

A variety of factors have been hypothesized to result in successful IT adoption. In order to find the factor in a logical and systematic way, we use an extension of the TOE (Technology-Organisation-Environment) framework. After an India centric study of the retail sector, the TOE framework has been extended by including another aspect: consumer context. In addition the consumer context takes into consideration, the behaviour and perceptions of the person buying and purchasing product or services
from the retail firm. Although specific factors identified within the four contexts may vary across different studies, the TOE framework has a solid theoretical basis, consistent empirical support (Zhu et al., 2002), and promise of applying to technology innovation domains. We adopted this framework along with the consumer context in studying the IT adoption in Indian retail companies to develop a novel approach regarding the IT adoption by the Indian Retail Firms.

4. TOEC Framework

The research model proposed in this study is illustrated below in figure 1:

![Figure 1: TOEC Framework](image)

4.1. Technology context

Technology context is one of the most important influences behind the technology adoption in the retail industry. The technology competence, value proposition of technology and technology integration are chosen as adoption drivers for it.

Technology competence comprises of the IT awareness, IT infrastructure, IT professionals and the IT expertise. IT awareness means understanding the technologies and their application in the business so that intelligent technology based solutions can be developed. IT expertise means employees knowledge about the technology. Higher the degree of technology competence, more likely will be the timely and efficient implementation of IT in the firm.
Businesses adopt new technologies to gain competitive advantage, beat existing competitors, prevent new competition, and to improve profit. The cost associated with technology and its maintenance, expected benefits i.e. ease of merchandise management, customer data collection and the complexity of the implementation determines the value proposition of the technology. **The greater value proposition and the return on investment the technology has for the firm the more likely it is to be implemented.**

Technology integration is the compatibility of the technology with existing systems and the ability for data integration. The relationships with customers are developed and maintained using multiple touch points so the customer view needs to be integrated. The combination of the technology, processes and services are needed to create and maintain an accurate, timely and complete view of the customer across multiple channels, business lines and enterprises otherwise it leads to low efficiency. So **firms with good technology integration mechanism will be more likely to conduct IT adoption.**

### 4.2. Organization context

Factors of organizational context are also significant for IT adoption in firms. They give an indication of the resources the firm possesses. The resources include equipment, facilities, funding, employees required for the completion of the project. The firm size, firm scope and the employee attitude are the key adoption drivers in the organizational context.

Firm size is determined by the number of employees, size of the target market, capital invested in the firm. Larger firms have more resources to be used and benefits of IT adoption are also greater to these firms. **So larger the firm, more probable will be IT adoption.**

Firm scope refers to the area of operation of the firm and its extent of operation. The retail companies have a huge number of outlets and thus maintain a complex distribution channel and supply chain. The firms after IT adoption will benefit from efficient merchandise management, lower transaction and communication costs. Moreover advance planning and scheduling, inventory management, and transportation management would be made easy and efficient. **The firms which have a pan Indian presence and have a bigger scope are more likely to conduct IT adoption.**
Employee attitude refers to the way of thinking, behaving and feeling of the employees with regards to change occurring due to the IT adoption. People possess a resistance to change due to the loss of jobs and change in the work mechanism and in order to overcome this, better communication, efficient training for using the new technology is required to better manage the change due to technology adoption. **Better the change management plan for the employees, the more quick and timely the IT adoption will be.**

4.3. Environment Context

Environment context is the domain in which the firm conducts its business. It includes its competitors, trade partners, government and the location of operation.

Competitors are one of the important factors leading to the IT adoption. If any of the competitors have adopted new technology then it becomes necessary to implement IT to gain competitive advantage and sustain itself in the market. **The more the number of competitors, the more cut-throat will be the competition and more probable is the IT adoption.**

Trade partners are the vendors or any party with whom business is conducted. Retail firms have a large number of trade partners both upstream and downstream. The adoption of compatible IT by the trade partners goes a long way in the easy and profitable IT adoption in the retail firm. So a firm's IT adoption will be fully successful when all the trade partners adopt compatible IT as well so that business transaction could be carried out electronically. **Firms will be more likely to adopt IT when the trade partner adopts compatible technologies.**

Governmental effect can act as a boon or a bane for the IT adoption in the firms. The government can provide supportive laws and policies for favorable investment climate which act as a fillip required to make the industry grow. The reduction in FDI restrictions, regulation of the real estate market and the introduction of cyber laws has made the IT adoption in the retail firms both easy and profitable. **So firms with supportive government are more likely to adopt IT.**

Location of operation is a significant adoption driver as far as Indian perspective is concerned. The firms with their operations in the big cities (Metropolitans and Class A) have the general populace possessing favourable psychographic attitude, computer
knowledge and international exposure. The wider availability of products, greater market and consumerism among the urban people are also some of the factors that call for IT adoption. **So firms with their area of operation in big cities are more likely to perform IT adoption.**

### 4.4. Consumer context

People perspective is also a significant combination of factors for IT adoption in the Indian retail industry. It is the people who have to change the way they work to accommodate the new technology, so the adoption of technology is about empowering people and not about the technologies they use. Hence consumer context is one of the most important contexts of the technology adoption in the retail firms as the retail firms directly deal with them being at the end of the supply chain. The factors include the consumer perceptions, price sensitivity of the Indian consumers, the customer centricity of the technology adopted, and behavioral intentions of the user.

Consumer perceptions have a strong bearing on the success of the technology being adopted in the industry because it is the consumer who will ultimately use and benefit from the product. The customers perceived usefulness, perceived ease of use, cognitive and socio-physiological behaviour determines the adoption of technology. **The more supportive behaviour customer has, the more likely the firm will adopt IT.**

The Indian customers are the one the most price sensitive customers (KPMG, 2006). Price sensitivity is the extent to which price is a criterion in the customer's decision making process; thus a price sensitive customer noticing a price rise switches to a cheaper brand. So the expenses associated with purchasing and implementing the technology must be considered along with the costs of maintaining the technology throughout its useful life should be kept to optimum, so the price hike for the products and services offered can be kept to minimum. **So the cheaper the product development and maintenance is the more likely the adoption of IT will become.**

A customer centric technology must monitor customer interaction, understand customer buying behavior and customer satisfaction. The measurement of demographic and behavioral characteristics, as well as perceptions and preferences of the consumer should be enabled in the technology being implemented. So the technology should be based on its relevance to the consumers keeping in mind the users needs. **The more**
customer centric the technology the more quickly it will be adopted and the more successful it will be.

So technology, organization and environment context along with the consumer context are integrated into our TOEC framework to study the factors affecting IT adoption in the Indian retail firms.

5. Research Methodology

The chosen research instrument was a questionnaire as it offers the maximum potential to produce results that are generalisable in terms of the population (McGrath, 1982). In our present study, questionnaires were used to survey Information Technology and Management students in order to determine the factors which in their opinion critically affect the IT adoption in the Indian retail firms. Ideally the survey should have been conducted based on the sample of retailers but due to the time and cost associated with such a survey it was not done. Students turned out to be the most valuable participants as they were convenient to access and they possessed extensive knowledge about the current retail environment in India.

So based on the literature, we developed and tested a questionnaire that solicited information from the respondents regarding the factors affecting IT adoption in the Indian retail firms. The research questionnaire was designed, pre-tested and based on the feedback the authors developed a survey instrument for this study. The participants in the survey were university students. To qualify for participation in the study, the participants must have had a course in retail management as a part of their curriculum.

6. Results and Conclusions

The study was conducted during October - November 2006. One hundred fifty (150) were distributed to participants out of whom one hundred and seventeen (nearly 78%)
usable questionnaires were returned and used in the study. The coverage was diverse (refer Table 1) and transcended an age, gender and education bias. The demographic characteristics of the respondents are provided in Table 1. The respondents were mostly young people; however significant portions (~26%) were older. The men respondents were almost equal to the number of women respondents. The respondents were asked on a Likert scale to express their opinions and perceptions. Respondent’s data was collected and analysed, with simple descriptive statistics we were able to find the critical factors affecting the IT adoption in the Indian retail firms.

Three "technological context" factors were tested but one was found to have significant impact (refer table 2) on "IT adoption", namely value proposition. The respondents perceive that the availability of low-cost hardware, telecom with world class infrastructure has made the IT adoption possible and less costly. Moreover the technology adoption adds a unique value to the organization’s offering to its customers through their operations and differentiates its products from competitors thus affecting IT adoption. In the environment and the organisation contexts the respondents felt that location of operation and firm scope are the important determinants of IT adoption in the Indian retail firms respectively.

Most of the respondents felt that the consumer context is one of the main determinants of the IT adoption in the Indian retail firms as they ranked consumer perception(~38%) as the most important factor followed by the customer centricity(~31%) as the significant factors affecting the "consumer context". The respondents felt that the people have to change the way they work to accommodate a new technology, they have to take the time to learn about it and they have to sincerely try it. So consumer perception regarding the benefits of the new technology and its ease of use are one of the main determinants of IT adoption in the Indian retail firms. The technology must be capable of customer profiling, automated cross selling, demand forecasting, order tracking, customer complaint management and help desk management, then the technology innovation is a big hit within the consumers.

<table>
<thead>
<tr>
<th>Table 2: Percentage of Important Factors</th>
<th>*Percentage</th>
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<tbody>
<tr>
<td><strong>Technology Context</strong></td>
<td></td>
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<tr>
<td>Value Proposition</td>
<td>20.7</td>
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<tr>
<td>Technology Competence</td>
<td>17.2</td>
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<tr>
<td><strong>Organizational Context</strong></td>
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<tr>
<td>Firm Scope</td>
<td>29.6</td>
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<tr>
<td><strong>Environment Context</strong></td>
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<tr>
<td>Location of Operation</td>
<td>25.6</td>
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<tr>
<td><strong>Consumer Context</strong></td>
<td></td>
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<tr>
<td>Consumer Perceptions</td>
<td>38.4</td>
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<tr>
<td>Customer Centricity</td>
<td>31.3</td>
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</table>

*Base=117(total usable questionnaires)
7. Limitation and Future Research

More specifically, it has been shown that consumer perceptions and customer centricity when coupled with higher value proposition of the technology being adopted have the greatest influence on Internet adoption. Such insights are of particular importance at this period of time when many organizations are making the transition from a relatively limited to a more extensive web presence. While the findings will be of most significance to those organizations operating within the Indian retail sector, it is likely that they will also be of interest to companies in other countries that have still to establish a significant web presence.

Given the rapid rate at which e-commerce is gaining importance in today's business environment, the findings in this study are expected to provide helpful guidelines to practitioners and researchers. Although TOEC model will prove to be a workable model for examining IT adoption in the retail firm it is necessary, however, for the purpose of defining more specific drivers of technology adoption, this model could be extended by incorporating additional factors in our framework. However, we are confident that we have given an overview of the most relevant factors in this context. The results of the survey are limited by the sample size that responded to the survey as the data was gathered from university students rather than from the retail firms. Further research from a wider range of retail firms would have given even better sample for generalization. The study is preliminary and needs to be refined and verified further. The items that measure the IT adoption may need to be worded differently until more studies are conducted to verify the findings of this study, practitioners are advised to apply these findings with caution. In particular, it is important that similar studies are conducted in a range of sectors, within a variety of countries to identify areas of commonality and variation, in terms of the factors influencing Internet adoption.
References


