Reverse logistics management in pharmaceutical industry management essay



In most of structured interviews, it has clearly emerged that reverse logistics is not the focus and the main purpose of returns is customer satisfaction, surplus return and cleaning of expired medicines.

None of the companies surveyed had to recover medicine for reason of product recall. Expired medicine removal is a legal requirement and operational and strategic policies ensure that medicines are removed before expiry from customers such as hospital, pharmacies and other supply chain members.

Operational level policies are also geared to inspection at the initial point of return where inspection of damage, confirmation of nearing expiry dates etc is carried out. This gate keeping also ensures control of counterfeits if any. The problem of counterfeit medicine however requires other controls as either this type of medicines enter the market through non-channel members. The dishonest retailers obviously would not try to return the counterfeit to the pharmaceutical company anyway.

The returned products are then handled for disposal. Some companies follow a policy of recovering medicines a month or two before expiry and donate the medicine to charitable hospitals for utilization before expiry and thus serve the community, others claim to destroy the medicines.

The general model describing these aspects of pharmaceutical reverse logistics is shown in the Exhibit 3. 1.

Exhibit 3. 1: General model of reverse logistics

Using this model as a guide, our model for reverse logistics investigates the impact of strategic, operational, supply chain orientation, functional integration and an external factor involved in the pharmaceutical reverse logistics and investigates the overall impact on reverse logistics. The model that can be employed to apply for pharmaceutical reverse logistics can be represented as shown below [Mollenkopf et al, 2007]

Exhibit 3. 2 : Model for effective reverse logistics management [Mollenkopf et al, 2007]

The dependent variable in our model is thus effectiveness of reverse logistics while the independent variables that affect RL effectiveness are:

Reasons for Return (Strategic & Operational Policies)

Handling of Returns (Supply Chain Orientation, Operations & IT applications)

Marketing Network (Functional Integration)

External Factors (Counterfeiting Concerns)

External Factors (Regulations)

The model developed to study the reverse logistics investigates the affect of independent variables on effectiveness of reverse logistics is presented in Exhibit 3. 3. This model has been the framework to develop the format of the survey used for the project. The structured interviews allowed an in-depth study of the major players in pharmaceutical industry.

Strategic & Operational Factors Management of Returns

Product Integrity Concerns

Functional Integration

Effectiveness of Reverse Logistics

Exhibit 3. 3 Dependent and Independent Variables

The interview based survey and the likert scale survey combined are expected to highlight the pharmaceutical industry's concerns on reverse logistics. These concerns will help in identification of future development opportunities. The international practices and global organization such as WHO concerns highlighted by literature review will be used to develop recommendation for improving reverse logistics practices in Pakistan.

3. 7 Statistical Technique

The Likert scale survey shown in Appendix-A3 was used to collect specific information to test our hypotheses. The data collected through mail/email revealed many inconsistencies and the analysis showed that the person filling the forms were either not informed or were not exercising due care. As an example, most companies had indicated not using RFIDs at present while the Likert survey showed more than 30% using RFIDs. A revisit was carried out to collect the data again.

Likert scale survey gauges respondents opinion by asking how strongly they agree or disagree with the question put to them. The questions are rated on a scale (of say 1-5 e. g. strongly agree = 1, agree = 2, undecided = 3,

disagree = 4, and strongly disagree = 5.) for statistical analysis using software such as Excel or SPSS.

We can begin analysis with descriptive statistics. Likert scale data is analyzed by using mode or the most frequent response. The data can also be displayed as a bar chart with one bar for each response category.

There are many approaches for inferential analysis such as using Mann Whitney or Kruskal Wallis test for analysis of variance, the data can also be analyzed by simplifying the data into two nominal categories such as agreedisagree. This simplification offers other analysis possibilities such as using Chi square test or T-test.

We have chosen to perform the T-test as most suitable for the fixed and independent variable for our data.

3.7.1 T-Test

T-Test is useful in testing if there is a significant difference between the means of two groups such as between those agreeing and those disagreeing with a possible outcome or hypothesis. The formula for t-test is a ratio between two means of averages and the variability of the scores.

Exhibit 3. 4: Formula for the T-test

Where XT is the mean of test group and XC is the mean of control group. While varT and varC are the variations in the corresponding groups and 'n' are the numbers in the groups. The t-test assumptions include; independence of the two samples and that the sizes of the two samples are approximately equal. Both of these assumptions are valid for our data.

3. 7. 2 T-Test using the SPSS

Using the data from Likert scale survey fed into SPSS, we use analyze, compare and independent sample T-test. The variables are then selected into the test variable box. The grouping variable is the selected into " group variable box" and define groups.

In order to perform the t-test, we choose," specify values", enter the code for the variables and perform the test. This results in SPSS T-test output. The Ttest is then interpreted for equality of variances (Levene's F value), equality of means (Sig, 2-tailed) to check if there is significant difference between the means of two groups.

CHAPTER 4: RESULTS

This chapter presents the information collected as a part of the result investigation. The literature survey revealed the areas of concern in pharmaceutical reverse logistics. The medicines have a shelf life and the concept of asset recovery or recycling require a much higher degree of ingenuity. The medicines cannot be ethically used after their expiry. Moreover, while a typical medicine has a shelf life of two years, the customers (pharmacies) are reluctant to keep the medicine which has a couple of months left in the expiry and cleaning of channel becomes necessary for customer service reasons. The literature survey also identified areas of concern in ensuring the integrity of products in forward logistics and the ability of reverse logistics process to monitor and control these areas of concern (such as monitoring reverse logistics to prevent counterfeiting, role of corporate vertical marketing management system in ensuring that unscrupulous dealers are eliminated). The larger pharmaceutical companies have set-up a comprehensive network of medical representatives, sales persons and a system of own distribution or reliable third parties to assure an efficient distribution system.

The World Health Organization (WHO) has identified counterfeiting as a major area of concern for Pakistan reporting as much as 50% of the medicine being produced in the country as counterfeit. This figure is highly debatable and requires investigation.

The advent of new technology such as Radio Frequency Identification (RFID) system promises highly coordinated and controlled systems of inventory management in all areas of distribution and retailing and is being advocated for pharmaceutical distribution and return management. Application of information technology in pharmaceutical distribution and return management is an area that requires investigation.

Analysis of the information from published sources helped in identifying the areas of concern for Pakistan's pharmaceutical sector and helped in developing information requirement for primary data collection.

4.1 Collection of Primary Data

In order to understand the working of the pharmaceutical industry and the areas of concern, it was decided to collect comprehensive information in the form of a survey/structured interviews. Appendix A-2 presents the questionnaire developed for this purpose. This questionnaire was comprehensive and taxed the patience of both the researcher and respondents. The information collected however justified the effort.

A second data collection form focused on the areas of concern of reverse logistics. This form Appendix A-3 is based on the Likert Scale rating to various aspects of reverse logistics. The Likert scale based survey has been statistically analyzed to assess the significance of important factors affecting reverse logistics.

4. 2 Analysis of Structure Survey

The analysis of research data reveals many interesting findings (Appendix A-4). The survey included small to large pharmaceutical companies. Nearly 70 % of the companies surveyed were under Pakistani ownership, 7% of the companies were working with foreign collaboration while 22% declared themselves as multinational (Exhibit-4. 1). This data gives us a good overall picture of the industry as this break-up is in close approximation to the industry breakup.

46% of the companies surveyed had a turn over of between Rs 50-99 million per annum, 50% of the surveyed had a turnover of more than Rs 100 millions and the remaining had a turnover of less than Rs 50 millions (Exhibit

4.2).

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The majority of companies surveyed employed over 400 staff members (Exhibit -4. 3) indicating the pharmaceutical sector to be a major source of employment in the country.

Most pharmaceutical companies are involved in formulation and packaging. Although some companies indicated basic formulation, this often involves the finishing stages such as purification. This type of basic manufacturing is often the result of government incentives offered to basic manufacturers. Basic manufacturing, which uses basic raw material, is generally not being carried out. The traditional medicine based pharmaceutical companies are involved in basic manufacturing. In our survey 75% of the companies reported to be involved in formulation and packaging (Exhibit-4. 4).

Many of the smaller pharmaceutical companies are importing and distributing medicines in ready to sell form. The multinational and large local companies also importing some of their products in ready to sell form (Exhibit 4. 5-4. 6).

In volume terms, the companies importing active ingredients are producing bulk of the medicines sold in Pakistan to meet 80% of the domestic demand while imported medicines account for 20% of the national consumption [Pervez, 2008].

The survey showed that 60% of the pharmaceutical companies are exporting medicine to regional countries in ready to sell form (Exhibit – 4. 7)

4. 3 Reverse Logistics in Pakistan's Pharmaceutical Industry

Pharmaceutical sector has been at the forefront of adopting supply chain practices. Our survey found that almost all companies claimed to have supply chain departments often managed as a separately entity. Many companies surveyed indicated that the basic drivers of supply chain were being operated as a part of supply chain management. Almost 70% of the companies surveyed indicated following their logistics operations as a part of supply chain (Exhibit- 4. 8). An overwhelming 80% of the respondent indicated having a dedicated supply chain department (Exhibit – 4. 9).

The survey showed that the companies extensively use services of external service providers in their supply chains. 42% of the respondents indicated significant involvement of third part services while 30% indicated using third party services in some of their activities (Exhibit- 4. 10).

A breakdown of third party involvement by services (Exhibit – 4. 11) showed that third party services are used in reverse logistics by 6% of the responding organizations.

Reverse logistics in a basic pharmaceuticals manufacturing industry can be divided into three areas:

The first part relates to reverse logistics management of supplies

The reverse logistics of basic raw materials and by-products for recovery of assets and

handling returns from the customers and consumers

In Pakistan, the pharmaceutical industry is not involved in any significant basic manufacturing operations. As expected, the second step listed above is insignificant in that case. The processing being of rudimentary nature involves recovering or disposing of solvents used in processing.

4.3.1 Reverse Logistics of supplies.

The supplies to the pharmaceutical industry consist of packaging materials, local raw materials, and imported raw materials. These supplies are subject to routine quality checks. Any material not meeting the specification is returned to the supplier (Exhibit- 4. 12)

The pharmaceutical companies especially the multinational and large local companies have over the time built strong relationships with suppliers and almost 25% of the companies indicated that their suppliers were ensuring quality at their end and supplying packaging materials with zero-defects (Exhibit- 4. 13).

Close loop reverse logistics is also practiced in pharmaceutical industries. These include bulk material containers, inert gas cylinders, non toxic material drums and similar supplies. (Exhibit-4. 14) shows that 20% of the respondents have some form of close loop returns.

4. 3. 2 Reverse logistics of material generated in processing.

As discussed above the main form of production is formulation and packaging. A few companies have introduced processing of semi-finished medicines into finished products locally. This partial processing enables the companies to claim benefits allowed to basic manufacturers by the government. The materials generated during these operations range from no byproducts to wastes requiring disposal (Exhibit-4. 15 to Exhibit-4. 17).

4. 3. 3 Reverse logistics of pharmaceuticals.

A very large proportion of pharmaceutical companies are unable to assess their cost of reverse logistics. Most companies reported that returns are handled as a part of regulatory and customer service factors.

In a number of cases, the medicines have to be withdrawn before the legal expiry date printed on the medicine packing, as consumers are reluctant to purchase medicines, which only have a few months left to expire. These medicines are accepted back as a part of customer service as cleaning the channels. What happens to these near expiry medicines seems to be unclear. A few companies indicated that these medicines are donated to charitable hospitals where they can be used before the actual expiry date. The informal discussion showed that these medicines could also be sold (redistributed) to organizations, which can use these before their expiry. In any case, all expired medicines are collected and returned to the company to avoid regulatory issues. Over 80% of the respondents estimated that returned medicines account for 1-5% of medicines sent to the market (Exhibit- 4. 18). For most companies the cost of organizing reverse logistics was less than 1% while about 20% companies estimated it to be between 5-10% (Exhibit-4. 19).

Most companies have conservative policies for entertaining returns, only 9% of respondents indicated following very liberal return policies (Exhibit- 4. 20).

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The disposal of expired medicines was reported to vary from burial to incineration. In smaller less well managed companies handling of these expired medicines was said to lack strict control. Informal discussions showed that some of these expired medicines could filter back in the market through unscrupulous retailers.

The majority of respondent companies have their own distribution network and the reverse logistics uses this network. Almost 65% of the companies surveyed used their own distribution network for reverse logistics while the remaining employed a combination of own/third party logistics (Exhibit- 4. 21). Nearly 25% of the respondent indicated disposal by third party companies. Many of the companies do not have their own incinerators and 3rd party services are used for this purpose by these companies.

Another important finding of the research is the extent of counterfeit medicines. Most companies indicated the size of the problem to be insignificant. The counterfeiting is kept in close check as companies are using their own distribution network or reliable third party companies in their own business interest. It appears that the figure quoted by WHO is grossly exaggerated and results from the definition of counterfeiting. The medicines sold as herbal and homeopathic medicines often list active ingredients but not the active ingredient content and is thus classified as counterfeit. The industry-wide estimates of counterfeit medicine were quoted as between 1-3 % [PPMA, 2005]. Companies adopt different tactics to control movement of medicines throughout the chain, such as identifying distribution by regions. This is often done to control over enthusiastic sales managers encroaching upon other managers' territory. This practice also helps in identifying any https://assignbuster.com/reverse-logistics-management-in-pharmaceuticalindustry-management-essay/ unauthorized or counterfeit medicine. The companies keep a close watch for counterfeiting and counterfeit check is one of the major concerns in reverse logistics too (Exhibit-4. 22)

The expensive medicines are often supplied through highly reputable pharmacies or by company's own sales representatives e. g. Eli Lilly's osteoporosis medicine Forteo costing Rs. 22, 000/= for single injection and requiring low temperature storage, the company delivers the medicines in hospitals or patients homes through their sales representatives stored in icepacks. A few large pharmacies such as Kausar Medicos are the appointed pharmacies for this type of expensive medicines. This kind of close control protects product efficacy and also eliminates counterfeiting. Expensive (mostly imported) medicines are only made available through wellrecognized large medical stores and pharmacies and often directly delivered to hospital pharmacies.

4.3.4 Role of information technology in pharmaceutical industry.

Information technology has begun to make its mark in the handling of pharmaceuticals. However the technology is not keeping pace with the global development. In the survey carried out to study possible application of Radio Frequency Identification systems (RFID), a number of respondents showed total ignorance of RFIDs. Most pharmaceutical companies are using computerized entry and tracking for pharmaceutical marketing and reverse logistics (Exhibit – 4. 23). Bar codes are the other application of information technology. Only 3% of the respondent cited using electronic data interchange (EDI) for reverse logistics. No one is using RFIDs perhaps due to absence of the required hardware for using RFID technology.

4. 4 Analysis of Likert Scale Survey

This survey (Appendix A-3) was emailed to pharmaceutical companies as a follow up of structured survey (Appendix A-2). The responses received after several request for expediting the return turned out rather disappointing. It was clear from the analysis that the survey was not completed with the required care and attention. For example, respondents who had earlier showed total ignorance of RFID had now indicated that they were using RFIDs as a means to manage supply chain distribution. This anomaly resulted in miss leading analysis of hypotheses.

This problem necessitated a revisit for data collection. It became clear that respondent fatigue was a factor in old responses. The senior staff that had kindly devoted considerable time to the previous survey passed on the follow-up survey to lower staff and requests for expediting the survey was to be blamed for the replies. The senior managers kindly agreed to look at the forms once again and the data analysis with smaller sample was carried out again to check the hypotheses.

With that it was found that 4 of the hypotheses were accepted when the Ttest was run with the significant value of 0. 25 for H1, 3. 13 for H2, 0. 00 for H3, 0. 00, 0. 00 and . 204 for H4 and 0. 85 for H5. The questions were rated on a scale of 1-5. Strongly disagree = 1, disagree = 2, undecided = 3, agree = 4, and strongly agree = 5 for statistical analysis using software SPSS.

To test the hypotheses 4 was taken as a test value on T-test. A value which is 4, close to 4 or greater than 4 is either completely agreeing or close to an agreement with a statement in likert scale questionnaire. The results of Ttest are presented in Appendix A-5. The first hypotheses that reverse logistics is carried out for cleaning channel or removal of expired products was approved (Exhibit-4. 24). The mean value is 3. 8 which is very close to the test value of 4. The difference is insignificant, only 0. 252. This insignificance means that reverse logistics in Pakistan's pharmaceutical industrial is mainly used for cleaning out channel with newer inventory, to replace old stock, to introduce new packaging or products and to remove expired products from hospitals or pharmacies.

Second hypotheses that distribution system organization and control is an important factor in managing reverse logistics was also approved (Exhibit-4. 25). This suggests that all the companies included in the survey have a strong supply chain network which allows them to completely ensure a complete recovery as well as they have a strong check over fake products by marketing though limited distributions channels and outlets. The acceptance of H2 also indicates that pharmaceutical companies recognize the importance of mentoring and controlling distribution of medicine for both forward and reverse logistic. Third hypothesis that counterfeit medicines are a major concern for the pharmaceutical industry was disapproved when T-test was run for it (Exhibit-4. 26). The significance value of mean difference is 0. 00 and the mean response value is 3. 19. These results show that concern for the counterfeiting are mixed. Some companies are conscious that counterfeiting is a real possibility and must be carefully monitored while others do not find it to be a significant problem. Survey included companies producing generic medicine as well as proprietary medicine. It seems logical that the generic producer will be less concerned with counterfeiting of their product due to low margin. The branded products have higher margins and are more susceptible to counterfeiting of their products.

Fourth hypothesis the information technology advances such as RFID, track and trace is helpful in reverse logistics was also approved (Exhibit-4. 27). Though the pharmaceutical companies presently do not have 2-D, 3-D or RFID technology employed but their own track and trace system for their products is strong enough for tracing necessary information. With no doubt, the information technology has made considerable inroads into management of forward and reverse logistics and record keeping in most companies is computerized. The next level of measures, such as 3-D bar coding and RFIDs, are still not being used. This technology is still in early stages in the developing countries of the world. Concerns for cost, technology and privacy issues have been major barriers to RFIDs in the developed world. There is no doubt that with increased availability of RFIDs based system and reduction in prices, RFIDs will be introduced by multinational companies in Pakistan and eventually by large local companies. The last hypotheses that reverse logistics is managed efficiently to ensure that pharmaceutical reverse logistics is monitored, controlled and not ignored just as a market expense was also approved with an insignificant value of 0. 856 and mean being 3. 97 (Exhibit-4. 28). The acceptance of this hypothesis clearly shows the pharmaceutical sector is active and alive to carefully manage and control returns. They do not cater return costs importantly and not ignored or justified with marketing expenses.

Cronbach Alpha yield . 946 or 94% as a reliability statistic of the data (Exhibit-4. 29).

The Likert based survey was also analyzed for mode to determine the most frequent response for each survey question. The mode being more appropriate for Likert scale was used to find the most dominant responses. These responses (Appendix A-6) are good indications that our hypothesis stands statically approved.

CHAPTER 5: DISCUSSIONS, IMPLICATIONS, FUTURE RESEARCH AND CONCLUSIONS

5.1 Discussions

This study has been able to fill a gap in our information on the Pakistani pharmaceutical industry. Reverse logistics is still a largely unexplored area in supply chain management. Information about return management, managing returns to improve the efficiency of the reverse logistics process, extracting value where possible and protecting environment from mindless disposal of expired, damaged and end of life products has acquired great

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importance in the environmentally conscious and highly competitive business environment of today.

The pharmaceutical industry is a sensitive sector where mishandling of expensive medicine not only compromises the profitability of the sector but also plays with the health of those who purchase these expensive medicine expecting to be treated of their illness. Counterfeit or expired medicines, improper cleaning of channel of expired medicine has implications far beyond the profitability of the sector. It is a matter of life and death for the consumers.

The regulatory bodies have devised all the regulations necessary to protect the industry and the consumers. Poor implementation of these regulations, the temptation of making high profits by producing substandard and/or counterfeit medicines and presence of unscrupulous elements in distribution networks has put the onus on the pharmaceutical industry to safeguard the integrity of their products, and manage the forward and reverse chains for effectiveness, efficiency and integrity of their products.

The pharmaceutical sector in Pakistan consists of multinational and large local companies on one hand and an array of small local companies on the other. The larger companies accounting for 80% of market have the resources to tightly control their distribution network and are better equipped to manage both forward and reverse processes. The risk of counterfeiting which affects the profits and image of these companies is also well recognized by these companies and reliable partners and most often own distribution network is employed to protect the integrity of their products.

The focus of reverse logistics in almost all of these companies is on customer satisfaction and regulatory compliance. The products, which are very close to the expiry loose consumer interest and have to be cleaned off the shelves. The expired medicines cannot be kept on the shelf and both the retailer and producers are obliged to remove and return these products to the manufacturer for disposal.

The cost associated with reverse logistics cost is considered a marketing and distribution expense and by many claims is considered to be a very small proportion of total costs (1-5%). Managing reverse logistics is therefore of little importance and the medicines retrieved from the market are allowed to accumulate at local collection points for weeks and months until they are disposed of. The medicines are often removed one to two months before expiry due to consumers' reluctance to purchase these nearing expiry medicines. Most of the major producers like to project an image of corporate social responsibility and donation of these nearing expiry medicines to charitable hospitals can create a good image for the company. A few multinationals claim to have this practice.

The extent of information technology use in reverse logistics is limited to computerized tracking and recording of retrieved products. The emerging technologies such as RFID will add a whole new dimension to managing distribution and return of pharmaceuticals. The implementation of RFID is still in early stages in countries where the hardware required to implement the technology is already in place. Implementation in developed world is likely to introduce this technology in Pakistan as well through the multinational companies operating in Pakistan. Presently, there are no sings of RFID in Pakistan's pharmaceutical industry.

5.3 Implications and Recommendations

The implications of this research for Pakistan's pharmaceutical industry are numerous. It is clear that reverse logistics has been recognized as a necessity for regulatory and customer service objectives. Cleaning the channel of nearly expired drugs is necessary for consumer satisfaction. Reverse logistics has not received the attention it deserves and little or no attempt is being made to manage RL for managing costs and efficiency.

Delayed responses, long return processing times, poor control of returned medicines create potential problems for the pharmaceutical company. Poor control of returned medicine exposes pilferage and infiltration of the expired medicine into the market with counterfeit packaging. Cleaning of the channel for customer service reasons results in return of medicines, which have some time left to expire. This medicine could help boost company image if they are given away to charitable hospitals to provide free medicine for the poor as long as they are consumed before expiration.

The pharmaceutical sector in Pakistan consists of 285 to 300 companies but the real business is limited to the top 50 companies who control 80% of the market share. In fact, the top 100 companies control 90% of the market share. This leaves the remaining 200 or so companies with a minor share of 10% of the total market. Very few of these companies have the logistics support to ensure an efficient network of product delivery and reverse logistics. We sent out more than 250 survey forms to known addresses of all companies. The extent of response from the smaller companies indicates that some of these companies are either exporting generic medicines or have little or no business in Pakistan. Lack of marketing infrastructure in smaller companies can be problematic in ensuring efficient reverse logistics and can even create additional risk of counterfeiting of their products.

5.4 Future Research

Reverse logistics is a relatively new area for the industry. The pharmaceutical sector in Pakistan is highly organized and majority of the business is well controlled. The major manufacturers have managed to control management of returns effectively. The other economic sectors have paid little attention to the management of reverse logistics for increased profitability and customer service improvements. In many sectors reverse logistics promises to be profitable as refurbishment, residual value recovery, income from extended warranty can increase the profitability of those sectors. More importantly, a better return policy will help local producers create a brand image that is normally reserved for large multinational companies. It is proposed that reverse logistics in other economic sector be studied to develop recommendations to improve reverse logistics to increase the profitability of these sectors. W