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From the Chief Author's Desk

The research activities among different disciplines of natural science are backbone of system. The deep and strong affords are the demands of today. Sincere afford must be exposed worldwide. Which, in turns, require international platform for rapid and proper communication among similar and interdisciplinary research groups.

The Global Journal of Management and Business Research is to fulfill all such demands and requirements, and functions also as an international platform. Of course, the publication of research work must be reviewed to establish its authenticity. This helps to promote research activity also. We know, great scientific research have been worked out by philosopher seeking to verify quite erroneous theories about the nature of things.

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Packing Repositioning As A Differential Strategy On Spiritual Beverages Market Management: Ron Montilla Case In Brazilian Marke

Nadia Kassouf Pizzinatto 1 Trajano Leme Filho2 José Edson Moysés Filho3

Abstract- **This paper investigates the repositioning of package as a differential strategy on products managements, specifically on market of beverages called spirituals. It approaches a case involving Ron Montilla, a 50 years market product, with strong brazilian domestic market share segment. The study reveals how Positioning Product theory is applied to corporate activities, in order to maintain the product as a market main share on a long-term strategy. This is a descriptive paper, which uses a Case Study Methodology, analyzing the repositioning of the product from 1957 to 2005. As results, exploratory studies like this can be help the construction of the hypothesis, about the repositioning of the packing and how high it is considered as a critical factor on customer decision on products management.**

Keywords- Marketing of Spiritual Beverages; Positioning and Repositioning; Packing; Differentiation; Products Management; Spiritual Beverages.

I.   INTRODUCTION

The spiritual beverages market involves distilleds, classified in specific categories, such as whisky, sugar cane drinks, brandies, liquors, vodkas and runs. This market, faces the competition problems: similar products, substitutive products, trends of new companies introducing, dependence of small suppliers group.

In this scene, it assumes critical role of success the positioning, that can be used as strategy of differentiation in the Management of Products. The term "positioning" was considered by Mintzberg (2000) as one of ten strategy thoughts, it was also subject of an entire book written by Ries, Trout (1987) used by publicity and advertising areas. Currently it is defined by Hooley, Saunders, Piercy (2005) as "competitive positioning". According to the authors, "it is statement of target markets, it means where the company is going to be inserted as market competitor, and its differential advantage; or how the company is going to compete" (underscored ours).

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Positioning can be used as a strategy. The term strategy for Bateman, Snell (2007) represents "a standard of actions and resources destination to reach the goals of the organization". The differentiation strategy can be used specifically in Products Management, which is defined by Hitt, Ireland, Hoskisson (p.155, 2002) as "an integrated set of actions to produce or to supply to good or services that, in the perception of the customer, present important differences for him".

These actions involve to adequate the product pack, in order to create a product positioning view on customer's mind. It means anyway the way a company positions its image, brand or product in the market, it can be strategy do evidence products advantage compared to other competitors. Also involves adequate the product pack.

Presas (2007) reports the importance of the packing in this context: "the packs were able to replace the salesmen, through its design and informations, it made possible the self-service". The author also affirms:

[...] as consumption actions occurring directly in the sales place, the need of instantly identicable products became imperative. The packing turned into a publicity tool, transmitting a set of values in costumer mind, through images. This primordial moment, where the identification of the product occurs by its wrap or recipient, is considered as one of the visual communication main theory, still currently as the most efficient way for identificates and adds personality to a product.

Recent marketing literatures highlights the power of packing in the current sales system, it is associated to traditional function of the salesman:

Since the diffusion of self-service in several sectors, packing was considered as a very valuable function for products sale. It is the silent companies salesman. The costumer finds several variety of brands and his final decision, will be mainly influenced by products pack. (ALBUQUERQUE , 2007).

There is no doubt that packs shall correspond to the image idealized by costumers, by its positioning, and also can be used a competitive advantage in Products Management, through a strategy of differentiation. Companies also use packs to achieve customers share of mind, with differentials as design, durability, cost, and also its ecological procedures.

This paper case is inserted in this scene, where it was investigated a repositioning of Ron Montilla packagings, from 1957 to 2005, as a strategy of differentiation in

products management approaching spiritual beverages market.

II. BACKGROUND

A. Packing In Products Management

The word "pack" refers to packaging, bundling of products, with its wrapping or container. However, according to Moura and Banzato (1997) the packs concept turned more complex, which can have several means, mainly after Word War II:[...] for a consumer it is a way to satisfy consumption desire; for marketing it is a way to attract the consumer and sell the product; for the designer it is a way to protect the product until its consumption, guaranteeing its appearance and conservation; to industrial engineer it is a way to protect products during its movimentation, transport and storage.

According to Cobra (1992), the main functions performed by packaging in the means of this complex conception are:

1 – Positioning the product: to position the product on sales place or consuming public may be a differential factor in strategic marketing terms. The visual aspects and shapes can better position a product on its market segments and even help to find new market niches and opportunities unexplored.

 2 – Facilitating the use of the product: the increasing use of disposable packing for beverages (cans, plastic and glass), shaving blades and another products, proves the importance that the packaging has facilitated the use of the product. Effectively, the packing should always be appropriated to the type of products use.

3 – Helping to sell the product: many of impulse purchases can be attributed to packing. The stimulus is visual, and here comes the role of packaging: attract attention through a good design, combinations of colors, patterns, formats, styles and illustrations.

Barbosa, Dias (2005) believe that it is still not possible easly set which is the importance degree companies attribute to packaging. However they believe that pack is a valuable marketing tool that propitiates all size companies introduction. The pack is their only marketing tool to comunicate with the costumer. Attractive and functional packs are able to influence the customer on sales place.

As the authors above cited, Olivera et al. (2003) affirm that the packaging became a powerful marketing tool and if it is well drawn, can add convenience and promotional values. In terms of Product Management research and considering the convenience and "power" of packaging, Campos & Nantes (2003) concluded that companies realized in a competitive market, it is not enough maintain products characterizes (as taste, color and fresh). The packaging concept expanded, turning into a product status, able to communicate with the same convenience language wherever it located.

Pinho (2002) also orients that the pack shall attend need conditions, to accomplish with its marketing function: to be an advertisement, to attract costumer attention, to be highlighted on sales place, to identify quickly the product, divulgate efficiently the brand, to have a clean and hygienic aspect, to be easy to handle, provide credibility e to add value to the product. The author also affirms that the primordial components of a pack are the label and design. The label usually is a target, with specific legislation, and accomplish with several function such as: brand identification by product name, type product classification, description of how, where and when, it was manufactured, its contain, how shall be used, and promotion through an attractive appearance. The design, how the concept of industrial drawn, means the planning e correct setting of the containers production, that search acceptation and utilization by the consumer, with priority of practical solutions of format, size and quantity of product inside.

 For Mestriner (2004), the main attribute of the pack is related to marketing be a battle for perception and not products, it is able to aggregate new means and values to the product. So the packaging role involves the product role, of industry and marketing, the design has the responsibility to transmite everything costumer do not see, but represents a great productive effort to set in the shelves what modern industrial society can better offer. Under the marketing point of view, the author considers that marketing, in Products Management, shall involve:

1. Characterizes and size of the market segment where product is inserted

2. Characteristics of competitors and their participation in the segment.

 3. Distribution and exposition the product with the characteristics of the channel chosen;

4. Target public and costumer behavior related to this product category;

 5. Manufacturing companies image to the transmitted by the product, with the approval of the brand;

6. Visual communication of the category, which the product belongs to.

 Ottoni (1995) reminds the importance of the packaging during products planning that must attend the following aspects:

1. *Design* - it involves the set of apearance, description of main product components. The author proposes that it shall choose a design with personalized shapes, which guarantee competitive advantage.

2. Packaging – the author recommends to research ways to turn the design attractive: format, text type, illustrations and other aspects, according to the impression it is desire to present for the target public, financial availability, remittance agility, handle etc.

3. Pricing –   it is a product attribute that shall be related to its quality, to client benefits levels, the financial availability of the customer, and the importance that the product offered represents in the market, the way to instigate market to consume.

4. Brand- the name of the product shall be associated to the image that is desire to transmit, what is done through the Positioning.

5. Under this point of view, Sarmento (2006) affirm that to each product there is a correspondent positioning and specific brand. The author reminds

that the brands may change according to its power and market value, for this there are some scales:

1. Brands that are not known by the majority of consumers;
2. Good level of brand knowledge;
3. High degree of brand acceptance;
4. High degree of brand preference;
5. High degree of brand loyalty.

The brand patrimony is directly related to the types of brand, with its recognition, with the quality perceived of the brand, with strong emotional and mental associations, and with other attributes such as patents and channels relationship.

For companies, which own high brand patrimony, there are many competitive advantages, just like:

1. Decrease of marketing costs, due to customer loyalty to another brand;
2. Higher bargain power with the distributors and retailers, because consumers expect them to have the brand;
3. Can charge a price higher than competitors, because the brand has more perceived quality;
4. As the brand has high credibility, it is easier to launch new product lines.
5. As the brand has a value customer perception, it is possible to charge higher price than the competitor.

A branding has to be well managed to do not allow the depreciation of its patrimonial value, so it is necessary a continuous work to maintain and improve the knowledge about of the brand, its quality, functionally e positive association according to customer perception. This work demands continuous investments in research and development, excellent publicity and attendance to retailer and final customer. All strong brands are supported by a loyal customers group. It means that the customer value is quite relevant to sustain the brand patrimony and increasing this value is the most appropriate activity of the marketing planning.

B. *Differentiation Strategy And Strategic Marketing*

For Valdés (2003) the role of Strategic Marketing is guide the companies to market opportunities selected according to company resources, abilities, and have potential for developing and profitability, searching the following basic goals:

1. Identify strategic options, which are consistent and clearly defined;
2. Create systems to monitorate the environment and competence;
3. Strengthen the capacity of the company to adapt to environment changes;
4. Foresee the renewal company product portfolio.

For each circumstances, product type and/or market type, there are strategies more or less appropriated, according to the opportunities or trends identified.

For highly competitive markets, considering current circumstances, the differentiation strategy is an interesting

marketing option, because it can be performed by many ways. Bateman, Snell (2007, p.555), for example identify the possibility for companies use it and apply it to adopt structural and technological innovations, defining it as the "Strategy adopted by an organization to acquire competitive advantage, as the only one in its activities sector or market segment, in one or more dimensions."

However Kotler (2000, p.310) identifies it in differences that may occur in services market, personal, distribution channels chosen, in products image and its attributes, suc as packaging. The author himself questions it: "which differences" should be promoted? Bateman, Snell (2007, p.555) answer that the "most efficient strategy is the one the competitors are not able to imitate. If company strategic plan is easily adopted by other organizations in the same sector, it means the plan is not enough differentiated, or in long-term do not highly contributes to its competitive.

C. *Positioning And Repositioning*

According to Kotler, (2000, p.322), Ries & Trout made popular the term "positioning", however considers them as authors who "deal essentially with communication strategies for positioning or repositioning of a brand on customers mind". For them the: "positioning begins with a product, a merchandise, a service, a company, an institution or even for a person. But positioning it what you do with the potential customer". Hooley, Saunders, Piercy (2005), assume the concept of all Ries, Trout, and add that in definition of the positioning there is a search to understand how customers compare alternative offers in the market, and that build strategies which describes to the customers how company offers are different in relevant approaches from the current or potential competitor offers. They refer to competitive positioning, that with the market segmentation is important to develop the effective marketing strategies.

They also affirm that a company competitive positioning, is a statement: a) target markets (where company is going to compete), and b) differential advantage (how the company is going to compete). (idem, p.35)

Otherwise as defines Kotler (2000, p.321), "Positioning is an act to develop the company offer and image, to occupate a highlighted position on target customers mind"

Actually the target customers compares the alternative offers in the market, based in personal values set: there are consumers who appreciate sports, others give priority to environment respect, other, the support to social causes, other, the culture, and the, positioning and company or product image for these segments receive, respectively the denominations of Sports Marketing, Green Marketing, Social Marketing, Cultural Marketing (Churchill, Peter, 2000).

When the intention is to transmit a product image to the final customer, it is occurring a Repositioning, what can also happen through packaging changes, in order to transmit new ideas about the product to the customer, so turning it differently from market competitors.

III.   CASE STUDY: RON MONTILLA PRODUCT

A.   Methodology

This paper adopted as investigation method the Action Research, developing a study case (Yin, 2001) based on secondary data research, also analyzing internal studies of the Pernod Ricard organization. One of this paper authors, gave relevant data contribution, since he worked in the analyzed company. For Triviños (1998, p. 133-134), the case study is one of most relevant types of qualitative research, whose goal is to deeply analyze a case chosen organization. The method is recognized by authors like Yin (2001), Gil (2002), Mattar (2001), in development of exploratory studies, it is considered as adequate to investigate a contemporary phenomenon inside a real context, where the limits between the phenomenon and not the context are clearly identified (YIN, 2001 apud GIL, 2002, p. 54).

Diehl, Tatim (2004, p.53) in supplement, asseverate that exploratory studies may provide a powerful intimacy with the issue, intent the become its more clear or to build hypothesis, like:

Which kind of packing reformulate produce more effect to the organizations (label, color, format etc.)?

How long time after the packing reformulation the profitability effects are apprehending by the companies?

Which is the right moment to begin a process of packing reformulate?

It is possible to check that the research method most adequate to the execution of this work is the inductive method, because is a specific exploratory study case, in a particular company and taking an exclusive product as target. According to Severino (2000, p.192) "the induction or thought that the antecedent are data or personal facts, the resultant is an affirmation more universal".

To realize a case study with quality, information in primary source (Pernod Ricard web site and employees interviews) and secondary source (magazines web sites about the alcoholic beverages market, that informed the news about the new packing of the product) were collected. So, the requirement of Cobra (1997, p.114), that talks about the information search, were in attendance:

There are two kinds of secondary data: external sources and internal sources. The internal data are maintained inside the own company, and the external data came from other organizations, overcoat public and publication ready for use in the market.

B.   The Montilla Brand

The Ron Montilla is a leader on runs market in Brazil, it owns 72,4% national market share and 93% in northeast regional market, according to a national research institute: AC Nielsen (2005). Since 2000 more than 2 million boxes were sold, it is a consecrated product, celebrating its anniversary gold with 50 production years.

During this period, since 1957, the product renewed its appearance to the consumer seven times: 1966, 1975, 1985, 1995, 1998, 2000 and 2005.

C.   History Brand Montilla And The Company Pernod Ricard

The Ron Montilla was launched in Brazil in 1957 by Medelin distillery, company created around 1918 in Campina Grande city, state of Paraíba.

The goal was create a beverage from an abundant raw material in the region: the sugar cane. The process of the production, with 38% graduation alcohol, includes condensed sugar cane, with the alcohol of sugar cane and the remain liquid is fermented, for a short time in order to produce clear run, for a long time to produce darker run. Finally artificial aromas are added to produce different product lines. The Ron Montilla, currently use this process for the line Montilla Tropical Limão.

During its launching the distillery Medelin adopted a round bottle, similar to a traditional beer bottle (see attachment B – Evolution of Ron Montilla Packs). It was the cheaper way to launch the product, without visual concerns, which made no sense at that time. In the label there was a pirate with a parrot in his shoulder, this icon used until now in order to highlight the free and adventure profile (see attachment A- The Ron Montilla parrot). The parrot picture was created to better characterise the pirate, during brand first years.

Gomes (2005), a graphic designer professor at the Federal Center of Technology in Rio de Janeiro, reports in article his characters and brands, the strength of label and pack form attributes in products, and how they remarks customers mind:

There are characters that are created exclusively to actuate with a brand, without, however, being part of it (character-product). It is the case of the scene of the pirate with the parrot, that from decades repeats in each bottle of famous Ron Montilla.

In 1966, the canadian company Seagram, launched in 1857, bought the Medelin distillery in Brazil, assuming its products portfolio, including the Ron Montilla. As soon as Seagram assumed the new company, reformulated for the first time the pack of Montilla (see attachment B – Evolution of Ron Montilla packs).

Until 2001 when Seagram was buyed by a french Pernod Ricard, owner of global famous marks marcas, such as whisky Chivas Regal and e vodka Wyborowa, the Ron Montilla went through more five pack reformulations. The most innovative ones occured in 1985, when the pirate was removed from the label, In 1995 the pirate came back but without the traditional parrot in his shoulder. It was a strategy to highlight the pirate e decrease costs from collor investments. The consumers first declared that was no the real ron mantilla, some even said the beverage was interely different. Anyway, the lack of communication regarding this change and the costs to its strategy were much higher than just get the parrot back. Only in 2000 the parrot figured again in the product packs. Since this happening nobody does not even suggest this kind of change, facing new risks on market communication and brand positioning concerning the label.

The Pernod Ricard was created in 1975, from a fusion of the companies Maison Pernod Fils (established in 1805) and

Société Paul Ricard (established in 1932). Both produced distillates of anis like Pastis, with the name of the own companies: Pernod e Ricard. With the fusion it was created the Pernod Ricard company, whose profitability was around 5,8 billion Euros (fiscal reference, year 2004/2005), according to data from company web site.

In the decade of 1980 the Montilla reach the historical score of one million boxes sold, and in 1996, 1,5 million boxes sold. Most of the sales profitability were from the northeast of Brazil, so Montilla became a cultural local symbol, sponsoring big São João popular parties.

In 2005 the pack was considered strategic, as part of run a repositioning project, since the company faced strong competition with other beverages with similar price, like Bacardi as well beers which were aggressive searching young people market.

In these circumstances the brand Montilla tried to be reminded for young consumer (from 18 to 24 years old), as an attractive, modern, light, relaxed and with an adventure profile. Although the product had these characteristics since it is launching, they were not represent through the pack.

D. Repositioning Of Montilla Brand

From the beginning of first decade of XXI century, the Pernod Ricard decided to elaborate a project to reposition its product to increase Ron Montilla sales amount, because they were facing strong advertising campaigns of competitors and also substitutive beverages (beers).

As response it was invested 6 millions Euros in an audacious Marketing Plan, divided in four steps. According to O Debate (2005), the first phase covered:

[...] the change in the bottle of the entire line, what included a rounded shaped format, easy to handle and label with bright and cheerful colors. The name Montilla was written in high relief and the pirate, a very known personage became younger, happy and light. The second phase involved the visual identity, it means, the overall renew of Montilla line packaging (Carta Branca, Carta Ouro, Carta Cristal e Tropical Limão), with forms and labels more sophisticated and modern. The following two step were publicity campaigns and events all around the country.

The goal set by Pernod Ricard was increase 18% in sales amount in a year period, also strengthening its presence in northeast and expanding the product presence to other country regions.

This change in the bottle shape, high lightening the contour lines, making easier the handle by the costumers and using lighter colors, is in accordance with some primordial packaging functions, described by Cobra (1992):

1 – Positionate the product: the new visual of Ron Montilla confers prominence to it compared to the competitors, that maintain the traditional round shaped bottles, without any marketing action, any new message to transmit to the customers.

2 – Facilitate the use of the product: the increasing use of disposable packs for beverages (can, plastic and glass) blades to shave and other products, prove the importance of packaging as facilitator of product use. Effectively the brand should be always adequate to the type of product use.

3 – Help to sell the product: with the new pack, the Ron Montilla won power in convenience purchase. Its visual appeal attracts the customers attention and transmits the idea of newness.

Besides Montilla packaging recasting, the Pernod Ricard also innovated to create a new product in this continuous expanding market: the RTD (Ready to Drink). It is the Montilla Cola: an aluminiun cane with white run and cola extract, with low alcohol degree: only 5,5% (see attachment C – Ron Montilla Cola).

The period chosen for the launching was the São João parties in 2006, in Brazil northeast, and the investment was 800 thousand Euros. This innovation goal was create a modern version of Cuba Libre, using the strength and respectability that the brand Montilla as in this region. With this action the Pernod Ricard started to compete in the RTD segment, where Smirnoff was already inserted with their Smirnoff Ice version, without competitors concerns.

E. The Creation Of Montilla 50 Years: A Commemorative Product

In 2007 the brand Montilla commemorates 50 years. Not only to celebrate, but mostly to solidificate the presence and the strength of the product in brazilian market, the Pernod Ricard made the biggest investment of its history: 8 millions Euros (MAXPRESS NET, 2007).

An audacious marketing plan was elaborated with the subject: "Live! The Golden Pirate is You". It was made a new pack, specific for the commemorative product. (see attachment D – Ron Montilla Gold). This pack has a different format from the regular line, however keeping the modern round shaped. In the bottom of the bottle there were three blazons indicating the Pirate ship, the icon of the product success. The label owns black and gold as main colors, referring to the 50 year.

Besides it was developed actions in sales points in retail and wholesale, new web site, sponsoring traditional carnival and São João events, bringing celebrities and a special commemorative 50 years seal, with the golden as predominant color, referring to Montilla gold anniversary, and interacting with the traditional brand orange.

However not only the pack were improved: the run itself is only for commemorations and it was baptized the Montilla Premium, developed through customers researches, and elaborated with runs aged of 3 up to 18 and coloration ambar.

The main objective of Pernod Ricard with the Montilla Premium, is keep its comfortable position of 72,4% national market share and 90,3% in the northeast region, revealing the importance of the study if customer behavior, of the continuous analysis of product acceptance in the market, and assertive actions to reposition and reformulate the packaging that make the products different and remarkable to the customers mind.

IV. FINAL CONSIDERATIONS

The concepts and arguments of the literature consulted allowed evidencing the importance of packaging to the product position for its target public. The image to be

transmitted by the product, with the accordance of brand, owns the visual communication that the company wants to transmit to the customers. So it is not enough to have product quality if the nearest communication, the pack, does not transmit it. The Ron Montilla and its pack with the personagem, are probably inseparable for market identify them.

A good pack aggregates value e improves the competitive capacity of the products, compared to all competitors. Companies who are in the market leadership, like the Pernod Ricard, try to build strategies that describe to the customers the products advantages. Also the packaging has a decisive term in the competitive positioning, in the product segmentation.

The importance of the pack in products management and planning, reported previously by Ottoni (1995) as a set of recommendations to create attractive forms, is directly connected with the organizational activities in the case of Ron Montilla: form, bottle color for different products line (transmitting the idea of getting older for the darker bottle, and lightness for the bottle of Tropical Limão), living illustration in the labels that transmit the message of adventure, and create the positive desired positive impact in the target market, also facilitating the implementation of repositioning product strategy.

The daily organizations activities take the theory as master line in this case study. Since the strategy proposed by repositioning of Ron Montilla, it became harder any benchmarking competitors action. The form of the pack, its colors, and attachments, are in separated, connected to the product history and message. This is a competitive advantage in Products Management, presented previously by Bateman, Snell (2007, p.555), that affirm "the most efficient strategy is the one the competitors are not able nor intent to imitate". Comparing the academic studies previously presented by Hooley, Saunders, Piercy (2005), the Pernod Ricard could kept itself positioned in a competitive manner, with the pack as differential advantage and strenghing its share in target markets.

Related to target markets, the pack needs to be associated to the status product shall offer to its customers. The pack design, form, colors, label, the entire set of components which compose the "packaging set", are projected to remark the product in the mind of the customers in its segment actuation. For example french cognac bottles that may cost 330 Euros are directed to a specific public.

The public of Ron Montilla is young people from classes B and C. According to this strategy, the presentation of the products tries to combine the use of colors, form counters softly round shaped, transmitting essentially four types of image: 1) a modern product 2) a product that goes with any drink elaborated from run, like Piña Colada, 3) a top line product for a standard B and C consumption (the classic runs for class A are imported brands, like Havana Club or Bacardi) and 4) a product with a pack elaborated no inhibit the consumption by D and E classes, by transmitting a superior social status.

However the strategy may not be works, since the adversiting was supposed to increase the use of the ron with other products, resulting drinks as *piña colada* for example. For those who consume ron this way, the brand, label and pack theoretically would not have such importance. In order to understand these details, it is interesting to analyse the ron consumption in Brazil. About 85% is consumed with other drinks, only 15% is consumed pure. From the amount used in drinks, almost all volume is destined to prepare the a popular drink named *cubra libre.* Since the bars (sells point) are awared the ron mantilla pricing, positioning and reduced number of players – market is shared between Bacardi and Pernod - they use the cheaper beverage or the one available in his place; they also may choose the exclusivity policy.

Traditional brazilian drinks do not take ron, so mixed drinks as Mojito, Piña Colada and others, are prepared in selected bars, such as cubains (Azucar, Rei Castro) in São Paulo. In these places the pack is not important, but the brand is. The restaurants elaborate their drinks with Ron Montilla and associate this brand to the drink name, as Havana Club. Sometimes the consumers demand specifically the brand to prepare the drink, since they know beverages and have drinking as a habit. Company has database indicating that less than 3% of ron comsuption is made through mixed drinks.

Considering all premissas, it is concluded that in general the brand of a product has been considerate an indicative of commercial differential. So it is demonstrated the relevant contribution of the brand Ron Montilla for the marketing consolidation strategy and repositioning the product in the market, becoming perhaps the status of most remarkable Pernod Ricard product.

This study may be continuated with the verification through a descriptive study of the customer, the most important part of the commercial transactions, also his behavior in relation to the new pack. It also can be continuated with researches that bring known the degree of brand recognition and the quality perceived of the brand, any other mental emotional associations of final consumer, and also study the assumptions researched about customer behavior and his drinking preferences home.

The understanding of purchase and consuption behavior can be characterizaded as another way to be explored, that will provide more advanced researches to understand the evolutions and adaptations the alimentar habits can pass through and the relations that the pack can offer in final consumer perception.

It is also relevant to remind the social habits of spiritual beverages (runs and vodkas, for example), because these products are consumed, mainly by a group of people, with another ingredients, resulting in colored, aromatic, delicious drinks. That reveals the importance of an elaborated pack, that can the remarked in consumer mind. This study provided a small contribution for future researches about products positioning through the use of pack as a differential strategy in spiritual market beverages.

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I.   Attachments

A.   Attachment *A – The Pirate Of Ron Montilla.*

FIGURE 1 – The pirate of Ron Montilla.
Source: Pernod Ricard.

B.   ATTACHMENT B – Evolution of Ron Montilla packs.

FIGURE 2 – Evolution of Ron Montilla Packs.
Source: Pernod Ricard.

C.   Attachment C – Ron Montilla Cola

FIGURE 3 – Ron Montilla Cola.
Source: Pernod Ricard.

D.   Attachment D – Ron Montilla Gold.

FIGURE 4 –Ron Montilla Gold.
Source: Pernod Ricard.

An Assessment Of Ethiopian Telecom Customer Satisfaction

Dr. Rajasekhara Mouly Potluri[1] Mangnale V. S[2]

Abstract- **The primary purpose of this research article was to explore Ethiopian telecom customer satisfaction levels. To attain this objective questionnaire was designed and distributed to 400 customers in Addis Ababa region and were asked regarding the customer service delivery of sole telecom service provider of the country Ethiopian Telecommunications Corporation (ETC). Through structured questionnaire and in-depth personal interviews with 400 Ethiopian telecom customers of both the sexes (252 male and 148 female) in and around Addis Ababa region collected the opinions on service interaction, service delivery process, customer complaint handling procedure, overall satisfaction levels and also customers opinion on improvement on telecom service providers ability in the last five years.   This study used both quantitative as well qualitative survey research designs. The study measured customer satisfaction levels with recalled service encounters and the method of data collection was convenience type. The data collected was analyzed with the help of SPSS 15.0 and Microsoft Excel software packages. The findings of the analysis showed that 41% customers of ETC were dissatisfied with employees' interaction skills. Furthermore another 47% of the customers were also disappointed with customer service delivery system and 70% customers were not pleased with the Complaint Handling Procedure and its outcome. And 57% of the customers expressed overall dissatisfaction on the services provided by ETC. Furthermore 90% respondents robustly acknowledged ETC is improving tremendously in providing all kinds of services in the last five years.**
Keywords:Customer Satisfaction   Ethiopian Tele Service EncounterService Delivery Process   Complaint Handling Procedure

I.   INTRODUCTION

Marketing is one of the liveliest fields within the management field.   The market place continually throws out fresh challenges, and companies must respond. It is not surprising that new marketing ideas keep budding to meet the new marketplace challenges. Marketing theory and practice developed initially in connection with physical l products such as toothpastes, cars and steel. Yet one of the major mega trends has been the phenomenal growth of service. A service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything

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(Kotler and Keller, 2006). The perception of service marketing focuses on selling the services in the best interest of users/customers. It is concerned with a scientific and planned management of services which makes possible a fair synchronization of the interests of providers as well as the users. Services are important segment of all economies and they become increasingly more everyday life as economies develop. The size of service sector is increasing in all economies around the world.

The introduction of telecommunication services in Ethiopia dates back to 1884, seventeen years after the invention of telephone technology in the world. It was Minilik II, the King of Ethiopia, who introduced telephone technology to the country around 1884, with the installation of 477km. long telephone and telegram lines from Harar to Addis Ababa. Ethiopian Telecommunications Corporation (ETC) is the oldest public telecommunications operator (PTO) in Africa. It is a state owned enterprise and the sole telecom service provider in the country. The telecommunication services in Ethiopia have made rapid stride both in quality and quantity.   However, the user at large are found dissatisfied with quality and quantity of the services made available to them.   The process of technological sophistication has gained the momentum but the users are yet to get the quality and quantity of *service (Tele Negarit, 2007).*

This is an exciting time for telecommunications development, since new technologies are revolutionizing the services worldwide. These fundamental and rapid changes being experienced by telecommunication markets throughout the world are brought about among other factors primarily by the technological developments and by competition oriented reform policies. This creates different expectation on customers' perception towards the product or service of the company.   In these days globalize and borderless market, responsiveness, quality and productivity are essential for the survival and growth of any organization. These factors depend mainly on the attraction and retention of customers.   Customer satisfaction significantly affects company performance and survival.   Thus customer orientation is the main focus for any successful business organization to be successful in the market place.   In recognition of the huge challenges created by the increasing requirement for a modern telecommunications services by its customers and in response to the civil service reform program of the nation, ETC is commissioning a system overhaul.

In this research study, the focal points were to identify the real problems of customer dissatisfaction in ETC service delivery from the customers' point of view.   This study

investigated how customers evaluate the service delivery process of ETC by recalling the past six month's interaction with ETC in the process of service delivery. This research also tried to identify the interaction frustrations with the ETC frontline employees.

ETC provides national and international telecommunications services, using communication media of satellite, optical fiber, microwave, multiple access radius, very small aperture, ultra high frequency and very high frequency. Currently, it provides the following major types of service packages such as landline and wireless fixed, mobile, internet and data services for its government, business, and private and other non-government organizations which are locally and internationally. The researcher considered all categories of subscribers in order to get information regarding their evaluation of ETC service delivery and to identify the major area of dissatisfaction in service delivery activity from the point view of customers.

Unfortunately no service is ideal all of the time. During the service encounter there are a variety of things that can go wrong.   Since the service provisions need real time performance, customer involvement, and people as part of the product greatly increase the chance of service failure. Service failures can be due to unprompted employee actions (e.g. rudeness), failure to respond to specific customer needs or preferences, or core service failures, e.g. unavailable or unreasonably slow service *(Bitner, 1990)*. These service failures can vary in severity, frequency, and timing, resulting in dissatisfied customers *(Kelly and Davis, 1994)*. Many companies have recognized their customers are valuable assets and take steps to ensure that when service failures do occur, there are processes in place to respond quickly. Service recovery consists of those actions a service provider takes in response to a service failure *(Gronroos, 1988)*. *Zemke and Bell (1990)* note that a good service recovery enhances customers' perceptions of the firm's competence, the services already purchased, and the value of the organization's other offerings. As such, converting dissatisfied consumers to satisfied (i.e. recovered) customers is an important objective for most companies. Particularly, in competitive environment the types of service recovery strategies companies are using directly impact organizational profitability and future successes. Although the actual performance of services takes place in service encounters at an operational level, services management is crucial to the overall strategic and tactical management of business operations. Services have many typical features: These include the following: service are ephemeral and heterogeneous; their production, distribution, and consumption are simultaneous processes; they are essentially activities or processes; they represent a core value that is created in buyer-seller interactions; customers participate in their production; they cannot be kept in stock; many services are difficult for customers to evaluate; the time factor assumes greater importance; and there is no transfer of ownership.   These characteristics reflect the essentially interactive nature of service encounters-that is, services are produced, distributed, and consumed in the

interaction between the service provider and the service receiver.

The above mentioned characteristics of service are common in telecommunications service. Even though, there are tangible physical product associated to provide service such as customer premise equipment and cable, the major product is intangible in nature and the production and consumption of the final product take place simultaneously. These characteristics reflect the essentially interactive nature of service encounters-that is, telecommunication services are produced, distributed, and consumed in the interaction between the service provider and the service receiver. The extent of customer interaction to service provider varies among service provider. Many service provider most of their activities are automated so that there is less contact to front desk personnel, however, in those companies which do not automate their service provision there is high chance of interaction between service personnel and customers. In the case of ETC, there is high degree of person-to-person interaction between front desk employees and customers.

Service Interaction: Interactions or Encounters between customers and employees are a critical component of service quality. This is especially true for services characterized by a high degree of person-to-person interaction and by the absence of an exchange of tangible goods. The client comes away from service interaction with feelings of satisfaction or frustration.   Service encounter is an interpersonal association between the firm's staff and customers. Some service encounters are very brief and consists of just a few discrete delivery steps, however, other may extend over a long time frame and involve multiple steps. Therefore, the service encounter often begins with submitting applications requesting service and placing an order. Contact may take personal exchange between customers and service employees or impersonal interaction with machine or computer. It is difficult to improve service quality and productivity without full understanding of customer's involvement in a given service environment. This study defines the service encounter as the entire exchange between customer and service provider from the initial contact through conclusion of the exchange.

Service Delivery Process: Processes are the architecture of services, describing the method and sequence in which service operating systems work and how they link together to create the service experiences and outcomes that customers will value. In high-contact services, customers themselves become an integral part of the operation. Badly designed processes, often result in slow, frustrating, and poor-quality service delivery and are likely to annoy customers. Similarly, poor processes make it difficult for frontline staff to do their jobs well, result in low productivity, and increase the risk of service failures. *(Lovelock and Wirtz, 2004)*.   Organizations which are involved in high-contact, people-processing service sector should design highly convenient process blueprint for both frontline staff as well customers. This process blueprint should clearly prescribes the sequence of actions while service delivery. After completion of this kind of blueprint process document, organization's middle level management

should have the responsibility to oversee the service encounter stage just to know the process is implementing according to blueprint or not. If any discrepancy they have observed, they should correct it then and there itself. In the mean time organization's think tank should identify where things are particularly at risk of going wrong. From a customer perspective, the most serious fail points should be better to identify and address them with utmost care. Service delivery to customers involves decisions about where, when, and how. At the time of service delivery, there is also the possibility of delays between specific proceedings, requiring the customers to wait. Very frequently, management should identify that kind of locations and better to control the operations which are leading to delays in service delivery. Through both continuous official research and on-the-job experience, service managers can find out the nature of customer expectations at every stage of service encounter. And bring in required modification in the existing service delivery process to increase customer satisfaction. If any service firm failed to identify the loopholes in their service delivery process, it is an uphill task for them to retain the customers even though the firm is planning to introduce service recovery as a healing strategy.

Failure to ensure customer satisfaction, both initially and belatedly, through service recovery could lead to a decline in customer confidence, lost customers, negative word-of-mouth, possible negative publicity and the direct cost of re-performing the service *(Berry and Parasuraman, 1992)*. In essence, the service firm's true test of commitment to service quality and customer satisfaction depends on how it responds after disconfirmation *(Zemke and Bell, 1990)*. Effective managerial responses depend, however, on effective research of the phenomenon. Unfortunately, several limitations in consumer complaint behavior research have been noted.

The explanation above suggested that the importance to firms of ensuring that if something goes wrong, then there is a mechanism in place to recover it. Of greatest importance in the service recovery process is the assurance that customers have a dedicated means by which they can express their dissatisfaction. A range of techniques must be used to ensure customers have adequate means by which they can register their views. "Self-completion questionnaires" are the most commonly used of these as they are able to identify all potential problems. They may also be completed once the service has been received, either immediately or at a later date. However, if the latter option is taken and a complaint is registered, there is little an organization can do to recover the situation. Therefore a more customer-focused approach is required. Rather than to depend on the service recovery system, its better to concentrate more on curbing the minus points in the service delivery process based on old proverb "prevention is better than cure".

To ensure customers are satisfied, staff members can be selected to walk around the service area checking that all needs are being properly met. This ensures that customers can voice their dissatisfaction in an environment where the

situation may be considered and rectified. It is here that a professional and efficient service recovery process operates. Successful service recovery strategies can restore customer satisfaction and can also influence other important organizational outcomes including loyalty, positive and negative word of mouth behavior, and profitability. Poorly executed service recovery tends to exacerbate customer dissatisfaction, may drive customers to competing firms and, at the very least, encourages customers to badmouth the organization.

Customer Complaint Handling Procedure and Its Outcome
Most of the organizations in these days have treated customer handling procedure as a strategic marketing tool. Service providers are frequently exhorted to strive towards a "zero defects" service; the ability to "get it right first time" is thought to offer significant benefits to organizations in terms of both customer evaluations and costs of delivery (Schaefer and Christine, 2005). If any organization is striving for zero defects, they need not give that much importance for complaint handling sections. In practice, it is often difficult to imagine how service providers can attain such a goal, not least because of the inherent heterogeneity in service provision and limitations on the extent to which a provider can control the range of different interactions with customers. In general, customers are complaining with four major ideas like to get compensation, find expression for their anger, and help to improve the service and for unselfish reasons. Service organizations should build up the culture of straightforwardly to invite the complaints with a motive to improve the service and with selfless reasons. And at the same time, organizations should be cautious enough about the complaining nature of some consumers with an intention to demand compensation and spoil company image.

Whatever the reason in the customer mind behind the complaining nature, that is irrelevant to the organization. Their main accountability is to genuinely solve the complaint and be successful in explaining the reasons for that in a convincing way. However service businesses in advance clearly recognize the various reasons behind the complaining nature of the market and should devise special strategies to give a legitimate reason. And another important element in this aspect, organizations has to develop complaint procedure with minimum of fuss. If customers are treating complaint procedure is too lengthy and clumsy, it will also affect the performance of entire organization. Thus, organizations should be very watchfully design the complaint procedure with minimum of paper work. Related to the outcome of the complaints, market has one strong notion i.e. result always in favor of organization whatever the problem, who ever the reason for that. The market is feeling that they are not treated fairly and far away for adequate justice. This kind of belief in the market is more dangerous for any business in the present day's highly cut-throat competitive business world. Therefore, while analyzing the complaints, service firms' complaint handling sections should be more vigilant in finding the legitimate reasons and also the responsibility to provide ample justice to the customers' community. This class of legitimate judgment will give great confidence in the minds of

customers while solving their indisputable problems and in turn increase the image of the firm. Finally, service firms should be better to realize the importance of complaint handling procedure and its outcome and also well again to bring into play this one as a strategic marketing tool to accomplish the benefits such as customer satisfaction, customer loyalty, favorable word-of-mouth publicity, and to decrease litigation.

Customer Satisfaction: The concept of customer satisfaction occupies a central position in marketing thought and practice. Many companies today are aiming for TCS- Total Customer Satisfaction. Satisfaction is a major outcome of marketing activity and serves to link processes culminating in purchase and consumption with post purchase phenomena such as attitude change, repeat purchase and brand loyalty. Satisfaction is defined as a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under-or-over-fulfillment *(Oliver, 1981). According to Tse and Wilton (1988),* satisfaction is the consumer's response to the evaluation of the perceived discrepancy between prior expectations and the actual performance of the product as perceived after its consumption. Attitude also shapes consumer expectations and expectations are, therefore, either positively or negatively inclined. Expectations, according to the disconfirmation paradigm, exert an important influence on customer satisfaction with the service encounter and thus on service quality perceptions *(Bitner, 1990).* Customer satisfaction will occur only through conscious efforts to alter the way the firm's approach to work. Service firms must not only change their attitudes but also change the way they organize their effort. Therefore, organizations must rethink how they do business as customers move from the periphery to center stage, old ways of doing business no longer work. Every company would be wise to measure customer satisfaction regularly because one key to customer retention is customer satisfaction. Understanding what customers expect from a service organization is necessary for service managers, because expectations provide a standard of comparison against which consumers judge an organization's performance. Customers of services have expectations about what they will receive from the delivery system. Undoubtedly, customer satisfaction is the key to survival and thriving in the competitive time is to win the customer and to keep them in our service or product range. Obsession with customer satisfaction is what driving change is today particularly in service sector. Customer satisfaction will occur only through conscious efforts to alter the way we approach our service delivery process. Service companies must not only change their attitudes towards market but also change their way in providing services with market expected parameters like quality, reliability, tangible evidences, responsiveness, assurance, empathy, price, availability, accessibility, etc. Therefore, organizations in general, service firms in particular must rethink how they do business as customers move from the periphery to center stage, old ways of doing business no longer work.

II. Research Methodology

Since 2005, Ethiopian Tele has initiated a corporation wide reform program to overhaul its entire system. To facilitate this reform program the corporation has undertaken Business Process Reengineering to bring radical changes and Quick Win to make incremental change. The main component and the first priority for this program was the reengineering of the customer service delivery at a corporate level. Even though the reform program has been undertaken to curb the customer dissatisfaction, the company records shows that customer complaints are increasing. Since customers are the cornerstone of any organization, therefore, considering the views of customer expectation is a tantamount in service delivery for Ethiopian Tele service provider.

The principal objective of this research is to explore issues related to Ethiopian telecom customers' satisfaction levels from the point view of customers. More specifically, to investigate the causes of customer dissatisfaction across service encounters related to all kinds of telecom services rendered by Ethiopian Telecommunications Corporation. This study used a quantitative survey recall research design to recognize their satisfaction levels and also used personal interview method just to collect the views about the reasons for their dissatisfaction. Structured questionnaire were used for primary data collection. The questionnaires were translated to local language Amharic. Research participants were drawn from existing customers of all services of ETC. The method of data collection was convenience type. The research was conducted in four zonal offices found in Addis Ababa.

The sample frame for this study selected was only the present Ethiopian telecom customers which are living in and around the country's capital Addis Ababa. The sample size was 400 customers, out of which 252 male and 148 female customers who were randomly selected from different telecom services viz. mobile, landline, internet, and data services. Mostly these were selected based on the issues like willingness and the time allotted by the respondents for the collection of information. Data was collected at various areas of Addis Ababa City. Data was analyzed by using both quantitative and qualitative techniques. The analysis was completely done on the basis of data and information collected from four hundred respondents (252 male and 148 female in sex composition) through questionnaires and personal interviews. Statistical analysis techniques frequency was applied to compute percentages and other quantitative data to analyze and interpret the outputs. The analysis was done using frequency distribution and percentages to show which part of the service delivery were more accountable for the dissatisfaction of customers in ETC. Data manipulation was done by using SPSS 15.0 and also Microsoft Excel software packages. The secondary sources of information included data from the company records, library and internet search. This research covered only the customer's service delivery in four Addis Ababa zonal offices (North Addis Ababa, East Addis Ababa, Central Addis Ababa, and South Addis Ababa Zones). It

does not include the point view of ETC employees. This study was unable to include the views of other parts of Ethiopian telecom customers due to time and resource constraints. As far as the research is designed to be undertaken from the point views of customers, therefore, some respondents may probably bias in filling questionnaires.

delivery system. Those who are willing to fill the questionnaire were only approached. The questions which were asked to know the satisfaction levels about employees' interaction, service delivery processes, customer complaint handling procedure and its outcome, overall evaluation of customers' satisfaction and finally about improvement of service quality in the last five years.

III.   FINDINGS AND DISCUSSION

The customers at different parts of the country's capital were asked to fill questionnaires to evaluate ETC service

Table:Analysis of Considered Parameters for Ethiopian Telecom Customer Satisfaction

Considered Parameters	Male		Female		Total	
	Satisfied (%)	Dissatisfied (%)	Satisfied (%)	Dissatisfied (%)	Satisfied (%)	Dissatisfied (%)
1. Service Interaction	53	47	70	30	59	41
2. Service Delivery Process	48	52	60	40	53	47
3. Customer Compliant Handling Procedure and its Outcome	20	80	48	52	30	70
4. Overall Customer satisfaction Level	37	63	54	46	43	57
5. Last 5 Years Service improvement	92	8	89	11	90	10

Service Interaction: Out of 400 respondents, only 41 per cent expressed their dissatisfaction about the interactive expertise of the front desk employees of the Ethiopian Telecom. One important point in this facet, when compared to female customers, male customers were more dissatisfied about the service interaction skills of the sole telecom service provider of Ethiopia. This means the frontline employees were showing clear variation while interacting with the male customers. This should be curbed by the middle level management with careful introduction of change in the minds of front desk people. In our qualitative research, most of the respondents said employees were more mechanical and straight to the point while clearing or giving information about telecom services. Some of the respondents expressed doubts about the product/service knowledge, interactive and problem solving abilities of the frontline employees of the corporation.

Customer Service Delivery Process: Another 47 per cent respondents articulated their displeasure on service delivery process. They were treated the process has lot of complications and clumsy one in the areas of applying, and receiving telecom service, bill payments etc. This means market is expecting certain changes in the service delivery process of Ethiopian telecom. Based on the expectations of

the market, ETC's think tank should be better to study the clumsy parts of the existing service delivery process and if they observe any duplication at any area, it is better to get rid of that kind of activity to save the time and effort of both their employees as well customers.

Customer Complaint Handling Procedure and its Outcome: Significantly 70 per cent of customers uttered their unhappiness about this issue. They were thinking complaint handling procedure was lengthy and time taking, most of the timings the outcome also in favor of service provider. The Ethiopian telecom market was feeling that they were not treated fairly and far away for adequate justice while handling their complaints. This means a serious thinking is required from the top officials on complaint handling procedure and its outcome to regain the confidence among the customers as well to bring in the benefits like customer satisfaction, customer loyalty, and positive publicity and also to minimize litigations.

Overall Satisfaction Level: About 57 per cent respondents conveyed their disappointment on the overall performance of the telecommunications corporation of Ethiopia. This means it should be healthier to identify the areas which led to this kind of dissatisfaction and introduce complete

overhaul to recover the situation. The researcher identified some areas of dissatisfaction particularly service quality, tariff structure, service encounter, service delivery process, bill payment areas, complaint handling procedure, after sales service etc. through his qualitative research. The Ethiopian telecom service provider has already working on above areas which has led to great customer dissatisfaction with the support of overhauling of most of the existing plans, procedures, programs, strategies, policies and even budgets also.

Service Providing Ability: In the entire 400 respondents, 90 percent expressed confident opinion about the improvement of service providing ability of the telecom corporation in the last five years. The majority of the customers even now has treated ETC's services are the voice of Ethiopians. But some respondents opined that the pace of improvement in providing quality telecom service is not sufficient when compared to the speed of improvement in the telecom world. Most of the Ethiopian telecom customers are totally in high spirits with the way the telecom service provider improves its telecom infrastructure, service quality, service recovery strategies for maximizing their customer satisfaction levels.   In their thoughts, Ethiopian Telecommunications Corporations is shining and number one service provider in the entire African continent. Keep it up ETC.

IV. MANAGERIAL IMPLICATION

The current study provides insights to telecom corporation's higher officials about the customer dissatisfaction areas in providing quality telecom services. Because of significant dissatisfaction percentage levels among customers, ETC's think tank need to seriously evaluate its customer service delivery system in the first phase. Particularly, the service delivery processes require more attention from the top officials and it will need to undertake redesigning just speeding up processes and weeding out unnecessary steps to avoid wastage of time and effort of both employees as well customers. And in the second phase, ETC has to concentrate on staffing and training of frontline employees and their interactive marketing skills. Furthermore it is better to introduce complete changes in customer complaint handling system and its outcome by giving clear cut instructions to the concerned sections for legitimate evaluations on customer complaints.   Finally, the corporation is also supposed to assign an overriding priority to the Total Quality Management that focuses on quality technologies, quality employees, quality maintenance, and quality environmental conditions at work to achieve Total Customer Satisfaction.

Conclusion: In view of the above, the boardroom, senior professionals, the marketing and maintenance professionals are required to assign due weightage to the areas of dissatisfaction and introduce radical changes in their existing practices for meeting the telecom needs of the country. Just like world telecom giants, Ethiopian Telecom Corporation also better to make every effort for Total Customer Satisfaction (TCS) by expecting the clear attitudinal changes among the existing customers for retaining them.   For this they have to once again review their existing plans, policies, procedures, programs, strategies, and even budgets for offering confident and market expected telecom services to win the hearts of the 76 million Ethiopian people. All the best to the Africa's oldest telecom service provider: Ethiopian Telecommunications Corporation.

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Indian Retail Revolution- A Research Analysis Carried Out In The Delhi Region

Dr. Vipul Jain

Abstract-The literature on with increasing competition and introduction of newer facilities, the Indian retail market is witnessing a sea change. Both national and international brands are innovating newer service standards, and the customers' needs and demands are getting redefined. Hence, there happens to be a large variation in consumer's buying perception/ behavior across different retail chains in Delhi. An attempt was made to understand the consumer perception about the present Retail Outlets in Delhi, and identify the most preferred one.

The main method used for the collection of data was Exploratory Research and Conclusive Research which consists of secondary research and questionnaire design.

It was realized that there can be various motivational factor that act as a driving force in the preference of retail stores. It was also realized that customer service is the strongest factor for both men and women. Customers of various age group is also a deciding variable in customer services

I. INTRODUCTION

Retailing in India is still in its nascent stage and the pace of growth is still below the desired level. FDI restrictions in multi-brand outlets have not stopped investments from flowing into the sector and Indian entrepreneurs are leaving no stone unturned to give consumers a new shopping experience. However, the departmental stores could not swallow the business of small and medium retailers. Single store retailers continue to grow. Even in the food and grocery segment, supermarkets have sprung up and barring the exit of few shops (which happened earlier too), Everyone seems to be innovating to offer a different level of value to the consumer. Thus, your neighborhood grocer takes orders over the phone, delivers at no extra cost and even passes on discounts on some products.Malls are contributing hugely to the development of organized retail. Retailers on their own have found that investing in real estate in places like Mumbai and New Delhi is an expensive proposition. Malls are coming up both within cities and at the outskirts vowing to create that will attract thousands of customers every day. The next stage in organized retail is to expand but in a coordinated manner. This has made retailers more cautious about their growth plans. National players are expanding their presence in existing regions first before moving on to other cities

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the thinking seems to be that there is more scope for expansion in metros. Only some retailers like Shoppers' Stop, Pantaloons, Westside, Ebony, Globus, Big Bazaar and Lifestyle have reached a stage where they have acquired significant bargaining power with vendors. Organized retailing has to first increase its share of the trade and then flex its muscles. While big retailers do get some preferential treatment from large suppliers, the relationship between the two is tense to say the least.

II. RESEARCH OBJECTIVES AND METHODOLOGY

The main objective of the research was to explore the retail revolution in the Delhi Region. Some specific objectives were as follows

1. To identify the factors in revolution of retail.
2. To identify the gender preference of retail departments.
3. To find the existing customers of retail.
4. To explore the reasons behind attracting customers toward retail stores.

Shoppers' Stop, Pantaloons, Westside, Ebony, Globus, Big Bazaar and Lifestyle are targeted through the survey by open ended and closed ended questionnaire.

III. LITERATURE REVIEW

A. Changing Scenario Of Indian Retail

The demographic profile of an Indian consumer is worth noting. The Indian consumers have the ability to spend over USD 30,000 a year (PPP terms) on prominent consumptions which represents 2.8% of the entire population. (What represents 2.8% of the total population?) It seems like a small percentage but when we consider the

mammoth Indian population of 1.07 billion people, this number amounts to 30 million people, a market next only to USA, Japan and China. Consumers are the king and they only drive the retail growth but it is in turn driven by following factors.

Increase in Urban Population: The Indian urban population is projected to increase from 28% to 40% of the total population by 2020 and incomes are simultaneously expected to grow in these segment.

Economic growth: The economic that will affect India is the increase in disposable income which is expected to rise at an average of 8.5% p.a. till 2015.It means greater disposable incomes for the booming Indian middle class, which currently comprises 22% of the total population. This figure is expected to increase to 32% by 2010.

Demographics: It is interesting to note that more than 50% of the population is less than 25 years of age and strong growth is expected to continue in this age bracket. They are early adopters and try to test new things. They like leading a

comfortable life and do not mind in spending more to get good quality products which are trendy as well as suit their desired personality.

*Credit availability***:** Moreover it is seen that retail loans play a major part in it. It has doubled in the last three years to reach USD 38.7 bn in 2005. It plays a major role in changing preferences in demand for lifestyle goods. Mindsets are shifting towards an organized retailing experience. Growth in malls can also be a leading factor for

organized retail surge. The number of malls is expected to rise from 158 in 2005 to 600 by 2010. With the advent of plastic money the people are having more disposable income at any point of time. They do not have to bother about saving they are more inclined towards staying at par thereby aiding growth in the retail.

MAJOR FORMATS OF IN-STORE RETAILING

Format	Description	The Value Proposition	Example
Branded Stores	Exclusive showrooms either owned or franchised out by a manufacturer.	Complete range available for a given brand, Certified product quality	Marks & Spencer Reebok Nike Adidas
Specialty Stores	Focus on a specific consumer need, carry most of the brands available	Greater choice to the consumer, comparison between brands possible	Music world Tanishq Health and Glow Crossword
Department Stores	Large stores having a wide variety of products, organized into different departments, such as clothing, house wares, furniture, appliances, toys, etc.	One stop shop catering to varied consumer needs	Shopper's Stop Pantaloon Westside Globus Ebony
Supermarkets	Extremely large self-services retail outlets.	One stop shop catering to varied consumer needs.	Food world Nilgiris Food Bazaar
Discount Stores	Stores offering discounts on the retail price through selling high volumes and reaping the economies of scale.	Low prices	Subhiksha Margin free Market
Hyper-mart	Larger than a Supermarket, sometimes with a warehouse appearance, generally located in quieter parts of the city	Low prices, vast choice available including services as cafeterias	Big Bazaar Giant
Shopping Malls	An enclosure having different formats of in-store retailers, all under one roof.	Variety of shops available close to each other.	Sahara Shopping Mall DT Mall Ansal Plaza Forum
Cash and Carry	It is a form of trade in which goods are sold from a wholesale warehouse operated either on a self-service basis, or on the basis of samples or a combination of the two.	Arrange the transport of the goods themselves and pay the goods in cash and not on credit	Metro Cash and Carry

Research Findings

Estimated retail space in India (mn sq ft)
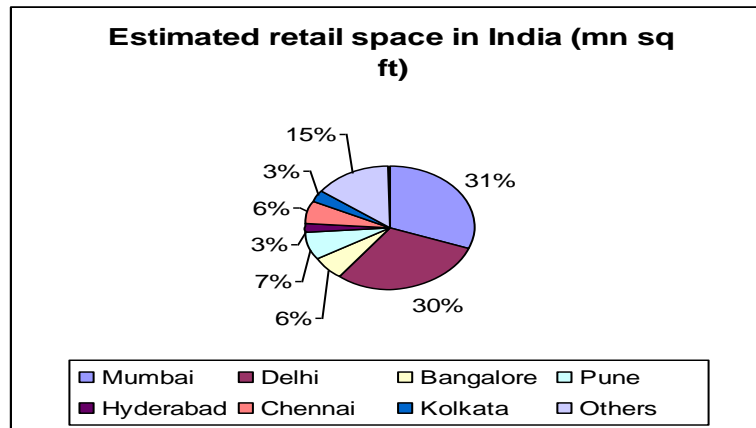
Estimated Shopping Floor Space Addition (mn sq ft)			
	2006	**2007(estimated)**	**Change**
Mumbai	6.6	19.8	200%
Delhi and NCR	6.5	41.0	527%
Bangalore	1.3	2.9	128%
Pune	1.2	3.5	188%
Hyderabad	6.7	1.8	163%
Total Large Cities	16.5	69	323%
Others	5.3	18.9	259%
Total All India	21.6	87.9	307%

Images Retail Industry

Earnings of average Delhiite

Year	Delhi	Growth (%)	All India	Growth (%)
2001-02	44,268		17283	
2002-03	45,579	2.9	19,040	6.8
2003-04	49,494	8.6	20,989	10.2
2004-05	53,976	9.1	23,241	10.7
2005-06	59,831	9.5	27,631	11.1
2006-07	64,132	9.7	31,043	11.5

Motivational Factor

Age Group Preference

Gender Preference
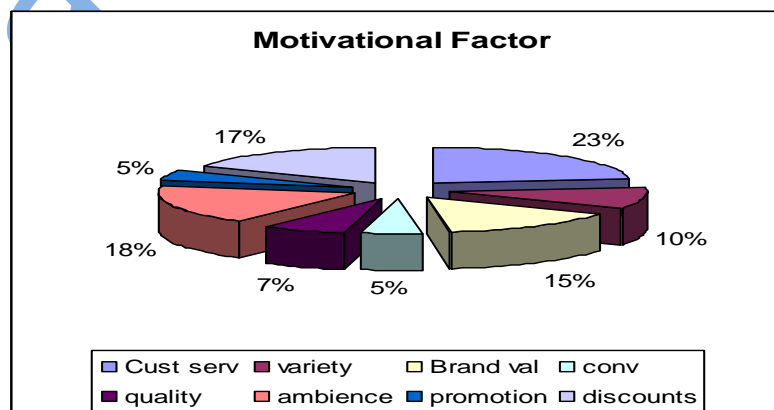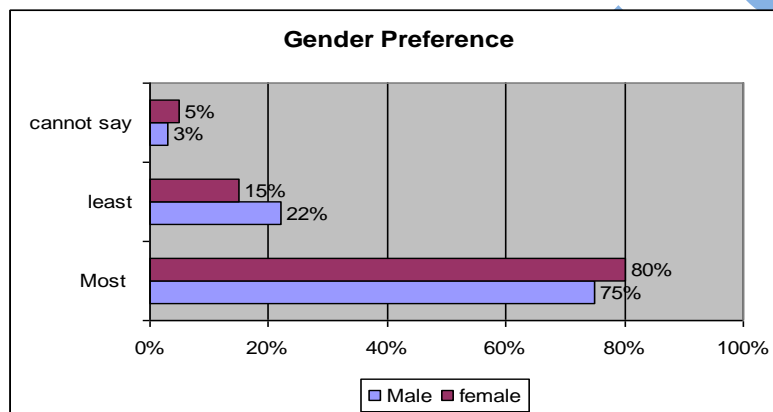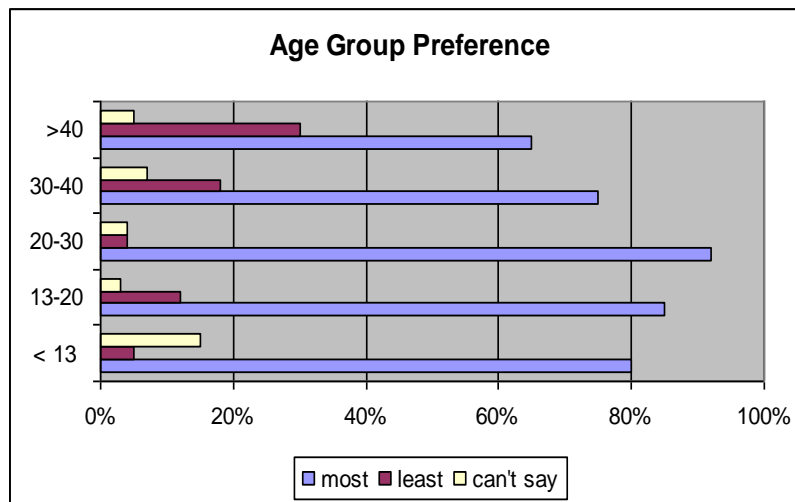
IV. RETAIL SPACE IN INDIA

Till the end of 2006, over 60% of malls in India will be in the 6 big metros which account for about 80% of the sector's revenues. Delhi and the National Capital Region (NCR) will account for about 50% of these malls. Tier I cities such as Mumbai, Delhi and

Bangalore clearly have the upper hand in terms of higher disposable incomes, better infrastructure, awareness levels, propensity to spend and an affluent urban youth population. The respective State Governments have also been proactive in permitting use of land for commercial development, thus increasing the availability of retail space.

It is seen that Delhi has a maximum number of retail space as compared to other states excepting Mumbai. So it gives a clear picture why Delhi is the preferred Destination for Retails.

Moreover if we consider the estimated growth in shopping space then Delhi leads the way. It is estimated to have a massive growth of 527% by 2007 which is much higher than any other cities. It is estimated that Delhi will claim to be the retail hub of India.

A.   Average Earning of Delhilite

The economy is booming like never before and the per capita Income is more than double the National average. According to the Delhi government estimates of State Domestic Product (SDP) 2004-05, the per capita income of Delhi is INR53, 976, up 9.1% compared with INR49, 494 in 2003-04. The growth rate of Delhi's per capita income has been climbing steadily. Its increase in 2003-04 was 8.6% compared 2002-03, and then increased by 9.1% in 2004-05 compared to a year earlier.

B.   Various Motivational Factors

The Survey mainly focused on sensory elements and structural elements of perception. The objective of the thesis was to gauge people's perception of a particular departmental store. It tries to identify various motivations that drive customers to visit a departmental store regularly.

There can be various motivations that act as a driving force and the study has mainly concentrated on eight such driving factors like:

- Customer service

- Brand value

- Variety or the merchandise displayed

- Convenience

- Quality

- Ambience

- Ad Promos

- Discounts

C.   Age Group Preference

It is seen in the survey that even kids and teens are no more gullible customers and they can influence the buying behavior of their parents. The survey tells that 80% of the kids below 13 preferred staffs that are helpful and courteous. It is seen that the people between 20-30 preferred going to a departmental store to buy latest material and they prefer staff with good product knowledge, who are well groomed and courteous.

D.   Gender Preference

It is seen that both men and women give a lot of importance to customer service and females are found to be finicky about the service that a departmental store is providing. Men as well as female do not like interference in selection and they only like to take the help of the sales personnel only if they cannot find the size or are unable to find the selection. Indians believe in touch and feel and they would not like to buy unless they have seen it touching. In the survey, it was seen that most of the customers especially female gave a lot of emphasis on the look of the sales personnel and the way they talk. It was also seen that a departmental store is preferred over another if they have well groomed, sophisticated sales personnel fluent in English. This is one of the reasons why a Globus and Ebony was rated low by customers.

In the survey, it came out that both male and female are attracted to the departmental store if their service is good.

V.   CONCLUSION

In order to satisfy the customer needs the retailer must have a thorough understanding of how customer make store choice and purchase decision. Perceptual mapping of the consumers provides some valuable insights into the process and therefore is useful for the store management decision making.

It is important to realize the purchase of products involves motivational, social, psychological and economic factors.

Retail consumers therefore need to be understood on a variety of levels.

- They are problem solvers deciding on what offer satisfies their needs. All retail activities and promotions should therefore aid the customer to make a decision.

- Consumers seek to reduce the risk of their purchase. Retailers needs to provide information, guarantees and after sales services to reduce the perception of risk.

- Consumer will go shopping for a variety of reasons. The complexity of the shopping trip per se should be clear to retail staff.

- There are a number of demographic and other changes which are having an impact on the patterns of purchasing and consumption

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Retailer's Optimal Replenishment Policy With Defective Products Under Cash Discount And Two-Level Trade Credit Policy

Hairong Feng[1] Jun Li[2] Ying Zeng[3]

Abstract- **In this paper, we develop a model to determine an optimal replenishment policy with defectiveitems under cash discount and two levels of trade credit policy. We assume that the retailer adopts the trade credit policy to stimulate his/her customer, and the trade credit policy adopted by the supplier discussed in this paper is a "two-part" strategy: cash discount and delay of payment. That is, if the payment is paid within $M1$, the retailer receives a cash discount; otherwise, the full purchasing price must be paid before $M2$, where $M2 > M1 \geq 0$. We also assumed that 100% of each lot are screened to separate good and defective items which are classified asimperfect quality and scrap items. Difference between unit selling price and unit purchase cost is also included in our mathematical model and analysis. Under this assumption, we model the retailer's inventory system as a profit maximization problem to determine the retailer's optimal inventory cycle time and optimal order quantity. Then, we develop easy-to-use theorem to locate the optimal replenishment policy for the retailer. Finally, numerical examples are given to illustrate the theorem and obtain some managerial phenomena.**

Keywords-Inventory; EOQ; Defective items; Two levels of trade credit policy; Cash discount

I. Introduction

The traditional economic order quantity (EOQ) model assumes that the retailer must pay for thepurchased items as soon as items are received. This is not always true in the actual business world.In fact, the supplier usually permits the retailer a delay of a fixed time period to settle the total amount owed to him. Usually, interest is not charged for the outstanding amount if it is paid within the permissible delay period. It is beneficial for supplier to permit permissible delay in payment. For example, it will attract some retailers who consider it to be a type of price reduction, and then promote the supplier's sale and reduce the on-hand stock level. Permissible delay in payments also provides advantages to the retailer due to the fact that the retailer can earn the interest on the accumulated revenue received. As a result, with no incentive for making early payments, the retailer may postpone payment up to the last moment of the permissible period allowed by the supplier. From the viewpoint of the supplier, offering trade credit may lead to delayed cash inflow and increase the risk of cash flow shortage and bad debt. Hence, the supplier hopes that the

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payment will be made by the retailer as soon as possible. Therefore, in most business transactions, the supplier not only allows a certain fixed period for settling the account but may also offer a cash discount to encourage the retailer to pay for his purchases quickly. The retailer can obtain the cash discount when the payment is paid within cash discount period offered by the supplier. Otherwise, the retailer will pay full payment within the trade credit period. In general, the cash discount period is shorter than the trade credit period. For example, the supplier agrees to a 2% discount off the retailer's purchasing price if payment is made within 10 days. Otherwise, full payment is required within 30 days after the delivery, and the credit term in financial management is usually denoted as "2/10, net 30" (Brigham, 1995). Over years, a number of researches have been published which dealt with the inventory model under permissible delay of payments. Goyal (1985) suggested a mathematical model for obtaining the economic order quantity under permissible delay in payments. Aggarwal and Jaggi (1995) considered the inventory model with an exponential deterioration rate under the condition of permissible delay in payments. Jamal, Sarker, Wang (1997) extended this issue with allowable shortage. Ouyang et al. (2006) generalized Jamal, Sarker, Wang's results by considering the partial backlogging rate and the unit selling price is different from the unit purchase cost. Chung and Huang (2003) extended Goyal's model by considering the units are replenished at a finite rate. Teng (2002) amended Goyal's model by considering the difference between unit price and unit cost, and found that the economic replenishment interval and order quantity decrease under the permissible delay in payments in certain cases. Chung and Huang (2009) extended Goyal's model by considering allowable shortage and presented a theorem to determine the optimal order quantity. All the previous models assumed that the permissible delay of payment was fixed and set by the supplier. Jamal, Sarker, and Wang (2000) developed a retailer's model for optimal cycle and payment times for a retailer in a deteriorating-item inventory situation where a wholesaler allows a specified credit period to the retailer for payment without penalty. Song and Cai (2006) corrected a flaw in Jamal, Sarker, andWang (2000)'s work, developed the correct model and derived the corresponding optimal solution. Huang and Chung (2003) extended Goyal's (1985) model with cash discount and determined the optimal cycle time and the optimal payment policy in the EOQ model under cash discount and

trade credit so that the annual total relevant cost is minimized. Huang (2005) extended Huang and Chung (2003)'s model by considering the difference between unit price and unit cost. Ouyang et al. (2007) established an EOQ model with limited storage capacity, in which the supplier provides cash discount and permissible delay in payments for the retailer. Ho et al.

(2008) formulated an integrated supplier-buyer inventory model with the assumptions that the market2 demand is sensitive to the retail price and the supplier offers two payment options: trade credit and early-payments with discount price to the buyer. All of the above models assumed that the supplier would offer the retailer a permissible delay ofpayments. That is one level of trade credit. Huang (2003) pointed out that the retailer may also adopt the trade credit policy to stimulate his/her customer demand in most business transactions. Huang (2007) defined this situation as two levels of trade credit policy, and incorporated both Chung and Huang (2003) and Huang (2003) to investigate the optimal retailer's replenishment decisions with two levels of trade credit policy in the EPQ framework. Teng and Chang (2009) overcame a shortcoming in Huang (2007)'s model and proposed the generalized formulation to the problem. On the other hand, in the traditional EOQ model, it is tacitly assumed that 100% of ordered items are perfect. However, in real-life situations, due to process deterioration or other factors such as damages and breakages during the handling process, production of defective items is inevitable. Starting from this point, researchers have developed different EOQ and economic production quantity (EPQ) models with percentage defective items. For example, Rosenblatt and Lee (1986) proposed an EPQ model for a production system which contains defective production. Zhang and Gerchak (1990) considered a joint lot sizing and inspection policy in an EOQ model where a random proportion of units were defective. Salameh and Jaber (2000) developed an EOQ model for items with imperfect quality. Later, Goyal and C´ardenas-Barr´on (2002) reworked on the paper by Salameh and Jaber (2000) and presented a practical approach to lead to a near optimal order quantity. Parachristos and Konstantaras (2006) re-studied Salameh and Jaber's model and discussed many of its assumptions, and in particular, those aimed at avoiding shortages. Maddah and Jaber (2008) corrected a flaw in Salameh and Jaber's work and developed a simpler expression for the optimal order quantity than that in Salameh and Jaber's paper. Jaber et al. (2008) extended the model of Salameh and Jaber(2000) by assuming that the percentage defective in a shipment reduces in conformance with a learning curve. Wahab and Jaber (2009) proposed models based on Salameh and Jaber (2000), Maddah and Jaber (2008) and Jaber et al. (2008) with different holding costs for the good items and defective items. Chung et al. (2008) developed a deterministic inventory model for defective items with two warehouses by maximizing the annual total profit. Recently, Chung and Huang (2006) developed an inventory model with defective items under permissible delay of payments.

Chen and Kang (2009) developed integrated vendor-buyer models that consider a permissible delay in payment and imperfectquality to determine the optimal solutions of the buyer's order quantity and the frequency for each vendor's production run.Therefore, in this study, for advancing practical use in a real world, we propose an inventory

model with defective products under two levels of trade credit policy. A deterministic defective rate is assumed and defective items are handled in the same way as proposed in Salameh and Jaber (2000). Furthermore, we adopt Teng (2002)'s viewpoint that the retailer's unit selling price and the purchasing price per unit are not necessarily equal. We also assume that the supplier provides the retailer with a permissible delay of payment and the retailer also adopts the trade credit policy to stimulate his/her customer. The trade credit policy adopted by the supplier "two-part" trade credit policy: cash discount3 and delay of payment. That is, if the retailer pays within $M1$, the buyer receives a cash discount; otherwise, the full purchasing price must be paid before $M2$, where $M2 > M1 \geq 0$. Consequently, in this paper, we establish EOQ model with defective items under conditions of cash discount and twolevel trade credit. In addition, based on the maximization of retailers' profit, we develop an easy-to-use theorem to find the optimal order quantity and optimal order cycle time. Finally, some numerical examples are given to illustrate the theoretical results and obtain a lot of managerial phenomena.

II. NOTATION AND ASSUMPTIONS

The following notation is used throughout this paper.

D annual demand rate

Q order size

c purchasing cost per unit

K fixed ordering cost per order

p percentage of defective items in Q

s selling price of items of good quality per unit

vd selling price of defective items per unit, $vd < s$

d screening cost per unit

x annual screening rate

h stock-holding cost per unit per year

Id interest earned per \$ per year

Ic interest charged per \$ per year

$M1$ retailer's fixed period of cash discount

$M2$ retailer's fixed period of permissible delay in settling accounts, with $M2 > M1$

N customers fixed period of permissible in settling accounts

δ cash discount rate, $0 < \delta < 1$

T inventory cycle length of each cycle

$T*$ optimal replenishment cycle time

$Q*$ optimal order quantity

In addition, the following assumptions are made in the model:

(1) There is single-supplier and single-retailer for a single product in this model.

(2) The demand rate is known, constant, and continuous.

(3) The lead-time is zero.

(4) Shortages are not allowed.

(5) Each order is subjected to a 100% inspection process at a rate of x units per unit time, the screening rate x is sufficiently large such that $t = Q$

(6) To speed up cash in flow and reduce the risk of cash flow shortage, the supplier offers a discount,

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δ ($0 < \delta < 1$), off the retailer's unit purchasing price, if the retailer settles the account at time $M1$. Otherwise, the full price of the purchase is charged.

(7) During the credit period (i.e., $M1$ or $M2$), the retailer sells the items and uses the sales revenue to

earn interest at a rate of Id. At the end of this period, the retailer pays off all purchasing cost to the

supplier and starts paying for the interest charges for the items in stock with rate Ic.

III. MODEL FORMULATION

In this section, we formulate an inventory model with defective items under cash discount and two

levels of trade credit policy. The total annual variable cost consists of the following elements.

1. Ordering cost per cycle. The ordering cost per cycle is K.

2. Holding cost per cycle. With the stock-holding cost per unit per year h, the holding cost per

cycle is $h[\frac{Q(1-p)T}{2} + \frac{pQ2}{x}]$.

3. Purchasing cost per cycle.

Case 1 Payment is paid at time $M1$. The annual cost of purchasing units is $(1 - \delta)cQ$.

Case 2 Payment is paid at time $M2$. The annual cost of purchasing units is cQ.

4. Sales revenue per cycle. The sales revenue per cycle is the sum of total sales volume of good

quality and imperfect quality, $sQ(1 - p) + vdQp$.

5. Screening cost per cycle. According to Assumption (5), the screening cost is dQ.

x

$\leq M1$ (We adopt this assumption as that of Chung and Huang (2006).

6. According to assumption (7), as well as the values of N and $M1$ or $M2$, there are two cases that

occur in interest charged and interest earned per year.

Case 1 Payment is paid at time $M1$.

Case 1.1-A $N \leq M1$, $T + N < M1$, as shown in Figure 1.

In this case, the retailer can earn interest with rate Id on average sales revenue for the time

period $[N, T + N]$ and full sales revenue from for the time period $[T + N, M1]$. At $M1$ the

accounts are settled, and the permissible payment time expires on or after the credit sales

are completely realized. Consequently, there is no interest payable, and the interest earned is

$sId(\int_0^T Dtdt + DT(M1 - T - N)) + vdIdpQ(M1 - t) = sDIdT(M1 - N - \frac{T}{2}) + vdIdpQ(M1 - t)$.

Case 1.1-B $N \leq M1$, $M1 \leq T + N$, as shown in Figure 2.

In this case, the retailer can earn interest on average realized credit sales revenue with rate

Id for the time period $[N, M1]$. At $M1$ the accounts are settled, and the permissible payment

time expires on or before the credit sales are not completely realized. Consequently, the interest

payable for these items is $c(1-\delta)Ic \int_{T+N}^{M1} D(T + N - t)dt = c(1-\delta)IcD\frac{(T+N-M1)2}{2}$, and the interest

earned is $sId \int_0^{M1-N} Dtdt + vdIdpQ(M1 - t) = sDId \frac{(M1 - N)2}{2} + vdIdpQ(M1 - t)$.

Inventory Level

Q

DT

pQ

Interest earned on sales revenue from perfect quality

Time

t N T T+N M_1 or M_2

Figure 1: $T + N < M_1$ or $T + N < M_2$

Inventory Level

Q

DT

pQ

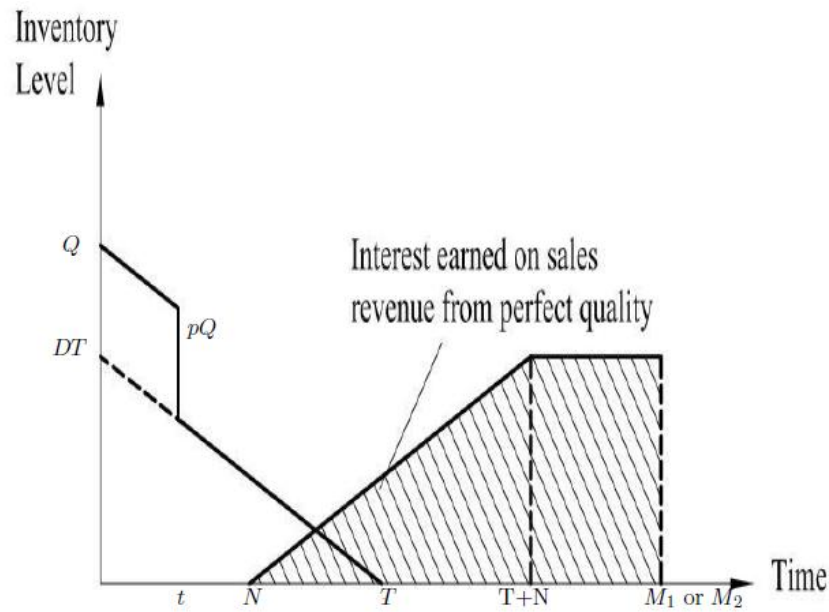Interest earned on sales revenue from perfect quality
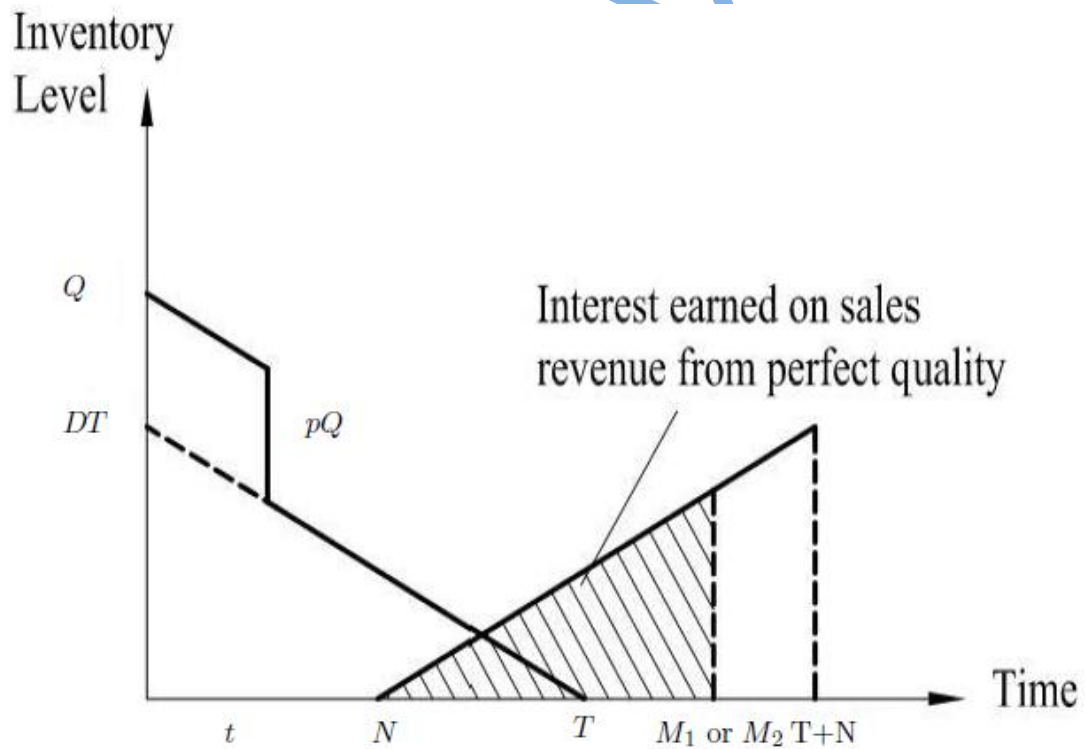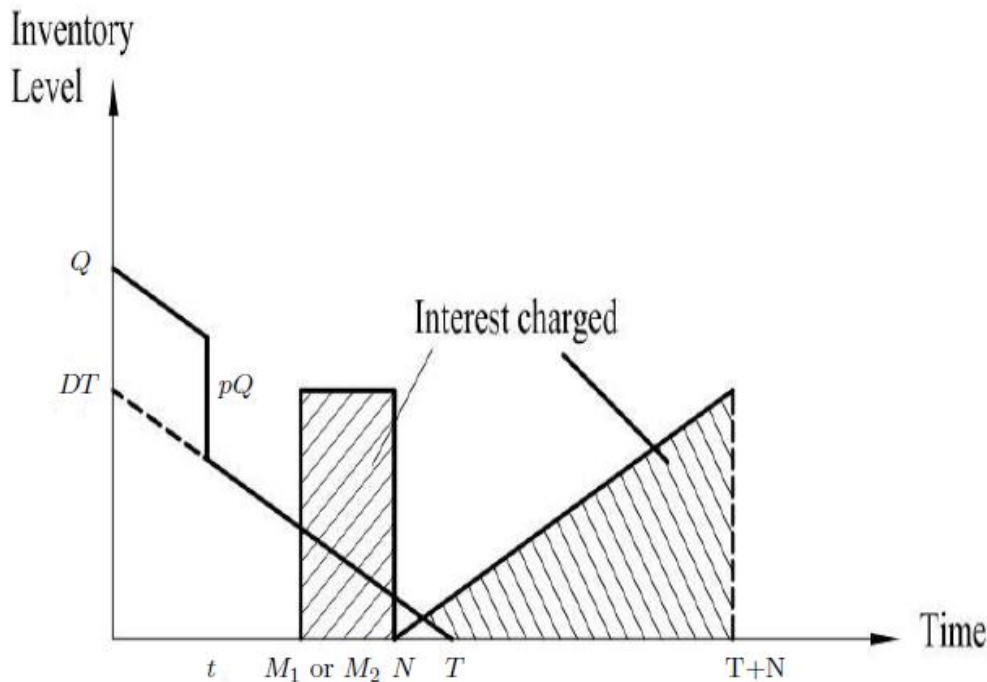
Time

t N T M_1 or M_2 T+N

Figure 2: $T + N \geq M_1$ or $T + N \geq M_2$

Figure 3: $N \geq M_1$ or $N \geq M_2$

Case 1.2 $M1 \leq N$, as shown in Figure 3.

In this case, the customer's trade credit period N is equal to or larger than the supplier's credit

period $M1$, the retailer earns no interest on sales revenue from perfect quality, and pays interest

on full order quantity for a period of $(N - M1)$ and on average stock held during the cycle length

T. Consequently, the interest payable is $c(1-\delta)Ic[DT(N -M1)+ \frac{DT2}{2}]$, and the interest earned

is $vdIdpQ(M1 - t)$.

Case 2 Payment is paid at time $M2$.

Case 2.1-A $N \leq M2$, $T + N < M2$, as shown in Figure 1.

In this case, the retailer can earn interest with rate Id on average sales revenue for the time

period $[N, T + N]$ and full sales revenue from for the time period $[T + N, M2]$. At $M2$ the

accounts are settled, and the permissible payment time expires on or after the credit sales

are completely realized. Consequently, there is no interest payable, and the interest earned is

$sId(\int_{T0} Dtdt + DT(M2 - T - N)) + vdIdpQ(M2 - t) = sDIdT(M2 - N - \frac{T2}{2}) + vdIdpQ(M2 - t)$.

Case 2.1-B $N \leq M2$, $M2 \leq T + N$, as shown in Figure 2.

In this case, the retailer can earn interest on average realized credit sales revenue with rate

Id for the time period $[N, M2]$. At $M2$ the accounts are settled, and the permissible payment

time expires on or before the credit sales are not completely realized. Consequently, the interest

payable for these items is cIc

$\int_{T+NM2} D(T + N - t)dt = \frac{cIcD(T+N-M2)2}{2}$, and the interest earned is $sId \int_{M2-N0} Dtdt + vdIdpQ(M2 - t) = \frac{sDId}{2}(M2 - N)2 + vdIdpQ(M2 - t)$.

Case 2.2 $M2 \leq N$, as shown in Figure 3.

In this case, the customer's trade credit period N is equal to or larger than the supplier credit

period $M2$. The retailer earns no interest on sales revenue from perfect quality, and pays interest

on full order quantity for a period of $(N - M2)$ and on average stock held during the cycle length

T. Consequently, the interest payable is $cIc[DT(N - M2) + \frac{DT2}{2}]$, and the interest earned is

$vdIdpQ(M2 - t)$.

From the above arguments, the total profit function for the retailer can be expressed as

$TL(T)$ =sales revenue+interest earned−ordering cost−stock-holding cost−purchasing

cost−screening cost−opportunity cost.

We show that the total profit per unit time for that retailer is given by

$TPL(T) = \begin{cases} TPL1(T), & \text{if the retailer settles the account at} \\ TPL2(T), & \text{if the retailer settles the account at } M2. \end{cases}$

Case (1) If the retailer settles the account at $M1$

$$TPL1(T) = \begin{cases} TPL11(T), \text{ if } N \le M1, T + N < M1, \\ TPL12(T), \text{ if } N \le M1, M1 \le T + N, \\ TPL13(T), \text{ if } M1 \le N, \end{cases}$$

(3.1)

where
$TPL11(T) = sD + vdD(1 + IdM1)p1 - p - (c(1 - \delta) + d)D11$
$- p + sIdD(M1 - N) - T[D2p(1-p)2$
$x(h + vdId) + hD + sDId2] - KT,$

(3.2)

$TPL12(T) = sD + vdD(1 + IdM1)p1 - p - (c(1 - \delta) + d)D11$
$- p + c(1 - \delta)IcD(M1 - N) - T[D2p$

where

$(1-p)2x(h + vdId) + hD + c(1 - \delta)IcD2] - 1T[K - D(M1 - N)22(sId - c(1 - \delta)Ic)].$

(3.3)

$TPL13(T) = sD + vdD(1 + IdM1)p1 - p$
$- (c(1 - \delta) + d)D11 - p + c(1 - \delta)IcD(M1 - N) - T[D2p(1-p)2x(h + vdId) + hD + c(1 - \delta)IcD 2] - KT$
.

(3.4)

Case (2) If the retailer settles the account at $M2$

$$,TPL2(T) = \begin{cases} TPL21(T), \text{ if } N \le M2, T + N < M2, \\ TPL22(T), \text{ if } N \le M2, M2 \le T + N, \\ TPL23(T), \text{ if } M2 \le N, \end{cases}$$

(3.5)

$$TPL_{21}(T) = sD + v_dD(1 + I_dM_2)\frac{p}{1-p} - (c+d)D\frac{1}{1-p} + sI_dD(M_2 - N)$$
$$- T[D^2\frac{\frac{p}{(1-p)^2}}{x}(h + v_dI_d) + \frac{hD + sDI_d}{2}] - \frac{K}{T},$$

(3.6)

$$TPL_{22}(T) = sD + v_dD(1 + I_dM_2)\frac{p}{1-p} - (c+d)D\frac{1}{1-p} + cI_cD(M_2 - N)$$
$$- T[D^2\frac{\frac{p}{(1-p)^2}}{x}(h + v_dI_d) + \frac{hD + cI_cD}{2}]$$
$$- \frac{1}{T}[K - \frac{D(M_2 - N)^2}{2}(sI_d - cI_c)].$$

(3.7)

$$TPL_{23}(T) = sD + v_dD(1 + I_dM_2)\frac{p}{1-p} - (c+d)D\frac{1}{1-p} + cI_cD(M_2 - N)$$
$$- T[D^2\frac{\frac{p}{(1-p)^2}}{x}(h + v_dI_d) + \frac{hD + cI_cD}{2}] - \frac{K}{T}.$$

(3.8)

IV.   MODEL ANALYSIS AND SOLUTION

Now, we shall determine the optimal replenishment cycle time that maximizes the expected total profit.

Case 1. If payment is paid at $M1$.
Let TPL'
$1j(T) = 0$ ($j = 1, 2, 3$), we can obtain

$$T_{11}^* = \sqrt{\frac{2K}{2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+sDI_d}}, \qquad (4.9)$$

$$T_{12}^* = \sqrt{\frac{2K - D(M_1-N)^2(sI_d - c(1-\delta)I_c)}{2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+c(1-\delta)DI_c}}, \qquad (4.10)$$

if $2K - D(M_1-N)^2(sI_d - c(1-\delta)I_c) \geq 0$,

$$T_{13}^* = \sqrt{\frac{2K}{2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+c(1-\delta)I_c}}, \qquad (4.11)$$

Eq. (4.9) gives the optimal value of T^* for the case when $T < M_1 - N$, so that $T_{11}^* < M_1 - N$. We substitute Eq. (4.9) into $T_{11}^* < M_1 - N$, then we can obtain that $T_{11}^* < M_1 - N$ if and only if $2K - [2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+sDI_d](M_1-N)^2 < 0$.

Similarly, Eq. (4.10) gives the optimal value of T^* for the case when $T \geq M_1 - N$, so that $T_{12}^* \geq M_1 - N$. We substitute Eq. (4.10) into $T_{12}^* \geq M_1 - N$, then we can obtain that $T_{12}^* \geq M_1 - N$ if and only if $2K - [2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+sDI_d](M_1-N)^2 \geq 0$.

Let $\Delta_1 = 2K - [2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+sDI_d](M_1-N)^2$, then we have the following results.

Theorem 4.1.   1. When $N \leq M_1$,

(a) if $\Delta 1 < 0$, then $T* = T*$ 11.
(b) if $\Delta 1 \geq 0$, then $T* = T*$ 12.
2. When $M1 \leq N$, then $T* = T*$ 13
Proof. See Appendix A.

It follows from Theorem 4.1 that when the supplier's cash discount period increases, the optimal replenishment time and the optimal order quantity will be nonincreasing, and hence the retailer may shorten the cycle time to increase the frequency of replenishment and enjoy the benefits of cash discount period more frequently.

Case 2. If payment is paid at M_2. Let $TPL'_{2j}(T) = 0$ $(j = 1, 2, 3)$, we can obtain

$$T_{21}^* = T_{11}^* = \sqrt{\frac{2K}{2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+sDI_d}}, \qquad (4.12)$$

$$T_{22}^* = \sqrt{\frac{2K - D(M_2-N)^2(sI_d - cI_c)}{2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+cDI_c}}, \qquad (4.13)$$

if $2K - D(M_2-N)^2(sI_d - cI_c) \geq 0$,

$$T_{23}^* = \sqrt{\frac{2K}{2D2^{\frac{p}{(1-p)^2}}\frac{}{x}(h+v_dI_d)+hD+cI_c}}, \qquad (4.14)$$

Eq. (4.12) gives the optimal value of $T*$ for the case when $T < M2 - N$, so that $T*$ 21 $< M2 - N$.

We substitute Eq. (4.12) into $T*$ 21 $< M2 - N$, then we can obtain that $T*$ 21 $< M1 - N$ if and only if

$2K - [2D2$

p

$(1-p)2$

$x (h + vdId) + hD + sDId](M2 - N)2 < 0;$

Similarly, Eq. (4.13) gives the optimal value of $T*$ for the case when $T \geq M2 - N$, so that

$T*$

22

$\geq M2 - N$. We substitute Eq. (4.13) into $T*$

22

$\geq M2 - N$, then we can obtain that $T*$

22

$\geq M2 - N$

if and only if $2K - [2D2$

p

$(1-p)2$

$x (h + vdId) + hD + sDId](M2 - N)2 \geq 0.$

Let $\Delta 2 = 2K - [2D2$

p

$(1-p)2$

$x (h + vdId) + hD + sDId](M2 - N)2$, then we have the following results.

Theorem 4.2. 1. When $N \leq M2$,

(a) if $\Delta 2 < 0$, then $T* = T*$

$21.$

(b) if $\Delta 2 \geq 0$, then $T* = T*$

$22.$

2. When $M2 \leq N$, then $T* = T*$

$23.$

Proof. See Appendix B.

It follows from Theorem 4.2 when the supplier's trade credit period increases, the optimal replenishment time and the optimal order quantity will be nonincreasing, and hence the retailer may shorten the cycle time to increase the frequency of replenishment and enjoy the benefits of trade credit period more frequently.

Combining Theorem 4.1-Theorem 4.2, we can have the following result

Theorem 4.3.   1. When $N \leq M_1$,

(a) if $\Delta_1 < 0$, $TPL(T^*) = \max\{TPL_1(T^*_{11}), TPL_2(T^*_{11}\}$, then $T^* = T^*_{11}$.

(b) if $\Delta_1 \geq 0 > \Delta_2$, $TPL(T^*) = \max\{TPL_1(T^*_{12}), TPL_2(T^*_{11}\}$, then $T^* = T^*_{11}$ or T^*_{12}.

(c) if $\Delta_2 \geq 0$, $TPL(T^*) = \max\{TPL_1(T^*_{12}), TPL_2(T^*_{22}\}$, then $T^* = T^*_{12}$ or T^*_{22}.

2. When $M_1 \leq N \leq M_2$,

(a) if $\Delta_2 < 0$, $TPL(T^*) = \max\{TPL_1(T^*_{13}), TPL_2(T^*_{11}\}$, then $T^* = T^*_{13}$ or T^*_{11}.

(b) if $\Delta_2 \geq 0$, $TPL(T^*) = \max\{TPL_1(T^*_{13}), TPL_2(T^*_{22}\}$, then $T^* = T^*_{13}$ or T^*_{22}.

3. When $M_2 \leq N$, $TPL(T^*) = \max\{TPL_1(T^*_{13}), TPL_2(T^*_{23}\}$, then $T^* = T^*_{13}$ or T^*_{23}.

V. NUMERICAL RESULTS

To illustrate all results obtained in this paper, let us apply the proposed method to efficiently solve the following numerical examples. For convenience, the values of the parameters are selected randomly. Example 1. In this example, we study the effect of the percentage of defective items in an ordered lot on the expected value of the total annual profit, and the optimal cycle time. Let $D = 7200$

units/year, c =$20/unit, δ = 0.01, Ic =0.1/year, Id =$0.07/$/year, h =$4/unit/year, s =$30/unit, $M1$ = 0.1 years, $M2$ = 0.2 years, N = 0.04 years, x = 10000 units/year, vd =$5/unit, d =$0.05/unit. From Table 1, We can observe the optimal cycle time and the optimal order quantity with various values of p, and K.

Table 1 The optimal cycle time with various p, and K

K	p	Δ_1	Δ_2	T^*	$Q(T^*)$	$TPL(T^*)$
50	0.005	< 0	< 0	0.0476	344.39	71416.07
	0.01	< 0	< 0	0.0475	345.23	70863.09
	0.015	< 0	< 0	0.0473	346.05	70304.44
	0.02	< 0	< 0	0.0472	346.88	69740.06
120	0.005	> 0	< 0	0.0737	533.53	70262.14
	0.01	> 0	< 0	0.0735	534.82	69706.12
	0.015	> 0	< 0	0.0733	536.11	69144.39
	0.02	> 0	< 0	0.0731	537.39	68576.87
720	0.005	> 0	> 0	0.1809	1309.21	65544.81
	0.01	> 0	> 0	0.1804	1312.32	64976.35
	0.015	> 0	> 0	0.1800	1315.41	64401.97
	0.02	> 0	> 0	0.1795	1318.49	63821.56

Based on the computational results as shown in Table 1, we have the following comments.

(1) When p increases, the optimal order quantity will be increasing, it implies that the retailer order more quantity to satisfy the annual demand with perfect quality. As the percentage of defective items in an ordered lot increases, the retailer will sell the the more quantities at a lower price, and then the expected value of the total annual profit will be decreasing.

(2) For fixed other parameters, when the fixed ordering cost, K, is increasing, the optimal replenishment cycle time will be increasing, and the total profit will be decreasing. This implies that if the fixed ordering cost is higher, it is reasonable that the retailer will length the cycle time to reduce the frequency of replenishment.

Example 2. In this example, we study the effects of cash discount rate on performance. Let $K = 120$\$/order, $D = 7200$ units/year, $c = \$20$/unit, $Ic = \$0.1$\$/year, $Id = \$0.07$/\$/year, $h = \$4$/unit/year, $s = \$30$/unit, $M_1 = 0.1$ years, $M_2 = 0.3$ years, $x = 10000$ units/year, $vd = \$5$/unit, $d = \$0.05$/unit, and $p = 0.01$. We obtain the optimal replenishment cycle time, profit, and the optimal payment time for different parameters of δ as shown in Table 2.

Table 2 The optimal cycle time with various δ

N	δ	T^*	$Q(T^*)$	$TPL(T^*)$	Optimal payment time
0.05	0.01	0.0735	534.82	71069.47	M_2
	0.02	0.0735	534.82	71069.47	M_2
	0.03	0.0741	538.64	72408.43	M_1
	0.04	0.0741	539.13	73863.54	M_1
0.15	0.01	0.0735	534.82	69957.47	M_2
	0.02	0.0735	534.82	69957.47	M_2
	0.03	0.0745	541.90	70992.25	M_1
	0.04	0.0746	542.81	72459.36	M_1
0.35	0.01	0.0741	539.21	66596.05	M_2
	0.02	0.0744	541.00	66702.74	M_1
	0.03	0.0745	541.90	68198.65	M_1
	0.04	0.0746	542.81	69694.56	M_1

Based on the computational results as shown in Table 2, we can obtain the following managerial insights:

(1) When the value of δ increases, the optimal cycle time and optimal order quantity will be nondecreasing, and the retailer's optimal payment may shift from M_2 to M_1. This implies that when the cash discount rate increases, the retailer may pay for his purchases quickly to get a cash discount rather than pay off the payment at the end of credit period for taking the benefits of permissible delay of payment.

(2) When customer's trade credit period increases, then the optimal replenishment cycle time and the optimal order quantity will be nondecreasing. This implies that the retailer will order more quantity to get more interest earned offered by the supplier to compensate the loss of interest earned from longer trade credit period offered to his/her customer

Example 3. In this example, we evaluate the performances for various values of the problem parameters, s, and h. Let $K = 120\$$/order, $D = 7200$ units/year, $c = \$20$/unit, $\delta = 0.01$, $Ic=\$0.1\$$/year, $Id=\$0.07/\$$/year, $M_1 = 0.1$ years, $M_2 = 0.2$ years, $x = 10000$ units/year, $vd=\$5$/unit, $d=\$0.05$/unit, and $p = 0.01$. We obtain the optimal replenishment cycle time, and the profit for different parameters of s and h as shown in Table 3.

Table 3 The optimal cycle time with various s and h

N	s	h	T^*	$Q(T^*)$	$TPL(T^*)$
0.05	30	4	0.0735	534.82	69554.92
	30	6	0.0638	463.88	69055.83
	30	8	0.0571	415.29	68615.59
	40	4	0.0697	506.82	142130.59
	50	4	0.0663	482.80	214715.24
0.15	30	4	0.0743	540.10	68058.05
	30	6	0.0643	467.32	67554.69
	30	8	0.0574	417.75	67111.54
	40	4	0.0719	522.79	140132.12
	50	4	0.0698	507.98	212221.02
0.35	30	4	0.0743	540.10	65206.85
	30	6	0.0643	467.32	64703.49
	30	8	0.0574	417.75	64260.34
	40	4	0.0742	540.10	137206.85
	50	4	0.0742	540.10	209206.85

Based on the computational results as shown in Table 3, we can obtain the following managerial insights:

(1) When the unit selling price, s, is nondecreasing, the optimal cycle time for the retailer will be decreasing. However the retailer's expected value of the total annual profit is increasing. It implies that if the retailer increases his selling price, he can shorten the cycle time to increase the frequency of replenishment and enjoy the benefits of the permissible delay of payment more frequently.

(2) When the holding cost, h, is increasing, the optimal cycle time and the expected value of the total annual profit will be decreasing. So it is reasonable that when the holding cost increases, the retailer will shorten the cycle time to increase the frequency of replenishment.

VI.   SUMMARY AND CONCLUSIONS

In this paper, we develop a inventory model of the retailer to allow items with imperfect quality under cash discount and trade credit by considering the following situations simultaneously: (1) the retailer's unit selling price and the purchasing price per unit are not necessarily equal, (2) the retailer adopts the trade credit policy to stimulate his/her customer, (3) the trade credit policy adopted by the supplier discussed in this paper is a "two-part" strategy: cash discount and delay of payment. That is, if the retailer pays within M_1, he can receive a cash discount; otherwise, the full purchasing price must be paid before M_2, where $M_2 > M_1 \geq 0$, (4) a random defective rate is assumed. Furthermore,

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we established theoretical result which is given as Theorem 4.3 to determine the optimal solution under various conditions. Finally, numerical examples are given to illustrate the theoretical results and obtain some managerial insights.

Based on our analysis, it is found that if the supplier wants to promote cash inflow and reduce the risk of cash flow shortage and bad debt, he may increase the cash discount rate since the retailer's payment time will shift from trade credit, M_2 to cash discount period, M_1. If the retailer settles the account at M_1, he can shorten the cycle time to increase the frequency of replenishment and enjoy

the benefits of the cash discount period more frequently when the unit selling price or the unit stockholding
cost increases, and order more quantity to accumulate more interest to compensate the loss
of interest earned when longer trade credit period is offered to his/her customer when the customers
trade credit period offered by the retailer increases. If the retailer settles the account at $M2$, he can
shorten the cycle time to increase the frequency of replenishment and enjoy the benefits of the trade
credit period more frequently when the unit selling price or the unit stock-holding cost increases, and
order more quantity to accumulate more interest to compensate the loss of interest earned when longer
trade credit period is offered to his/her customer when the customers trade credit period offered by

the retailer increases.

VIII. Appendix A

It follows from (3.2)-(3.3) that $TPL11(M1 - N) = TPL12(M1 - N)$, hence $TPL1(T)$ is well defined.
Eqs. (3.2)-(3.3) yield

$$TPL'_{11}(T) = -[D^2 \frac{\frac{p}{(1-p)^2}}{x}(h + v_d I_d) + \frac{hD + sDI_d}{2}] + \frac{K}{T^2}, \tag{6.15}$$

$$TPL''_{11}(T) = -\frac{2K}{T^3} < 0, \tag{6.16}$$

$$TPL'_{12}(T) = -[D^2 \frac{\frac{p}{(1-p)^2}}{x}(h + v_d I_d) + \frac{hD + c(1-\delta)I_c D}{2}]$$
$$+ \frac{1}{T^2}[K - \frac{D(M_1 - N)^2}{2}(sI_d - c(1-\delta)I_c)], \tag{6.17}$$

$$TPL''_{12}(T) = -\frac{2}{T^3}[K - \frac{D(M_1 - N)^2}{2}(sI_d - c(1-\delta)I_c)]. \tag{6.18}$$

Eq. (6.16) implies that $TPL11(T)$ is concave on $T > 0$, and Eq. (6.18) implies that $TPL12(T)$ is
concave on $T > 0$ when $K - D(M1 - N)2$
$2(sId - c(1 - \delta)Ic) > 0$. Hence, if $T1j$ exists for $j = 1, 2$, then

$$T1_j(T) \begin{cases} > 0, \text{if } T < T*1_j, \\ = 0, \text{if } T = T*1_j, \\ < 0, \text{if } T > T*1_j. \end{cases}$$

Let $\Lambda = K - D(M1-N)2$
$2(sId - c(1 - \delta)Ic)$.
Lemma 6.1. If $\Lambda \geq 0$,
1. if $\Delta 1 < 0$, then $T* = T*$
11.

2. if $\Delta 1 \geq 0$, then $T* = T*$
12.
Proof. If $\Lambda \geq 0$, then $TPL12$ is concave on $T > 0$.
If $\Delta 1 < 0$, Eq. (6.18) implies that TPL'
$12(T) < 0$, and then $TPL12(T)$ is decreasing on $[M1 - N, +\infty)$. It follows from (6.19) that $TPL11$ is increasing on $[t, T*$
11) and decreasing on $[T*$
11,$M1 - N$).
Consequently, $TPL1(T)$ is increasing on $[t, T*$
11) and decreasing on $[T*$
11,$+\infty$). Hence $T* = T*$
11.
If $\Delta 1 \geq 0$, Eq. (6.16) implies that TPL'
$11(T) > 0$, and then $TPL11(T)$ is increasing on $[t,M1 - N)$. It follows from (6.19) that $TPL12$ is increasing on $[M1 - N, T*$
12) and decreasing on $[T*$

12,+∞).
Consequently, $TPL1(T)$ is increasing on $[t, T*$
12) and decreasing on $[T*$
12,+∞). Hence $T* = T*$
12.
Lemma 6.2. If $\Lambda < 0$, then $T* = T*$
11.
Proof. If $\Lambda < 0$, Eq. (6.17) implies that TPL'
12(T) < 0, and the proof is similar to that of Lemma
6.1.
The following result can be developed from Lemma 6.1 and
Lemma 6.2.
Lemma 6.3. When $N \leq M1$,
1. if $\Delta 1 < 0$, then $T* = T*$
11.
2. if $\Delta 1 \geq 0$, then $T* = T*$
12.

Next, let us discuss the case in which $N \geq M1$. When $N \geq$
M1, Eq. (3.4) yields TPL''
13(T) =
−2K
T3 < 0, which implies that $TPL13$ is concave on $T > 0$.
Consequently, $T* = T*$
13.
From the above arguments, we complete the proof of
Theorem 4.1.

IX.   APPENDIX B

It follows from $(3.6)-(3.7)$ that $TPL_{21}(M_2 -$
$N) = TPL_{22}(M_2 - N)$, hence $TPL_2(T)$ is well
defined.
Eqs. $(3.6)-(3.7)$ yield

$$TPL'_{21}(T) = -[D^2 \frac{\frac{p}{(1-p)^2}}{x}(h + v_d I_d) + \frac{hD + sDI_d}{2}] + \frac{K}{T^2}, \tag{6.20}$$

$$TPL''_{21}(T) = -\frac{2K}{T^3} < 0, \tag{6.21}$$

$$TPL'_{22}(T) = -[D^2 \frac{\frac{p}{(1-p)^2}}{x}(h + v_d I_d) + \frac{hD + cI_c D}{2}]$$
$$+ \frac{1}{T^2}[K - \frac{D(M_2 - N)^2}{2}(sI_d - cI_c)], \tag{6.22}$$

$$TPL''_{22}(T) = -\frac{2}{T^3}[K - \frac{D(M_2 - N)^2}{2}(sI_d - cI_c)]. \tag{6.23}$$

Eq. (6.21) implies that $TPL_{21}(T)$ is concave on $T > 0$, and Eq. (6.23) implies that $TPL_{22}(T)$ is
concave on $T > 0$ when $K - \frac{D(M_2-N)^2}{2}(sI_d - cI_c) > 0$. Hence, if T_{2j} exists for $j = 1, 2$, then

$$T'_{2j}(T) \begin{cases} > 0, & \text{if } T < T^*_{2j}, \\ = 0, & \text{if } T = T^*_{2j}, \\ < 0, & \text{if } T > T^*_{2j}. \end{cases} \tag{6.24}$$

Let $\Theta = K - \frac{D(M_2-N)^2}{2}(sI_d - cI_c)$.

Lemma 6.4. If $\Theta \geq 0$,
1. if $\Delta 2 < 0$, then $T* = T*$
21.
2. if $\Delta 2 \geq 0$, then $T* = T*$
22.
Proof. If $\Theta \geq 0$, then $TPL22$ is concave on $T > 0$.
If $\Delta 2 < 0$, Eq. (6.23) implies that TPL'
22(T) < 0, and then $TPL22(T)$ is decreasing on $[M2 -$
$N,+∞)$. It follows from (6.24) that $TPL21$ is increasing on
$[t, T*$
21) and decreasing on $[T*$

21,M2 − N).
Consequently, $TPL2(T)$ is increasing on $[t, T*$
21) and decreasing on $[T*$
21,+∞). Hence $T* = T*$
21.
If $\Delta 2 \geq 0$, Eq. (6.21) implies that TPL'
21(T) > 0, and then $TPL21(T)$ is increasing on $[t,M2 -$
$N)$. It follows from (6.24) that $TPL22$ is increasing on $[M2 -$
$N, T*$
12) and decreasing on $[T*$
22,+∞).

Consequently, $TPL2(T)$ is increasing on $[t, T*$
22) and decreasing on $[T*$
22,$+\infty$). Hence $T* = T*$
22.

Lemma 6.5. If $\Theta < 0$, then $T* = T*$
21.

Proof. If $\Theta < 0$, Eq. (6.22) implies that TPL'
22$(T) < 0$, and the proof is similar to that of Lemma 6.4.

The following result can be developed from Lemma 6.4 and Lemma 6.5.

Lemma 6.6. When $N \leq M2$,

1. if $\Delta 2 < 0$, then $T* = T*$
21.

2. if $\Delta 2 \geq 0$, then $T* = T*$
22.

Next, let us discuss the case in which $N \geq M2$. When $N \geq M2$, Eq. (3.8) yields TPL''
23$(T) =$
$-2KT3 < 0$, which implies that $TPL23$ is concave on $T > 0$.
Consequently, $T* = T*$
23.

From the above arguments, we complete the proof of Theorem 4.2.

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Impact Of JIT On Firms' Financial Performance: Some Iranian Evidence

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Abstract- **Financial performance is the main objective of profit seeking companies. The implementation of the just-in-time philosophy will have a profound impact on financial performance. The objective of this article is to help establish the extent to which just-in-time may affect to Iranian companies' financial performance. The result of the study shows that the implementation of just-in-time will cause more strength not only in non-financial aspect but in financial aspect too. Further the result reveals that there is a hug gap between the actual levels of implementing just-in-time as well the expected level.**

Key words: Just-in-time, Financial performance, and Iran

I. INTRODUCTION

Under intensive global competitive pressure, most companies around the world have applied innovative thinking to management and begun to examine technology that can lead to improved manufacturing flexibility, product quality and production cost (Brox and Fader, 2002 and Chu and Shih, 1992). In competitive world markets most manufacturing companies have learned that survival rests on a commitment to continual process, and product improvement compete with high quality of product and low price (Salehi and Valizadeh, 2007). In today's rapidly changing marketplace a company must deliver low cost together with high quality and reliability of product to ensure retaining an adequate market share.

Advancements in information technology (IT) have enabled companies to use computers to carry out their activities that were previously performed manually.

Therefore, improvements in the information technology have facilitated the use of cost and management accounting procedures. On the other hand, most of the companies have started to apply just-in-time (JIT) production system as a tool to become competitive. Companies applying JIT production system aim at minimizing all inventory levels and delivering the goods and services to customers on time. In this sense, use of IT has also helped companies apply JIT production system more effectively. The aim of this paper is to identify how improvements in JIT have influenced

financial performance of Iranian manufacturing companies. Time-based competition is one of the most important recent trends in a business environment and JIT philosophy plays an increasingly prominent role in the modern industrialised era (Fullerton et al, 2003). JIT is an all-inclusive organisational philosophy designed to achieve high volume production using minimum inventory at the right time and based on planned elimination of all waste and continuous improvement (Fullerton and McWatters, 2001; Peng and Chuan, 2001; and Oral et al, 2003). JIT's focus on excellence through continuous improvement requires a performance measurement system that evaluates the changes in quality, setup times, defects, rework and throughput times (Fullerton and McWatters, 2002).

JIT should be linked to critical success factors at all organisational levels (Fullerton and McWatters, 2002). JIT philosophy of manufacturing management has received widespread attention over the last few decades and still plays a prominent role in the modern manufacturing era. JIT is also known as 'Toyota Production System' (TPS) and under the label 'lean manufacturing', the adoption of JIT become more widespread (Swamidass, 2007). One of the main priorities of JIT production is to understand JIT philosophy and its elements.

II. JIT: THE CONCEPT AND DEFINITION

Abrahamson (1996 and 1997) described management philosophies such as JIT, Total Quality Management (TQM), quality circles, business process re-engineering, management by objectives, job enrichment, empowerment and downsizing as management 'fashions'. Before Ford, most automobile plants fashion by master craftsmen and after Ford, the span of worker control was condensed, production was rationalised, efficiency soared and the world was put on wheels Krafcik, 1988). Krafcik (1988) further argued that many of Ford's principles are still valid and form the basis of Toyota Production System (TPS), which is later called just-in-time (JIT) manufacturing. JIT manufacturing has received widespread attention and has been widely reported on over the last few decades. The first article on JIT manufacturing was published in late 1970s (Keller and Kazazi, 1993). The JIT concept was founded in 1937 by Kiichiro Toyoda, whose basic thought was "just make what is needed in time, but not make too much" (Toyoda, 1987). The basic idea of JIT was brought in to high level of sophistication by Taiichi Ohno at the Toyota Motor Company in Japan and the JIT approach was first called Toyota Production System (Sohal, et al, 1988).

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JIT manufacturing is a philosophy of operations management based on planned elimination of all waste for the purpose of cost reduction and continuous improvement of quality, productivity and customer satisfaction. Ohno (1982) defines JIT as:

Having the right part at precisely the right time, and in the right quantity, to go into assembly"

Schonberger (1982) defines JIT as:

"Produce and deliver finished goods just-in-time to be sold, sub assemblies just-in-time to be assembled into finished goods, fabricated parts just-in-time to go into the sub assemblies and purchased materials just-in-time to be transformed into fabricated parts."

Chakravorty and Atwater (1995) claims:

"The core of JIT philosophy is continuous improvement through the elimination of waste."

APICS (1992) provides a broad definition of JIT manufacturing as:

"A philosophy that encompasses the successful execution of all manufacturing activities required to produce a final product, from design engineering to delivery and including all stages of conversion from raw material onwards. The primary elements include having only the required inventory when needed; to improve quality to zero defects; to reduce lead time by reducing setup times, queue lengths and lot sizes; to incrementally revise the operations themselves; and to accomplish these things at a minimum cost."

Voss and Robinson (1987) developed comprehensive definition to JIT concept as:

"A production methodology which aims to improve overall productivity through the elimination of waste and which leads to improved quality. In the manufacturing/assembly process JIT provides for the cost-effective production and delivery of only the necessary quality parts, in the right quantity, at the right time and place, while using a minimum of facilities, equipment, materials and human resources. JIT is dependent on the balance between the stability of the users' scheduled requirements and the suppliers' manufacturing flexibility. It is accomplished through the application of specific techniques which require total employee involvement."

More recently, Heizer and Render (2004) defined JIT as:

"A philosophy of continuous and forced problem solving that supports lean production, driven by the 'pull' of the customer's order."

JIT involves a series of operating concepts and techniques that identifies operational problems systematically, finds solutions and corrects problems so that defects are never sent to the next process. The main objective of JIT is to supply the right materials at the right time in the right amount at each step of the production process in the most economical manner. It covers all activities of the production system, from the design of the product through production to delivery to the customer (White and Ruch, 1990).

III. Advantages of JIT

The advantages of the JIT philosophy are many. Giunipero et al, (2005) say that JIT has led to several benefits which include lower production cost, higher and faster throughputs, better product quality, reduced inventory costs, and shorter lead times in purchasing. According to an American study of U.S. Manufactures, companies can expect improved performance in lead times, quality levels, labour productivity, employee relations, inventory levels and manufacturing costs (White, Pearson, and Wilson, 1999).

Fullerton and McWatters (2001) summarised benefits in to five categories: quality benefits, time-based benefits, employee flexibility, accounting simplification and firm profitability. The increase in performance is usually attributable to a decrease in inventory levels, smoother production flow, lower storage cost and ultimately a decrease in average cost per unit (Hall, 1989). Callen et al. (2000) reported that JIT plants have significantly less WIP than non-JIT plants. JIT plants also store fewer finished products and have lower variable and total costs than the non-JIT equivalent. Callen and co-workers further found that JIT plants are significantly more profitable than non-JIT plants, but are neither successful at minimising WIP and costs nor maximising profits.

It is possible to observe that traditional performance measurement system is inconsistent with JIT system benefiting from technological innovations at a maximum level and also that it prevents or hides broad-based effectiveness of new production methods. In this sense, the restrictions of traditional measurement system in JIT environment might be listed as follows:

a) Continuous development in production process is basic element in JIT manufacturing environment. To reach this aim easily, it's intended to make flow of production possible with minimal parties and decreasing stock levels to a minimum. Yet, production and productivity measures of traditional understanding have reported that the productivity is low when small-lot production is made (Drury, 1990). For this reason, traditional accounting system suggests increasing batch capacity rather than decreasing lot size, which leads to raising stock levels, long supply process, increasing cost and declining customer satisfaction (Mcnair, Lynch and Cross, 1990).

b) As in standard costing, appropriate operational control of traditional accounting system cannot be carried out in today's production environment (Allott, 2000; Cheatham and Cheatham: 1996; Ezzamel, 1992). Besides, due to the reliability and consistency of manufacturing processes in JIT environment, deviations do not exist or exist in quite low level and it also leads to less use of deviation analyses.

c) JIT manufacturing system changes will bring about changes in information requirements (Upton, 1998). As it is known, normally traditional performance reporting is prepared monthly or weekly and cannot detect on time real reasons of processes that are not realized as expected. Yet, in JIT production system there is a possibility of short

production cycle, so it requires information for the problems coming out in accordance with one-day or "real time" principal.

Green et al. (1991), Clode (1993), Flynn et al. (1995), McLachlin (1997), Sakakibara et al. (1997), Wafa and Yasin (1998), Callen et al. (2000), Fullerton and McWatters (2001), White and Prybutoc (2001), and Ahmad et al., (2004) presented potential benefits and performance improvements achieved through JIT implementation. The summary of main benefits of JIT is listed below:

- reduced process time, setup time and lead time;
- reduced raw material, WIP and finished goods inventory levels and lot size;
- improved machinery and reduced machine breakdowns and downtimes;
- minimised space requirement;
- improved flow of products;
- lowered production costs;
- simplified production processes;
- improved quality;
- improved flexibility, multifunctional ability, motivation and problem solving capability of employees;
- increased productivity and performance;
- improved consistency of production scheduling; and
- increased emphasis on supplier integration

IV.   PERFORMANCE MEASUREMENT

Many factors contribute to why many firms prefer non-financial performance measures. In view of this, some researchers suggest that the preference for these measures on a large scale is related to the enterprises operational and competitive structure (Said, et. al., 2003), others suggest that this preference can be related to the JIT structure (Hoque, et al, 2001). Callen, et al, (2005), Itner and Larcker (1995) examined the use of BSC together with the aforementioned modern techniques and argued that enterprises using the JIT and non-financial (production performance) measurements together have reached a higher performance than other firms without these measurements. Perera, Harrison and Poole (1997) argue that the use of non-financial measures show significant associations with customer focused strategy, but not the link to organizational performance.

From the nineteenth century to the 1920s, there was a huge boom in innovation of financial and management accounting techniques. Accounting is the process of identifying, measuring and communicating economic information to make relevant judgements and decisions by users of the information. Literature concerning performance measurement can be divided into two main phases (Ghalayini and Noble, 1996). The phase from late 1880s to 1980 emphasised on financial measures and the second phase started in the late 1980s as a result of changes in the world market. Traditional accounting systems are classified in to two groups, according to the users of the information:

- Financial accounting systems (external users),
- Management accounting systems (internal users)

So, one of the important performance measure is JIT. From recent years on, some manufacturing businesses have tried to eliminate the need to hold stocks by adopting JIT (Atrill and McLaney, 2002). The essence of JIT philosophy is to eliminate waste.

Managers try to (1) reduce the time that products spend in the production process and (2) eliminate the time that products spend on activities that do not add value (Horngren et al, 2002). JIT refers to a system in which materials arrive at the right place exactly as they are needed. Demand drives the procurement of materials and production of the product. A key element of JIT is just-in-time production. JIT production is a system in which each component on a production line is produced immediately as needed by the next step in the production line (Horngren et al, 2002). In other words, in a JIT setting, demand triggers each step of the production process, starting with customer demand for a finished product at the end of the process and working all the way back to the demand for direct material at the beginning of the process.

Kaplan (1984) mentioned that "virtually all the practices employed by firms today had been developed by 1925". Kaplan argued that despite considerable changes in the nature of organisations and the dimensions of competition after 1920s, there has been little innovation including discounted cash flow and residual income in the cost accounting and management control systems. Kaplan further stated that the standardisation of internal and external reporting to regulatory bodies is a reason for slow innovation in MAS. Hence, until late 1980s, performance measures based on MAS played a vital role in financial performance measurement. These financial measures focused on profits, productivity, return on investment, standard cost variance analysis, turnover, current ratio, and liquidity ratio. Performance measurement is a critical aspect of management accounting systems within a JIT environment (Upton, 1998). However, the use of efficiency variances may encourage buffer stocks rather than demand and also, price variance may lead to purchase of low quality materials (Upton, 1998).

Various studies have considered productivity and profitability as the major indicators in financial performance measures. Productivity may be simply defined as the ratio of output to inputs. It is concerned with the efficient utilisation of resources (inputs) in producing goods and/or services (output) (Sumanth, 1984). The most important characteristics of productivity measures are its ability to reveal factors contributing to changes of productivity, to detect factor substitutions, to determine relative contribution of various inputs and outputs and to distinguish price effects from changes in physical productivity (Misterek *et al.*, 1992). However, Bond (1999) categorised process time and cost of waste as determinants of productivity, which are non-financial operational performance measures. Mistry (2005) found that, though JIT has been widely implemented, interest in documenting its impact on financial performance and productivity was generated during last few decades. For example, Inman and Mehra (1993) established the link between JIT benefits and bottom line financial measures.

Olsen (2004, cited in Swamidass, 2007) is stated that "lean/JIT firms tend to have better return on equity", since lean/JIT is associated with low inventories. However, according to Fullerton and McWatters, (2002), the use of financial performance measures under the present competitive market conditions appears unsustainable due to various reasons. Therefore, performance measurement system of a corporate using JIT production system should support basic variations such as increasing product or service quality, continuous development and reducing the losses (Hendricks, 1994; Fullerton, 2003).

V.   RESEARCH PROBLEM

According to review of literature the research problems arise from two sides namely, first according to Kazazi and Keller (1994) little research has been reported on the quantitative tangible and intangible benefits of JIT implementation. So, in this area just little study has done in well developed countries and developing countries suffer the lack of research in this aspect. Second, according to the Swamidass (2007), organisations experienced various benefits by implementing JIT based on twin foundations of waste reduction and continuous improvement. Womack and Jones, 1996, Brox and Fader, 1997, Voss and Blackmon, 1998 and Standard and Davis, 2001 identified the philosophy underlying JIT is 'continuous improvement' by implementing 'pull production' and 'eliminating all kind of wastes'. Therefore, it is essential to pay attention to this very vital aspect in developing county such as Iran.

VI.   RESEARCH OBJECTIVE

A pivotal question in the survey was to determine if companies had introduced the JIT philosophy. JIT is usually considered as a philosophy to eliminate waste, rather than as a set of techniques (Cobb, 1993). So, it will affect to financial performance. The main objective of the study is in which extend implementation of JIT will affects on financial performance.

VII.   REVIEW OF LITERATURE

The philosophy emphasizes excellence in eliminating waste through the reorganization of manufacturing processes (Hall, 1983). When a manufacturer uses the JIT strategy to purchase raw material or parts, the terminology is "a JIT purchasing system" (Lee & Wellan, 1993). When Just-In-Time is applied to a purchasing strategy it becomes about frequent releases and deliveries; allowing for the reduction of buffer inventories in the buying plant. This is due to the confidence in the supplier's delivery commitment (Schonberger & Gilbert, 1983). The research study of Swamidass (2007) confirmed that in industries using JIT practices, top performing firms have greater success with inventory reduction than bottom performers and concluded that in the JIT era, inventory is associated with overall firm performance. Laugen et al, (2005) found that high and low performing organisations differ in terms of implementation "width" and "depth" of action programmes. Moreover, Laugen et al, (2005) identified that high performing organisations implement more concepts compared to low

performers and more committed to continue implementing the programmes even if the results are long term. The authors further found the combination of process focus, pull production, equipment productivity and environmental capability has a significant positive effect on performance. Gonzalez-Benito, (2002) do not agree that JIT purchasing should be explained as a simple set of practices but rather that it is understood to be a philosophySchonberger & Gilbert (1983) have developed a list of characteristics describing the JIT purchasing environment.

VIII.   RESEARCH METHODOLOGY

The participants of the study were the top managers of listed companies in Tehran Stock Exchange (TSE). In this study mangers of manufacturing were chosen. Randomly130 questionnaires were distributed among the managers. Out of 130 questionnaires, only 70 usable questionnaires were returned by managers. The returned questionnaires resulted in a response rate of 53.85 percent.

In order to gathering usable data a three- part questionnaire was designed according to the study of Dixon et al, (1990), Gupta and Somers (1996), and Ahmand, Mehra, and Pletcher (2004). The questionnaire contained questions that asked the participants to indicate the level of emphasis placed by their factors on certain JIT elements.

IX.   THE RESEARCH HYPOTHESES

According to the research problems and objective as well, the following hypotheses were postulated in the study

1. The financial companies' performance increases by the application of JIT.
2. The growth companies' performance is guaranteed by the application of JIT.
3. The activities related to the evaluation of Iranian companies' performances will have a great efficiency by the application of JIT system.
4. There is a difference between the existing situations of the companies in the application of the performance evaluation and the favorable situation regarding to JIT.

X.   TESTING OF THE HYPOTHESES

The regression analysis:

The regression analysis has had a close relation with the correlation coefficient and generally it is used in the studies simultaneously which makes it possible for the researcher to predict the changes of the dependent variant via the independent variant. If the correlation between the variants is stronger, the prediction will be more accurate. Their difference is that the regression follows the prediction while the correlation coefficient just examines the value of the dependence of the two variants. But in data analysis they are used as a supplementary for each other.

Hypothesis 1: The financial performance of the companies increases by the application of JIT.

In Table 1 the summary of the regression calculations performing between the dependent variant of the financial performance with JIT has been noted:

Table 1. The result of testing first hypothesis

Variables	Correlation Coefficient (r)	Determination Coefficient (r^2)	F	p - value	N	width (a)	Slope (b)
Financial function and JIT	0.671	0.45	55.552	0.000	70	0.585	0.767

It is noticed that the correlation coefficient between these two variants is 0.671 which shows an intense correlation. As this coefficient is positive we can say that their changes will be at the same direction. In other word, the financial performance of the companies increases by the application of JIT. The determination coefficient is 0.45 which means that 0.45 of the dispersion of the dependant variables (financial performance) is justified by the regression pattern. The regression line for this equation

is: Y=0.585+0.767x

Now we want to see that whether this extracted correlation in the above example is extendable into research society or not. We can define zero and one assumptions like this:

H0: ρ=0

H1: ρ≠0

Here ρ is the correlation coefficient between the two variables.

Considering the P-value=0.000 which is noted in the above table, we can say that assuming the angle

coefficient to be zero or assuming the inexistence of the correlation between these two variants in significance level of 5percent is rejected, therefore we can say that the financial performance increases by the application of JIT.

Hypothesis 2: The growth performance of the companies is guaranteed by the application of JIT.

In the table below the summary of the regression calculations performing between the dependent variant of the growth performance with JIT has been noted

Table 2. The results of second hypothesis

Variables	Correlation Coefficient (r)	Determination Coefficient (r^2)	F	Error level (p)	Number (n)	width (a)	Slope (b)
Growth function and JIT	0.796	0.639	120.33	0.000	70	0.392	0.749

It is noticed that the correlation coefficient between these two variables is 0.796 which shows an intense correlation. As this coefficient is positive we can say that their changes will be at the same direction. In other words the growth performance of the companies increases by the application of JIT.

The determination coefficient is 0.639 which means that 0.639 of the dispersion of the dependant variant (growth performance) is justified by the regression pattern. The regression line for this equation is:

Y= 0.392 + 0.749x

In this equation y is the dependent variant (growth performance) and x is the independent variable (JIT).

Now we want to see that whether this extracted correlation in the above example is extendable into research society or not. It may be defined the null and research hypothesis as following respectively.

H0: ρ=0

H1: ρ≠0

Here ρ is the correlation coefficient between the two variants.

Considering the P-value=0.000 which is noted in the above table, we can say that assuming the angle coefficient to be zero or assuming the inexistence of the correlation between these two variants in significance level of 5percent is rejected, therefore we can say that the growth performance increases by the application of JIT.

Hypothesis 3: The activities related to the evaluation of Iranian companies' performances will have a great efficiency by the application of JIT system.

In the table below the summary of the regression calculations performing between the dependent variant of the evaluation of the performance with JIT has been noted

Table 3. The result of testing third hypothesis

Variables	Correlation Coefficient (r)	Determination Coefficient (r^2)	F	Error level (p)	Number (n)	width (a)	Slope (b)
Evaluation of the function _____ JIT	0.742	0.556	83.345	0.000	70	0.784	0.67

It is noticed that the correlation coefficient between these two variables is 0.742 which shows an intense correlation. As this coefficient is positive we can say that their changes will be at the same direction. In other words the growth performance of the companies increases by the application of JIT.

The determination coefficient is 0.556 which means that 0.556 of the dispersion of the dependant variant (evaluation of the performance) is justified by the regression pattern. The regression line for this equation is:

$Y= 0.784 + 0.67x$

In this equation y is the dependent variant (evaluation of the performance) and x is the independent variables (JIT).

Now we want to see that whether this extracted correlation in the above example is extendable into research society or not. It may define the null hypothesis and research hypothesis as following:

$H0: \rho=0$

$H1: \rho \neq 0$

Here ρ is the correlation coefficient between the two variables.

Considering the P-value=0.000 which is noted in the above table, we can say that assuming the angle coefficient to be null or hypothesis the inexistence of the correlation between these two variables in significance level of 5 percent is rejected, therefore we can say that The activities related to the evaluation of Iranian companies' performances will have a great efficiency by the application of JIT system.

Hypothesis 4: There is a difference between the existing situations of the companies in the application of the performance evaluation and the favorable situation.

For examining the above hypothesis the non-parametric test, Wilcox on Signed Ranks Test, has been used. The summary of performing this test is noted in the table below

Table 4. the results of testing fourth hypothesis

		N	Mean Rank	RanksSum of Ranks
Ideal situation of JIT	Negative Ranks Positive Ranks Ties Total	55(a) 10(b) 5(c) 70	35.00 22.00	1925.00 220.00

a Ideal situation jit<JIT
b Ideal situation jit>JIT
c Ideal situation jit=JIT
Test Statistics (b)

	Ideal situation jit-JIT
Z Asymp. Sig.(2-tailed)	-5.580(a) .000

a Based on positive ranks
b Wilcox on Signed Ranks Test

Considering the P-value=0.000 we can conclude in significance level of 5 percent, assuming the inexistence of the difference between the existing situation of Iranian companies in the application of the JIT and the favorable situation is rejected, therefore we can say that there is a great gap between the existing situation of Iranian companies in application of JIT and the favorable situation.

XI.   CONCLUION

The basic idea of JIT is, as Schonberger (1982) maintains, a simple one: produce and deliver finished goods just in time to be sold, sub-assemblies just in time to be assembled into finished goods, fabricated parts just in time to go into the subassemblies and purchased materials just in time to be transformed into fabricated parts.

JIT as a management philosophy has engendered great interest internationally since the early 1980s. JIT was first implemented by Toyota Motor Company in the early 1970s and has since spread to other Japanese companies and globally. It is recognised as one factor contributing to Japan's reputation for superior quality and growth in productivity (Keller and Kazazi, 1993).

The findings from the informal discussions confirmed the key issues elicited from literature review (White and Ruch, 1990, Billesback et al., 1991, Funk, 1995 and White and Prybutoc, 2001) that there are no universally accepted JIT techniques and performance measures. They appear to vary from plant to plant, organisation to organisation, industry to industry and also from culture to culture.The results of this research showed that in Iran like other countries, the application of JIT increases the financial performance of the companies. According to the researchers, this method is one of the best methods for decreasing the expense and increasing the efficiency of the company. Another disturbance of director generals is the increase of the companies' growth. In this research the results of the second hypothesis showed that the application of the JIT system increases the companies' growth and spontaneously guarantees the long durability of the companies. The results of this research also showed that the application of JIT system causes the evaluation of the performance in different directorial levels and eventually it will increase the directors' responsibility and replication.

According to the researchers, the increase of the directors' replication will cause the companies to have less declination in medium-term and long-term programs and also if there is any declination in fundamental goals, it will be identified and corrected at the shortest time. With all the guarantees the JIT system has for Iranian companies, the results of the fourth hypothesis showed that there is a great gap between the existing situation and the ideal situation and JIT system is performed imperfectly in Iranian companies: Eventually the researchers conclude, although the application of the JIT system in Iran increases the financial and non financial performance of the companies, but because of the weakness in performing the JIT, they can not benefit from it. The researchers strongly suggest that the barriers of performing the JIT system must be identified and removed as soon as possible, so the Iranian companies increase their financial performances.

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The Management And Communication Policies Using Electronic Govern (E-Gov)

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Abstract- **This paper is about e-gov program like as management and communication policies from Rio Grande do Sul state govern. This technology innovation and its referential elements are engage in to find new ways of communication, information and management in a different form to do these process. When different fields are involved, the technology paradigm can bring the answers to regional development and from population engage on actuality changes. The results are support from description and methodological analyses and the research is bigger than this and utilized secondary dates. The emphasis of the subject of technology innovation is the determinate element for the competition, for to be introduce new govern competences and to main e-gov like vital system in organization changes.**

Keywords: electronic govern; technological innovation; public management; communication.

I. INTRODUCTION

In actually world scene before many changes from globalization and dynamic context the Govern and the community are engage to find new communication ways, information, management, technology, knowledge and also make differences. So, the organized and for promote the citizen social movements continued to be great pressure Govern to see realized their demands and to do more efficient and need the public services. We live on society that the complex changes and transformations caused a new way to concept the knowledge. The information development has a privilege space in day-by-day, main from the communication ways. Many people say that we although live in an information society and the development from information and communications technology process (ICTs) are not rest ringed for some few persons.

To understand and to explicate how the presences of these technologies can make the development of the region; how can moves debates about democratic govern and management performance; have social relationships an differences ways to do; to
contribute with diversity, with transparency, with participations and interactivity an also like a way to satisfactory and be more satisfaction results; is a consequence from those changes, like says Putnam (1996), because these innovations goals, so many time, can be

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guaranteed not only the regional interests, for the public institutions desperate.

The governs take actions that can be sustainable and support from management policies. This context have bring out public management policy and uses of E-gov like a model of information and communication technologies and like a political tool to promote the participation and the integration, that are so necessary in those process. So, analyzing the Rio Grande do Sul state can be know with this management tool how to promote citizen and how to promote that people add to councils from regional development (COREDES) and how to another members of population can be participate and contribute in a public transparency process.

That was seemed that is possible to study the E-gov contribution to know about the democratic institutions performance, finding reasons of this kind way to management in new quality built model. To add the change of administration and technological systems with new attitude conquest on city and glamour virtual life of media and outdoors we possible escape from dual and traditional problems, that we were educated and formed to live in those spaces in continued built. To find security and creditability relation with public interests and relationship with a large time vision is fundamental important to be better the image and values from govern organization. To ingress in this wave of information and communications technology process (ICTs) is a way to find how to be prepare for comprehension in the real world where the extern information collaborate for building knowledge and to have a well done head. To understand the importance is to understand the conflict that is inside and between societies, and the way like citizens can be organized and make interventions in theirs social and culture life

The research methodological has electronic govern (E-gov) like the first subject and consist in accept this like a communication process, thinking like an articulation in the scientific way that involves many stages. So, the goals of this research is to be descriptive, like says Collis and Hussey (2005, p 24) to know the phenomenon beehive. This paper identifies the in formations and the characteristics of de problem or of research question, 3
and for this reason can to centre pieces of secondary sources in a pos-doc research project about the E-gov like the main subject.

This study has a description character and is being realized in Rio Grande do Sul' Govern, since 2007 until 2010. The actual govern (2010) implements and intend to develop on state a bigger economy development and a growing with programs and technologies of communication and

information like a way to be possible and coherent the contemporaneity the digital inclusion. Today, Rio Grande do Sul state is difference character when analyzing this kind of even. Since 1953, how can shows a govern web (2010) was done a lot of experiences to introduce the plan like an instrument to form people can be more easy the actions of govern. But, just since 2007, the state secretary from make plans and management called Secretaria do Planejamento e Gestão - SEPLAG had began with put a new vision about the plan and be this part of govern be integrate with management like special way, trying to implement the transformers actions on public administration.

Some problems are historic and structural, like the problems showed in Govern plan, so have replay and became harder for long time and ask for the new solutions can be a new way to management. Then, the information society came to be a great investment that aim govern new goals, like as, sources to introduce too. Have a frame where new cyber technologies are integrate to the (Lemos, 2002), relational for communication and information for people and community, became, today, a vital source to make the relation between urban spaces and social relations. One of the manners that govern uses like says Lemos (2007) is the elaboration of door in web that can join information, services and can be more approached to citizen and his public actives.

To realize the value of public space can turn possible for utilizing new Technologies, growing the transparency, can integrate and grow the contacts of members to apply the strategic none, like as need competitive differential that is the responsible for success of public communication policy. So, when could be seeing the perception and the communication access for the door: "Very Easy" from the govern Rio Grande do Sul state together of participate population of COREDES from metropolitan region and the cities of Vale dos Sinos we can take better relationships from management relations and govern policy. This tool of management and communication of electronic govern (2007-2010), that 4

have social values and special positions in political arena. The instrument can be important piece for support political speech and actions on political communication arena. That owned from govern. The political paper of this management and communication program was because real and potential consequences for the function of this political system.

Could be knew that the make function the door depends, in great part, for involved people in the process. Today, the discussion about this subject is frequently in all political ways and different action arena. With the last economic world crisis forced the needs to maintained ethical frames for management of business, the information transparency, social equality and the same level of responsible. The political organization that centres its strategic management, its transparency, near relations from ethical frames and ways to treat its human resources will be more prepared to goals and challenger from global competition and its posture will be recognized like possible to be in good stage on the market, having the best economics and social results.

II.   E-GOV LIKE COMMUNICATION AND INFORMATION EDUCATION AGENT

On the communication, the language resources can promote new forms, instruments and can built, can destroy and built again the new knowledge. The activities of communication are not without annex from other public or private activities of social life. Its influence is recognized together the decision ways of organization structure, with reflex on ideological systems and on the culture from society, its interest and conflicts, consents and politics development. Can be influence also like says Dominique Wolton (1998, p.28), "the communication policy says all that can annex the production and the change of political speeches", on today social relationships. It is vital focus on the subject of communication process. Here, the political communication of a govern program is like a plural system with large grade of advantage democratic and with qualities and commons errors of this kind of system.

So, the orientation for include and exclusion sense of typical information from capitalist system for Gohn (2001), shows the great importance to see and ask for a concept built that can know the new historic synthesis and can find the articulation of this complex field, where the communication aim on the real relation of other arenas. If we focus on 5 political communication and analyzed the management program of govern communication we can find a new stage that permits the understanding about dual knowledge4.

The web site information (2010) is a technological base converge where could be relation tree phenols that are on the born transformer. The first is the converge of technological base that couriers from the fact of process any information form and unique way, the digital form. For digitalization, the computation and communication can approach with the subject. There are so many possibilities to apply the creative, the curiosity and the can to absorbed new way to do for people. The second element is the dynamic of industry and market that can show the fall of computers prices and permits that a growing number of people can buy these machines. Like a consequence of add the first and second elements, the third aspect is the grow or web and the fast large of communication.

The information society is not a fashion way. Each more and more the represent member of changes in society and all theirs aspects. We live in a new aim of technological and economic view, with a great potential for promote the integration and the interaction, reduced the distant between people, growing the information level. But can do more and more social differences and show the development conditions. In Brazil, like says the Communications Ministry (2010), is urgent fast the process f articulation of national program for all information society.

Each more efficient and focus for services prostration of information to people, the great contribution that Technologies of information and communication can be for the relationship between govern and citizen, including private arena in its management process. Founded in this use from ways and digital methods can show information and

communication technologic benefices of efficacy, responsible and transparency of govern.

In a global world the economic transition are founded on net with high velocity and this structure is today the strategic for most countries. This context is priority for the development e for the implantation of web of new generation in the country. This Project needs advantage and safety communications for using high velocity circles, with great

4 The dual knowledge for Morin happens for similarities. The knowledge is analogy from the same that detecs and uses similarities to identify the objects or phenomens that concepts. The multiply ways from to know the analogies are aim for all activities and all thoughs, but the spirit is not for the analogy: the goal is the same action and to simulate the real spirit for built mental analogy, to same the real (MORIN, 1999, p.169).

the digital web, including promotion actives, new solutions for attend in web for special needs in web.

III.   E-GOV BUILDING MANAGEMENT POLICY

Today, the market is higher competitive and extremely exigent, this fact moves all public and private organizations to find new kinds of make a difference, trying to investment on management of theirs sources, on compromises with their audience and on organizational credibility. So, the management appears to be stronger the relationships between enterprise and strategic client, being vital for the execution of a good management.

The compromises with a social transparency is the focus and a great importance for politic management, like says Chiavenato (1999, p.121), "[...] the duty grade that one organization shows for the actions that take care and better the well fair of society is when it finds to reach its own interests". The adoction of policy of comunicacion and information technologies appears like a competitive ando is totaly indispensable for survivor and can 7

be more credibility and best view image, things that are important for the stronger values of transparency and reputation.

In the 90's the public management is on top in world scene, because the adoption of Better Ways to Do Codes. In Brazil isn't different. The management is a system that the using tools and instrument (law, regulations and commercial practices) is important thing to do and aims to share different interests from all people that relationship with enterprise, like as controllers, managers, auditors, councils and stakeholders. So, adoption of management policy for a region is the way to use transparency, ethic, human rights, responsibility for products and services, environmental care and protection and compromises with sustainable development.

Information and communication technologies integration between different govern sectors presupposes the built of informational structures from state. This fact may be observed if the state wants the qualify exercise of informational citizen. So, its necessary more than technological dimension, useful called like a digital inclusion. The Govern needs to incentive all mechanisms of

management to realized policies and informational govern management. That means to produce and disponibilizing subjects that can be better conditions to do exercise from information, accountability and transparency. That is a way to produce informational intercession between civil societies and govern for control of state in a democracy.

The number of Brazilian citizen that has access to information society is low and the real conditions to it are growing either. The way to resolution this problem, according Diniz (2009) for have a real e-gov must be guarantee the social contract. So, it is very important realized studies for efficient manners for all population access the tools and necessary structures for a establish sustainable management. The trying to regulate public power interventions in the web nets and technological and financial restrictions can not diminish the optimism from Brazilian public managers.

The reality is not so different. According Amadeu (2009), the virtual process of cities in actually society's shows that warriors about the game of CIBER cities and the struggle against social exclude. There is not enough for the Govern just offers information and digital services to the citizen. Govern needs management policy of this question with 8

clear conceptions, low costs, private partnerships and an integrate environmental. We believe that the proposal must be amply for guarantee a govern plan with continuity for the digital including and the growing technology through bigger offers of services.

IV.   O E-GOV LIKE COMMUNICATION AND POLITIC ACCELERATION INSTRUMENT

The electronic govern like subject born in a many approaches arenas as social and technological ideas. These arenas could not do an isolate approach because the reunion of the elements that shows the relevance and ways to understand the subject. Lot of definitions for the term are founding in literature, some uses electronic govern like modern agent from social relationships, others use like a way to connect the state with one more product from capitalism.

There is a great discussion about operational concepts for follow subjects: govern democracy, state, suffrage and power for one side and bits, nets, CIBER space, artificial intelligence, virtual reality for other side. They are consolidating in a big target, on sense to understand the limits of electronic govern. In the Federal Govern of Brazil web site the information and communication technologies are the instruments for a sustainable development from these tools, like a form that can be better the services and put for all the vital information for the citizens.

These technologies are public administration responsibilities that have the grown of efficient level and govern transparency. For the web site the adoption of electronic ways to do govern services has exigencies that sites and doors are developing and eminence for them and became easy. The new technologies of information represent one new stage of economic organization and from organization of society. According Castells (2002, p.459) these technologies are a real virtuality. In this context with use of

web appears the power of production of knowledge using each time more and more the information.

A new person society has been appears, like a society of people and of net between people, not a society Just of traditional social institutions. A new challenger to called social institution was in land in globalized process and fragmentation of culture primary individuality, the new concept of E-gov of management of organizations demands goal to inclusion and accessibility. A new informational model also needs many regulations and codifications not yet written. The electronic govern is not just door or exclusive from 9

govern power, but shows strategic objectives to be reaching, like as: better quality, security, speed services to the citizen, transparency on govern actions, facilities to Access govern and integration of information to citizen.

The subject electronic govern seems to be like unanimous human history. Since the conference of IADIS Ibero-Americana (WWW/Internet200) showed great changes in course almost compared to Industry Revolution. The way to try to intensify the relationship between citizen and state trespass the proposal, then the big desire is aim enterprises and different circles of public power too. The structure demands of ICT like a great basis for services and creation electronic govern are primordial needs to give better services to society, with low costs. The modern and integrate govern demands either modern and integrate systems with a connection of working ethical, secure and coherent in all public sector.

Morin affirmed that policy is fragmented (1969, p.9), but it is into life of all in society. For Rubim (1994) the media way is more complex and dark, it needs focus messages on politics ideas, even touch life and actual worlds with specific rules that could change sociability matters. The policy is on centre of analyses and incorporates the communication. So, a struggle for make more public the political events and political activities are goals to synchronized for actuality.

The govern of all the world are make more and more investments on political and policies development, on process and trying to establish the rules of ICT, building specific structures for better services and provide better quality of management with low costs. The policies and rules are clearing done for management of information like a fundamental govern connections, on intern way or in society contacts, or on bigger level, investing approach with the rest of the world with others govern. To line the tendencies of today world, the private initiative amply theirs markets and capital for worlds levels of international policies and different governs, we can see introduce of ICT like a canal of needs changes for the success of the globalization process.

V.   END CONSIDERATIONS

The Rio Grande do Sul govern state implanted a digital include program loosing its function for integration between technologies consume and better services for being a sailor 10

of services on web or wants more Technologies each just minority of population has Access. This policy confirms what is written on Information Society Program that treats from access of structure, endurances and policies to do a new basis of new tendency of society, now like an information client.

The offers of services on web from public services are common on the govern doors and had sign the electronic govern in Brazil. So, when we try to value the services qualities, we need to consider real line with consumers needs when ask for services.

The modern democracy is a system where the politic power is a direct result for all members of society, like says Wilson Gomes (1994). To be done, the democracy cans utilized consults and asking people and be legitimated actions in citizen exercise. The power of vote is the main action for the govern or legislation.

The Rio Grande do Sul state govern won election in 2007, and had a politic Project to intend develop actions for stimulate the citizen on state, using like administration tool the called electronic govern5..

The passage to electronic governs and its necessary administration reform is to stronger abilities of actions from population, more than subordinate then for a power (PINHO; INGLESIAS; SOUZA, 2005 apud LEVY, 1999, 367). The electronic govern initiatives are essentials for theirs potentials of democratic management and democratic practices, like one that can be easy the relationships between govern and citizen. The govern administration must be on three arenas: e-public administration, e-public services and e-democracy (Unesco, 2004). The apply of ICT can make better the management.

The great importance aspect from the models is the participation cycle, since the entrance of citizen on the web net until finish of process with multidirectional communication, with new spaces on relationships in society. The elect govern understood these in web net uses and began challengers for great part of population.

The E-gov is like a communication instrument of govern who wants to be different for others. In that way, it aims to tell and view social and participate management using speech to reaching the public opinion. Then, trying to legitimate actions, projects and programs.

5 *For electronic govern (e-gov) we understand an instrument of manangement of govern institutions to aim diminish costs and permits a bigger integration with relationship of users.*

The information strategic E-gov asked for information and services.

The communication ways are accumulators and acceleration of culture and are part of system that was founded on mass communication ways. With natural tendency to develop an information circulation on a mass culture. For Morin (1972, p.20), "the development for culture can permits faster the process." The political communication seems potential to produce events for consume information. So, the approached categories are borders to built public policies in information society with include people. The advantage of changes in

formal institutions and on political behavior like affirms Putman (1996, p.53) eminence this new way to do policy that is amply and autonomy

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Outdated Electronic Resources Of The Utility Management

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Abstract-   A new problem has arisen in library that the number of electronic resources is rapidly increasing and its carrier has changed resources structure of bibliotheca after computers are applied to library. With the development and change of IT, electronic resources are shortening their service-life and corresponding software and hardware are eliminated quickly. Modern library management will face the problem: what will collect or use electronic carriers of books. A read-helped literature reading room may be built up to collect filmcards, floppy disks, video tapes, CD discs, VCD discs etc. and respective equipment. This room will continue to serve for readers in outdated media or those reliant on outdated technology. This paper introduces the status quo of library electronic resources, discusses the concept, management and applications of read-helping equipments so as to improve the management of read-helped literatures and the uses by the readers. This room will open its electronic literature and equipment when a reader needs to continue to use it. In this paper, this is our first time to offer a concept of help read and a read-helped literature reading room built where it has a lot of 5-floppy disks, 3-floppy disks, video tapes, CD discs, VCD discs kept with their equipments if readers want to read some electronic literature. Not only are electronic carries not eliminated nor worn out, but also the operating cost of equipment can decrease if there was no reader.

Keywords:Utility management, Outdated media management, Outdated technology equipment, Service audience, Electronic literature

I.   Introduction

In recent years, the rate of electronic resources in library is higher and higher. Except for the use of online resources, electronic resources can supply literature database by use of local mirror image, backup data disks of online resources and lots of attachments of books and periodicals. These electronic resources are facing the loss of respective equipments and the decline utilization of carrier resources because of rapid development of information technology. Electronic publications need to display under the help of corresponding equipment, but usually some of equipments have been put aside or abandoned. Books or periodicals were kept but not their electronic attachments. Eventually problems on the quality of literatures arise, so we shall discuss this issue below. Current library have probably ceased to use 5-inch and 3-inch floppy disks and also

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eliminated a low-speed 32X CD-ROM drive. Because most of them were based on outdated operating system, such as FAT16 format of the DOS 6.22 operating system, but they could not be compatible with the system of Windows Me, 2000 and other latest version. Audience who needs to read literature has to use some machine to identify them, or library does not retain them in practical significance. A few years ago it was popular to use a CD-R disk to backup data recorders. At that time, in order to reduce costs, some database vendors also made use of data replication in the form of CD-R disk for sales. Even nowadays, some publishers sell their products in the form of DVD-R disk. These burnt disks are prone to be worn away and have difficulty in reading data unlike CD-ROM which is resistance to wear and made by the repressive machinery. When CD-R or CD-ROM data was reading in many DVD drives, there was a message that shows "Please insert disk drive", then the driver stopped reading. In particular, digital film discs can store data in various forms, but they cannot be driven to show audience pictures or let them hear voice without the support of corresponding software. The so-called universal player software exists in reality which can be compatible with VCD discs in previous formats. However, we need to continue to preserve this software. Many CD-ROM version literatures need their own database management system for the management of themselves data. Many literature databases in the form of CD-ROM have their own management system, but they still have some requirements on the compatibility of operating system. Or it can not decode the data of the literature databases themselves. Therefore, compatible software is more important than hardware in a set of read-helped tool. In other words, read-helped literature is based on both hardware and software.

Problem of corresponding equipment to read electronic attachments and backup data still exists, although some libraries have realized that modernized library should consider electronic resources as main preservation. Some libraries had installed a management system of electronic attachments with mirror image to server (Sheng Sui and Wang Wen, 2004) or copied electronic attachments to hard disks in a server (Qin Ping, 2003) via retrieval and download. Each contributing source users of universities in the USA has its own method to format and submit material. To preserve all documents, D-Space maintains a list of supported formats that are to be kept available and readable for the future (Howard Falk, 2003). The method of copying resources to floppy discs or CD-ROMs still consumes a lot of computers' resources. Moreover, hard discs are easier to be broken than the other electronic attachments. The content

stored on RAID is often required to be updated once new attachments are brought in. However, audience seldom makes use of attachments of old books. We copied the courseware of "Computer School" developed by Authorware in 1999 and the file composed of DOS 6.22 from 3 floppy discs for a long-term storage on the hard disk. The courseware has lost autorun.exe, autorun.ico, autorun.txt and main.ico and the file lost all exe files and modify the setup.exe.

II. CONCEPT OF HELP READ

We called a process of helping read as some publications and electronic documents is required to be shown under the help of corresponding tools. What's called read-helping is an abbreviation of helping or supporting reading by tools which include a corresponding special tool and equipment in an indirect role. We call the related tools or equipment as read-helping tool that is along with respective literature. Its role is to help, assist or support to display literature content, so that audience can identify and learn the literature. The read-helping tool is a set of computer, input and output devices such as floppy disk drivers, CD-ROM drivers, printers and tape recorder, video, microfiche film reading device, barcode collector, barcode audience etc. What's more, some external equipment such as floppy disk (CD-ROM) drivers, CD-ROM servers and encryption dog can also be considered as read-helping equipment. If we further extend the range of read-helping, including the tools that can be a bridge as well as the library catalog cards.

Some content of graphic and literature neither can be recognized by naked eyes of normal people nor be read with peoples' hands. The so-called read-helped literature requires tools or equipment to restore or make original literature be acceptable to audience. It is considered as hidden literature such as floppy disks, CD-ROMs, cassettes, videos, and semi-hidden one as films, microfiche. And hidden literature even includes ones that have not to come into library and to catalogue materials, such as various storage devices. With the development of information technology, literature carriers can be made in various materials, such as oracle, bamboo slips and the letter. Literature can also be stored in the format of paintings from Jinding, drawings on the silk, paper or printed volumes of books, films, tapes, floppy disks and CD-ROM drivers, flash disks, hard disks and so on. These literatures show figure and characters fully or partly. Once these hidden literatures are displayed under the help of special tools, it becomes the so-called read-helped literature. Although the word of the read-helping sounds strange, it is not a new term. The management and use of read-helped the literature have been accompanied by the development of libraries, especially in the age when electronic resources occupy main parts in the digital library. Libraries have the responsibilities to collect and preserve the cultural heritage of mankind. To meet audience' demand, the library itself plays an important role in supplying literature collection as well as the managing collections. In the modern library, the utilization of collections and the concept of "zero" increase in collection have replaced the traditional concept on paper literature which are formed for long years (Xu En-yuan,

2005). The more online resource we have, the less paper literature will be used. What's more, to accelerate the use of the library preservation, the ratio of electronic publications tends to offset that of printing publications gradually. In order to improve the utilization of literature, library, in the short period, has to speed up eliminating the old literature, as a result old books and bound periodicals are firstly decreased as fixed assets. However, the similar electronic resources are still restored.

III. PRESENT STATE OF THE PROBLEM

In a long period, the print copy of literature will still take the most important role in the library collection. It is predicted that the print copy will not be eliminated thoroughly. If library only preserves the copy literature without storing its corresponding attachment, the original copy is greatly devalued. In other words, it is not useful and valuable enough for readers. At present, we have not found any indexed thesis which mainly describes people's focus on the management of read-helped literature. What's worse, we can not find out any solution to solving difficulties in reading literature which caused by outdated equipment or technology. Take China National Library as an example, it takes up the leading position both in quality and quantity in the collections of GPUS (Government Publication of the United States) among all libraries in China. However, over 90% of the microfiche have not been put in file and used in the past 20 years. Librarian in international organizations and government publications sector, acquisition and cataloguing department in National Library of China had put those microfiche into literature cabinet according to their original classification number. In fact, librarians did not really read the content of them, and then catalogued them. As a result, a great deal of valuable information was buried, because few of audience bought them and read those resources. (Luo Chen, 2005) Is it worth to storing the literature that is seldom used? Once the usage of collections discussed, libraries that claim to be customers-focused will continuously to cut down those collections with a lower usage. If libraries are rich in electronic resources, they prefer online or electronic resources to print literature. In particular, the journals in print are easily cut down. Libraries that claim to be both customers-focused and usage-focused have not had the ability to excavate the information or repair those outdated equipment. Then, collections with lower usage such as attached CD-ROMs or other corresponding equipment are dumped arbitrarily in many libraries. Without necessary maintenance and preservation, the literature and equipment will be damaged quickly, resulting in being lack of collection.

People are more and more dependent on Internet and online resources, and information technology is developing faster and faster to satisfy audience' demand. As a result, the literature carriers are diversified and the usage cycle of the literature is shortened. For example, computers have no longer been installed 5-inch floppy discs for many years, but there are still piles of floppy discs in stock in the library, which were imported abroad as attachments to original erecting books in the early years. Their main contents are

computers' program or data referred in books. It will be the same with the 3-inch floppy discs. Less and less 3-inch floppy discs can be found, instead there are more and more compact discs. *Instrumentune-up* was the first 5-inch floppy collection in the library which was attached to a book. It was written by S. N. Deming and S. L. Morgan and published by Elservier in 1984. *Dos to OS/2* was the first 3-inch floppy discs collection which included lots of executive programs. It was written by Jay Ranade and Angelo Bobak and published by the McGraw-Hill, Inc. in 1991. At present, our library preserves 350 pieces of 5-inch floppy discs and 1,200 pieces of 3-inch floppy discs. *Win32 API Desktop Reference* was the first CD-ROM discs collection, which was written by James McCord and published by Sams in 1993. It could not be played until relevant program had been installed and original codes were entered. The first VCD collected in our library was *Multimedia Madness*, which was edited by NAUTILUS and published by Sams. Those two publications from Sams can be opened by today's DVD drivers, but the playing speed is very slow and their qualities are poor. Judging from the attachments collected in the early days, they were imported together with the original erecting books. These publications were from Computer Company in the USA with a high price. Take *Management of Economics and Business Strategy* as an example, it was written by Michael Baye R and published by the Social Sciences system Documents Publishing House in November, 2003. A 3-inch floppy disc was attached to this book, in which there were all tables and forms mentioned in the book but not showed to audience. It is of value to exercises on this book. Just as the author wrote in its preface, "It presents experimental materials to help students make economic decision." Some of popular DOS 6.0-based software is attached books that are published in recent years. In early ages, computer drivers and operating system were supplied in the form of floppy discs. Nowadays, CD-ROM discs replace the floppy ones, electronic users' guide instead of the handbook in print. Besides, lots video proceedings and video recorders bought abroad are no longer used. Microfiche were earlier than videos, which collected large quantities of proceedings in old days. From what I discussed above, it draws that a new literature carrier can be replaced by another quickly in a short period except the paper collection which can be read by naked eyes.

Electronic publications need the support of some corresponding equipment to display their contents. But lots of the equipment has been put aside or abandoned. In collection planning and construction, outdated electronic publications were easier to be removed or eliminated. Compared to books and periodicals, their attachments are usually abandoned. At last, problems on quality o f literature spring up. The literature database was no longer available for taking or purchasing backup data discs. Registered webpage took up great number of hits. Some databases have a restriction to the number of users or website servers, and then resources can not be browsed or downloaded. Finally, managers make use of local mirror images to help solve the problem. Although electronic resources plays the most important role in library, its backup data is stored in discs,

CD-ROM discs or RAID which still takes up a lot of room in the library. The spread of management methods would impact the management philosophy of modern library, and cause irretrievable losses of collections. Librarians should pay more attention to strengthen collection management.

IV.   BUILDING READ-HELPED LITERATURE ROOM

In such an information age, library should make sure that audience can have access to all collections preserved, including read-helped literature. At present, if people do not take measures to protect those read-helped literature effectively, manage and maintain read-helping equipment properly, those read-helped literature will be dumped in the near future. At last, information recorded or stored in the read-helped literature will be forgotten. Human history might be incomplete. Whether the library is use-focused or use-and-collection-focused, the preservation of read-helped literature does not contradict to their management thinking. In information society, we should not misunderstand that audience only needs online resources without the need of local collections of electronic resources. Research on read-helped literature and read-helping equipment is necessary. Studies are carried on to explain the definition of read-helped literature, the definition of help-reading equipment, collections and management policies on how to preserve outdated equipment and literature reproduction.

Some libraries have established an old book museum in their new libraries to preserve scare books, rare books and the only existing books that cannot be borrowed. But they may be read and reused through network after digitalization. Some libraries also moved cards counters and directory cards that are useless now to the museum. Collections in library are totally different from that in museum. Resources collected in library are to meet audience' demand. Even though audiences can not have access to original literature, simulated literature should be available for them to use. The action plan in the Florida Center for Library Automation was given out various preservation methods. (Priscilla Caplan, 2004) But migration programs or converting programs themselves are also outdated. Resources digitalization should cover old books, which are an intergraded part of library collections. In a general, they are useful for audience' appreciation and studies. We have an old book *Great Qing Post Maps* published in 1907. After digitalization, it is released on the library homepage NUPT for audience to browse. Customers are able to search for all information available through single access point. The system should allow automatic consulting of the customer organization's own print and electronic holdings (Foachim Schopfel and Facqueline Gillet, 2007).

Building up a read-helped literature reading room is a solution to these problems and is one of the best methods for audience' studies on outdated literature. It is a new type of reading room just like stack books reading room, old books reading room and electronic publication reading room. Its collections consist of outdated attachments, tools and equipment. Specifically speaking, they are 5-inch and 3-inch floppy disks, CD-ROM discs, computers with floppy disk drivers and 32X or low rate CD-ROM driver, small capacity

hardware with the low version of DOS 6.22 operating system, Windows 95/NT4.0 operating system and previous version network systems and various software tools, tape and video recorders, microfiche and microfilm-audience, cards and card counters before 2005. Collections should also have servers for the previous disk, CD-ROM drivers, Novel network management system or other network systems and corresponding adapters to support the service and data recorded. Some CD-ROM servers installed CDNETACCESS which was a kind of management software based on Windows NT4.0. Their greatest strength was able to form a virtual driver that could realize the management on 7×n groups of CD-ROM and set up its own CD documents respectively. But if the CD-R is deposited in drivers of servers for a long-term, it will cause damage to boot sector of CD-R and documents, resulting in a waste disk as well as data losses. Generally speaking, CD-ROM driver is changed into hard discs, copying documents from CD-ROM to hard discs. Each document is equivalent to a CD-ROM. Then we can continue to use CD-ROM driver and CDNETACCESS. When an audience needs to use some outdated attachments of books or periodicals, the corresponding equipment will be open to help reading. As a result, it can not only decrease the cost but also protect attachments. Some outdated contents or program files will be transformed into current format when user read the literature under the help of OPAC. Program files or contents might be copied into text or Word and then transmit them to meet audience' needs. But multimedia cannot be transformed from 8 bits into 16 bits or 32 bits because of its poor quality. We have built a management system for 5-inch and 3-inch floppy disks based on MS SQL Server and the original management system was based on DBASEIII and FoxPro DBMS. The current management system is appropriate for outdated CD-ROM to transfer data and system to other servers.

Because information technology advances the development of library digitalization, the collection scope of digital literature will be wider and wider. The read-helped literature must be equipped with the appropriate read-helping tools, otherwise the read-helping tools could be gradually eliminated and the usage cycle of literature is greatly shortened. Attachments were not as valuable as their mother literature, because read-helped literature was not readable without the help of appropriate equipment. The read-helped literature reading room will play an important role in serving audience. In consideration of technology development of computers and the process from using catalogue cards to search by computers, librarians should make proper planning for the cards cataloguing and management. In case those catalogue cards will put in loose without any management. Each library has lots of cards which were made by librarians to search for resources several years ago, such as citations and index. There are also numerous old collections or collections which do not need to be backtracking into database. Though computers and online services are accessible to the reading room, catalogue card still bring a great deal of convenience to audience. Moreover, there catalogue cards are supplementary to data

inadequacies searched by computers. Above all books in library should be historical, integral and readable.

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VI. BIOGRAPHY

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