CHAPTER - FOUR

CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS
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This chapter is devoted to conclusions drawn by interpretation of observations and findings, recommendations for successful applications of Information Technology for marketing pharmaceutical products and suggestions for future researchers.

Information Technology has had a substantial impact on our life style. It has changed the way we look at the world. The new emerging world, shaped and evolved because of information technology, is different in many respects. Though the process of evolution will take another 10-15 years to complete, yet, it is obvious that e-healthcare world will be substantially different from the traditional healthcare one. A few broad areas of difference that emerge from our findings and observations are as follows:

a) **E-enablement of Pharmaceutical Industry**: Though it has been slow to embrace information technology but pharmaceutical industry has experienced the benefits offered by use of information technology and slowly but surely it is adapting to its precept.

b) **E-user Physicians**: Physicians belong to the middle-upper or middle class strata of society and hence are amongst the most educated lot and are technology friendly; hence they are amongst the most profound users of information technology. As the new generation of physician will take over, the use of tools of information technology will be substantial.

c) **E-savvy Pharmacy Retailers**: Amongst the troika of health providers – Physicians; Pharmaceutical marketers and the Pharmacists – retail pharmacists have been slowest to take to information technology. The reason perhaps is their weaker financial status as also their relatively simple work pattern. However growing responsibilities and definite advantages that IT offers, have begun to change the retail landscape also. Retail chains have already appeared on the horizon and new
generation chemists are familiar with Internet and other such technologies. Future pharmacists will use IT to a large extent.

d) **E-Empowered Patient**: Internet has changed the patient considerably. He is no longer a passive observer of his own healing and medication. He participates in the discussion, seeks correct and complete information using IT tools, puts forward his opinion and at times even makes choices. There is a tremendous rise in health consumerism. For patients, health now is much more than just the absence of diseases. Patients now want to live a full life and not a life compromised by medical restrictions. In future the pharmaceutical marketers will ignore this empowered patient at their own cost.

e) **E-Prescriptions**: Not practiced yet in India, it does not even have legal endorsement, but online prescribing is not as remote as some may believe. It offers distinct advantages of speed, ease, security and lesser errors. Once it is accepted marketing would be transformed because then it will be possible to reach a physician at the precise moment he writes prescriptions.

f) **E-Medical Records**: A development not unrelated to the previous point is, that now it is possible to amass, store, analyze and retrieve comprehensive patient information at the click of mouse. This facility will bring some order to the largely fragmented information system we are familiar with so far. Information technology thus, provides us with the possibility of

i. Having an absolute integration of patient data and information

ii. Patient Information any time, anywhere to health-care providers

g) **Virtual Care Delivery**: Internet and other information technology tools have made possible to provide care through a virtual environment. People are looking forward for online clinical guidelines. Video-conferencing has helped to create virtual operation theatres and virtual consultancy sessions

h) **Replacement of Sales Force with Scientific Force**: There was anticipation that virtual sales team in near future may replace the real
sales team we have today. Pharmaceutical firms thus, would begin to communicate with physicians' and pharmacists online. Every one now agrees that this will not happen. But instead of having large persuasive sales force of today we will soon be having science force that will communicate better, will be highly knowledgeable and will be trained to help physicians in establishing outcome differentiation.

i) **Vanishing Intermediaries**: A pharmaceutical company with its own chain of pharmacies or even centralized shipment of medicines directly to the patient is set to arrive. The pharmaceutical distributors, therefore, stand on the brink of extinction, unless they reinvent themselves. This is all set to happen particularly for expensive drugs meant for chronic ailments.

j) **Emergence of Information Intermediaries**: The pharmaceutical industry is not only witnessing a gradual replacement of distribution channels with alternates ones but also emergence of information intermediaries that are gearing up to fill existing communication gaps in an era where information makes the competitive difference.

k) **Fresh Regulatory Norms**: Information technology has rendered many existing regulations ineffectual and has brought forth the need to implement new ones.

Apart from these, from the result and analysis we arrive at substantial and interesting conclusions, suggestions and recommendations. Details of the same are as follows:

1) **General**

**The Trends in investment in IT by Pharmaceutical Firms**: The findings on investment trends in IT by Pharmaceutical companies are interesting and enlightening. Important conclusions are as follows:

a) Pharmaceutical industry lags behind other industries in embracing IT technologies. This was anticipated, as we know that pharmaceutical industry is a conservative sector. It responds to any opportunity or change only with due deliberations.
b) Pharmaceutical industry is making slow but steady investment in information technology. The prevailing investment culture is full of caution and rationalism. There is a strong sense of judiciousness with every decision related to investment in IT. Every single rupee that is invested in information technology is invested keeping in mind the return that is expected. Recently Orchid has gone for an extensive investment in one instance what they call the "big bang approach" but it was not an impulsive decision and rather was very carefully planned and implemented. Their successful implementation has become a case study for SAP, the parent company of the extensive software package and they cite it proudly. The large investment pattern cautious approach is very much in keeping with the trends we find in developed countries.

c) Larger organizations are spending much more in information technology than their smaller counterparts. Multinational organizations, be they Indian or foreign in origin, are at the forefront in adapting IT. This is understandable as they can afford to make such heavy investments and they also need to invest heavily, because of the sheer extent of their operations. If top 10 companies account for 36% of the market it is expected they spend more or less the same on IT also.

d) Implementation of information technology accessories is an evolutionary process. That passes thorough four stages of evolution namely Functional Stage; Integrated Stage; Optimized Enterprise; Stage; Extended Enterprise Stage. This does not only represent investment milestones but learning milestones also. Investment in IT, without corresponding change in mindset of people involved, could be disastrous. Only an elaborate learning process can bring about required change in mindset. As learning is evolutionary in nature, therefore, investment in IT has to be correspondingly evolutionary also.

e) The initial investment is higher in hardware which gradually shifts to software and finally to services.
Most companies begin with automation of accounts and office administration. They, thereafter, continue to follow a predictable path of automation. Thus, Enterprise Resource Planning (ERP) packages always are implemented before putting into operation the Customer Relationship Management (CRM) packages. Evolutionary path, in any average pharmaceutical firm, go along following pattern:

i. Enterprise Application Integration
ii. Enterprise Resource Planning
iii. Supply Chain Management
iv. Customer Relationship Management
v. Sales Force Automation
vi. Electronic Data Capturing

While most companies are still focused on storage and access, others are leveraging their information to be more agile, gain new insights into business performance and for making better decisions.

Suggested future areas of research may include a detailed study of investment in IT in Indian Pharmaceutical industries. The future researchers are suggested to verify that it is the companies that spend intelligently will be more successful than the companies that spend heavily on information technology.

2. Product

Launching New Products

Launching new products is essential for any progressive pharmaceutical firm. Traditionally it not only took a long time for marketers to launch a new product but it lacked the coordination that is vital for any successful launch. Information technology can help in reducing the time required to launch a product. This will be beneficial, as it will not allow competitors to respond in
time. Aventis has shown explicitly, that launch of new product can be improved tremendously using IT tools.

Suggested future areas of research may include confirmation of the conclusions of this study by using survey method of research. Industrial researchers may test this supposition using experimental method.

**Drug Compliance**

The analysis of results and the subsequent discussions conclude that:

a. IT tools can be employed effectively to improve drug compliance

b. Health care givers should make use of such a technology to ensure better health and better quality of life for people.

c. Pharmaceutical marketers should be the catalytic agent in this process as it provides them with the opportunity to be responsible players and increase their sales considerably.

d. Since this reminder technology is still in its infancy and information technology itself holds many more promises. However, it is the responsibility of Government, Pharmaceutical Marketers and Health care givers to educate people about the dangers of non-compliance of drugs and train them in the use of IT tools available now for a better future. Technology now exists and hereupon the social scientists and healthcare providers have to take over the battle. Sensitivity and willingness of those involved in providing health care will be the most important determinant of the outcome of our battle.

e. This issue is important for Pharmaceutical marketers too as it provides a vital platform to them to fulfill their sacred obligation to the society by bringing down death and hospitalization and improving the quality of life of patients. This also means larger profits for them through sale of drugs that are not bought.

Suggested future areas of research may include studying use of IT tools with medication requirements:

a. Where Non compliance is a critical problem
b. Chronic conditions, particularly the asymptomatic ones, such as asthma, cancer, depression, diabetes, epilepsy, HIV/AIDS, hypertension and tuberculosis.

c. Assessment of available compliance information technologies for different categories of patients such as:

   i. Elderly persons
   ii. Children
   iii. Critically sick
   iv. Patients without familial and social support.

Management Of Rare Diseases

From the study it may be concluded that:

a. Management of rare diseases has always been a challenge for health care providers. Information technology provides, for the first time in human history, a possibility to extend medication to people suffering from such diseases.

b. Apparently the link between IT and treatment of rare diseases has not yet attracted the attention of researchers.

c. Government, NGOs, Healthcare providers and Patient groups can play a very important role in extending medication to this group of patients.

d. Pharmaceutical marketers should take up this opportunity seriously, as apart from allowing them to play a useful social role it also provides them with profitable business opportunities.

e. Small companies can, in fact, find niche markets for themselves by catering to the needs of patients suffering from rare diseases.

Suggested future areas of research may include:

a. Identifying and analyzing successful and unsuccessful case studies involving marketing of orphan drugs.
b. Study of critical factors affecting patient groups, their cohesiveness and ability to find medication at affordable prices.

c. An empirical study to establish a clear link between Information technology and management of rare diseases.

E-prescriptions

E-prescriptions are not common or legal in India so far. They have some definite advantages over hand-written prescriptions. The advantages are important from marketing point of view because:

a. Fewer errors in medication due to e-prescriptions will inspire greater confidence in patients. This will enhance sale of medicines and avoid legal and ethical disputes.

b. It will be possible to influence physicians’ decision vis-à-vis choice of brand at the time of writing prescription.

Suggested future areas of research may include confirmation of these conclusions using survey or experimental method of research.

3. Pricing

Pricing is one of the elements of marketing mix. From this study it appears to that information technology has marginal impact on prices of pharmaceutical products. Suggested future areas of research, however, may involve researching the successful and unsuccessful computer-based models for determining prices of drugs under patent.

4. Place

Enterprise Resource Planning

Implementation of ERP results is perhaps the most dramatic enhancement in the marketing related capabilities. It improves the speed of receiving, capturing and analyzing data dramatically. Even the accuracy of information is enhanced. This results in substantial reduction in time to respond to a crisis by making quick decisions. Also, ERP based decisions are proving to be better decisions than the ones that were earlier. Thus, we conclude:
a. Finished goods inventory in post automation period has been brought down spectacularly. This has resulted in major cost cutting for the organization and corresponding increased profits. What is more, the numbers of inventory related mishaps too have come down considerably. Thus, now situations, such as being overstocked in one region and under-stocked in another, have become more or less a phenomenon of past.

b. Forecasting for finished goods requirement is much better and timelier today, than ever before.

c. Orders that required a few days to process are now processed in a few hours. This means a distributor receives goods invariably well in time. This translates to a highly satisfied customer.

d. Pharmaceutical companies report a substantial improvement in receiving payment on time. This is now possible because of proper follow up that has been made possible by information technology based tools.

Suggested future areas of research may include:

a. Identifying reasons for the monopoly that SAP enjoys in pharmaceutical sector despite the presence many software support providers.

b. A comparison of pharmaceutical industry with other industries vis-à-vis success of ERP automation.

**Sales Operation**

Sales operations do reflect definite improvement with use of IT. Thus, there is a visible improvement in physician and chemist databank for the organizations using IT tools. What is more, updating of such records is simpler and instantaneous. Certain other sales operations, however, show no improvement even with the use of IT. Restructuring of sales territories, number of physicians visited per day and the average time an MR spends with physicians have not improved even marginally. Rather the average time spent with physician has reportedly come down drastically. But we do find improvement in Time to receive daily sales report. It is all set to improve
further and become many times simpler once the web-based technologies become operative. In fact, the daily reports then would be received in real time. The analysis and interpretation of data contained therein would also be made the same day. Even now the analysis, in terms of intensity and extensiveness, has improved substantially.

The dialogue now is two-sided. MRs are listening more and more to physicians and passing up this information to their respective companies. In other words, medicines and their packaging are being done with active participation of physicians. Thus, the evolution of process to transform physicians from consumer to Prosumers (producer + consumer) has already begun.

Suggested future areas of research may include a comparison of pharmaceutical industry with other industries vis-à-vis problems and prospects of sales automation.

**Market Segmentation**

From the results and analysis it is apparent that there has always been an intense need to segment physicians not only on familiar parameters but also on some imaginative and even unique parameters. Though pharmaceutical marketing has been based on one-to-one interaction with physicians, yet, the product and messages are same for physicians, who otherwise, differ considerably. Earlier it was not possible to segment them, but now, with aid of tools of information technology, it is possible to do so in an extraordinarily precise and sophisticated manner. Thus, we can say that

a. IT has helped in evolving segmenting parameters in pharmaceutical marketing to a great extent. The case studies cited provide evidence that there is a great potential in using segmentation to create a niche market.

b. Companies that make use of the new insights, provided to them by psychographic segmentation techniques, have benefited substantially.

c. Under the profound auspices of IT tools pharmaceutical marketing indeed is moving away from mass marketing to micro marketing. Thus,
the future does not belong to those who will come out with one great strategy but to those who will fashion multiple sensible micro-strategies.

d. Information is infinite. This implies that at a deeper level there would be infinite possibilities to data interpretation and make use of that data. There were, good and not-so-good marketers before IT came along and the same will be there after it will become a basic structure for everyone. The good results we find have now are not just a product of IT; rather, the credit goes to those who interpreted it and to those with sound knowledge of marketing, who harnessed it. IT, in other words is not a substitute for marketing skills. It is a medium that magnifies marketing capabilities. The human difference will keep the competitive edge with a few. IT infrastructure apart from hardware and software includes human-ware too.

e. Though most companies in future will use IT based segmentation, but the winners will be those who use IT more creatively and imaginatively. The future, therefore, belongs to the better marketers – those who are more innovative and resourceful strategists, and not necessarily to the ones who invest heavier in IT.

f. GIS and other technologies are being used increasingly to ensure health in a cost effective manner by mapping communities sharing similar life-styles. This should result in more rationale and equitable allocation of resources.

Suggested future areas of research may include:

a. Quantification, measurement and comparison of success of newer segmentation techniques.

b. Measuring the advantage of segmentation based micro-marketing over mass marketing of pharmaceutical products.

c. Measuring the cost reduction and enhanced reach of medication using GIS technology.
Retail Marketing

E-pharmacies will have series of implications on vendors, customers and other related parties. Customers may have many possibilities of choosing vendors over the net, but they prefer to buy from a few reliable ones. Thus, sincerity, integrity and honesty will still remain the corner stone of business through e-pharmacies.

e-Pharmacies offer simply too many advantages over traditional pharmacies. Innovation will help online pharmacists to survive and prosper. Internet eventually will bring the physician, the pharmacist and the patient much closer and ensure a healthier and mutually beneficial relationship.

Suggested future areas of research may include confirming the advantages of e-pharmacies that pharmaceutical market experts have predicted. Future researchers may also measure the advantages e-pharmacies bring forth.

5. Promotion

Training and Development of Sales Person

Learning and teaching has been greatly evolved under the influence of Information Technology. The constraints of time and space have been made irrelevant by IT. Pharmaceutical companies are expected to make use of IT tools to enhance learning of their sales force. This is because pharmaceutical industry is a proclaimed knowledge industry and thus, learning is central to it. Conclusions in this regard are as follows:

a. Pharmaceutical companies are using IT tools more and more to train their sales force.

b. Depending upon the individual firm’s ability to invest and the IT-maturity of their staff they use following type of learning technologies:

i. Distribution Technologies

ii. Interactive Technologies

iii. Collaborative Technologies

c. Information technology has helped to fashion learning systems that are more suited to adult learners.
d. IT tools have neither decreased the frequency of sales force training sessions nor their time duration. This was found to be linked to the enhanced need to learn now and not the failure of IT tools to achieve these objectives. IT, in other words has been used to enhance the quantity and quality of learning and not to cut costs.

e. IT based learning techniques will not replace class room sessions completely as learning can not be de-linked to live class room learning.

Suggested future areas of research may include identifying and measuring the changed needs of pharmaceutical sales training and also measuring the IT based training outcomes. Comparison of Return on Investment of different training technologies may help in settling down the confusion with regards to various training technologies.

Detailing

Information technology excited the pharmaceutical marketers the most vis-à-vis detailing to physicians. It is in here they saw the inherent possibilities in use of IT. Indeed a general anticipation was that tools of IT would perhaps make huge sales force redundant. It appeared significant because pharmaceutical sales force are a major cost for any pharmaceutical organization. From this study emerges a more sober picture. Thus,

a. It is obvious that sales force of today, which IT tools promised to replace, will be here tomorrow also - only their size would be more optimized and their quality will be enhanced dramatically. It will no longer just be sales force but will be a science force.

b. However, e-detailing will play an increasingly more prominent role in detailing. It will supplement and complement the traditional detailing practices and enhance the level of communication between a firm and the physicians. Physicians who cannot be reached temporarily would be overwhelmingly reached using IT tools.

c. The emerging phenomenon of e-detailing has something to offer to all kinds of pharmaceutical firms. Thus:
Larger firms with vast army of medical representatives will use e-detailing for intensifying the dialogue with physicians. E-detailing in such cases will supplement traditional detailing efforts.

Medium sized firms with relatively smaller sales force will use e-detailing to complement traditional MR-Physician dialogue. Thus, areas, where they are not able to depute MRs for a short or long duration, will be served using e-detailing technologies.

Niche marketers, with tiny or non-existent sales force may use e-detailing as the only or major means of communicating features of their products, to the physicians.

Physicians who are reluctant to meet MR also show interest in receiving information via IT tools.

With increased familiarity of physicians with Internet, usage of e-detailing too will increase considerably.

Even the quality of communication will improve in leaps and bounds.

There would be very many models of e-detailing, however, physicians are showing an overwhelming preference for models that empowers them to seek precise but correct information in shortest possible time. They dislike models where they are flooded with information.

Physicians trust internet-based information very selectively. Thus, to make e-detailing a success it is vital to establish its credibility amongst physicians. Organizations having low or dubious corporate brand will lose in the race of e-detailing.

It is found to be more successful with specialists rather than general physicians. Amongst specialists also it shows evidence of definite advantage with specialties where information and education is more critical – as in oncology.

There are critical factors that determine the success of e-detailing application. They are:

Sales team support
ii. Real benefits to the customers

iii. Faultless IT execution

iv. Interesting content and communication

v. Learning curve which is difficult to sustain

k. Still newer information technologies are emerging that are more powerful and cheaper. However, as nature of information remains same.

l. C-detailing (Customer detailing) too is emerging as an important means to reach out to the patients.

Suggested future areas of research may include:

a. A detailed study of the problems and prospects associated with e-detailing. So far studies have focused on qualitative aspects of e-detailing, however it is important now to carefully measure the return-on-investment of various e-detailing models.

b. Replicating the study with future tools of information technology.

c. To comprehend the potential of misuse of C-detailing. A careful study of its social cost and benefits is an urgent need of the hour.

Web Conferencing

Web-conferencing provides a much cheaper and in certain instances a much more powerful channel to reach out to the physicians. Market experts from USA consider it to be by far the most effective model of e-detailing

Suggested future area of research may include confirmation of this view.

Information Intermediaries

Information intermediaries too have come to establish themselves. Thus, the process of outsourcing detailing has begun. It is too early to comment on its success or failure.

Suggested future area of research may include detailed study of this new emerging phenomenon.
Sample Distribution

E-sampling has not yet begun in India. It will not replace the traditional method of distributing samples through MRs as sales personnel look upon samples as the trump card in their quest to reach out to the physicians. Also it is expected that extent of e-sampling will be linked to the extent of e-detailing a company practices. In other words, companies that overwhelmingly depend on e-detailing will use e-sampling also. This needs confirmation by future researchers.

Customer Relations Management

It has been obvious all along that pharmaceutical marketing has been built on the bed-rock of CRM. In the absence of tools of IT this approach suffered from severe and even crippling constraints. CRM envisages taking into consideration the views of physicians also but because of lack of proper mechanisms and technology this was not possible and as a result information was bombarded on physicians while their views had no takers. e-CRM, an opportunity provided by IT tools, however, has changed the scenario. Conclusions in this regard are remarkable. They are as follows:

a. Initial attempts to implement CRM have been poor. Such efforts put physicians and even the pharmaceutical industries in a poor light for the reason, that companies looked for short-cuts - simple solutions to what are essentially the complex problems. This could be because of their experiences with ERP implementation. But problems confronting CRM are very different from the problems faced by ERP solutions. Problems that CRM promises to tackle are highly unstructured and varied. They demand high level of ingenuity, innovativeness, creativity and imagination to solve them. ERP was successful because it is possible to reengineer all the processes and functions associated with it. But it is not possible to reengineer a customer. Customer is an entity that is unique, multifaceted, ever changing and often idiosyncratic. Failure of eCRM shows that IT in itself is not a solution, but its use to exploit marketing principles can only lead to success.
b. The newer approaches to implement CRM are better because they look upon physicians as more rational human beings.

c. Successful CRM campaigns depend upon making databases and interactive media like Internet.

d. Instances of successful implementation of micro-strategies shows there is a future for this approach. However, success is rare and difficult to achieve. It will take companies some time to emulate their counterparts in developed countries to be proficient. It does not require the knowledge of IT as importantly as a true understanding of information itself.

e. In future CRM approach will be used to enhance the skill and capability of the physicians to diagnose quickly and correctly and provide successful treatment economically to the patients. In other words the successful future pharmaceutical companies will shift emphasis from selling medicines to disease management.

Suggested future areas of research should focus on identifying success of various CRM approaches.

Direct-to-consumer Communication

Advertising brands to patients directly is not only unethical but illegal also. However Governments have absolutely no control over the information that is available to patients and physicians alike on Internet. It is generally perceived that as long as pharmaceutical firms use direct-to-consumer communication over Internet to enhance disease awareness, for better disease management as also to support physician-patient dialogue, the communication will not only be ethical but will also be beneficial to the society. We can conclude:

a. There is a support for Direct-to-consumer communications amongst Physicians.

b. Apprehension persists in the minds of healthcare professionals regarding the possible misuse of this medium.
c. Modifying behaviour, especially enhancing patient compliance and adherence should be the guiding principles for marketers.

d. There are some laudable endeavors to use this opportunity to provide enhanced and customized services to the patients and help them to live a healthier, happier and more meaningful life.

e. It is the collective responsibility, of all those involved, to empower patients and health care professionals by providing them correct and true details about diverse disease areas. This will help them to make independent decisions. It will improve disease diagnosis and drug compliance tremendously.

f. Some instances of its misuse too have been observed. A few recommendations in this regard are as follows:
   i. Pharmaceutical Marketers must educate people about disease first and then talk about their brand.
   iii. Synergies their efforts
   iv. Consider Physicians as partners.

Suggested future area of research may include a comprehensive study of direct-to-consumer trends in India

**Ethical Issues**

Information technology is powerful but is essentially devoid of any moral sense and hence can be misused and abused. As it adds power, an equal measure of responsibility needs to be evolved by pharmaceutical marketing. Since information will be available at practically no cost the ethical issues involve will pertain to confidentiality, responsible usage and security of that information.

Conclusions in this regards are as follows:

a. New ethical challenges are being thrown up by advent of Information Technology.

b. Response to such challenges demand creativity and insight.
c. We need to constantly practise, evolve and refine it.

Suggested future area of research may include a comprehensive study of ethical and legal requirements of changed scenario.

**Cost effectiveness**

Following e-technology tips are recommended for a cost effective use of IT in pharmaceutical marketing:

a. Create enduring, reusable material (Archive live events on the web)

b. Distribute content on multiple channels (Web; email; PDA)

c. Anticipate next wave of technology channels.

d. Focus on opt-in and not opt-out strategies.

IT definitely provides us with immense possibilities but it offers nothing to marketers looking for easy solutions. Creativity and insight in using IT technologies will be the most important component of success.

In a nutshell we can conclude that tools of IT can help pharmaceutical marketers in:

a. Increasing revenue and or lower costs

b. Improve quality and efficacy of operations

c. Reaching new customers that we do not reach otherwise

d. Maintaining/improving our existing customer relationships through focused initiatives

But it requires creativity, insight, fundamental knowledge of concepts of marketing and a basic respect for professional ethics.

There are sufficient evidence that data collected, analysed, and interpreted have assisted the researcher in testing the hypotheses formulated at the onset of this research work. These hypotheses have been qualitatively tested only in the face of the observations, findings and conclusions. Since this research work is first of its kind and the nature of the research is exploratory, therefore, it was not possible for the researcher to investigate into the quantitative aspects of the area. The researcher is hopeful that
future researchers will, through their research endeavors, either confirm or refute the conclusions of this work. They may also, within a reasonable period of time, replicate the work. A brief description follows as regards the hypotheses formulated.

Strategies adopted by pharmaceutical industry using information technology have not been significantly effective in marketing their product.

We have seen that despite spending crores of rupees in information technology, pharmaceutical companies have not been able to:

a. Enhance their sales dramatically
b. Could not cut down research and development cost
c. Could not lay out or even reduce their large sales force

Nor do they expect to achieve any of these objectives in future. Their major worry has been extremely high R&D cost and cost to maintain an army of highly knowledgeable medical representatives. E-detailing that was expected to make sales force irrelevant has not even fulfilled a fraction of its promise. Companies now do not expect to enhance sales of their drugs to even an appreciable extent. Thus, it can be safely concluded that tools of IT has not transformed pharmaceutical marketing. It continues to stand upon twin pillars of R&D and army of medical representatives deployed by the companies. Thus, this hypothesis is proved true.

Extent of success in using information technology in marketing pharmaceutical products is low as compared to failure.

There are areas where it seems to have made dramatic improvement. Inventory costs related to finished goods have come down unbelievably. Information that was received in a few days is received in a few hours or even instantly (as is the case with sales force equipped with mobile-phones and corresponding web-technologies) and also it is many times more accurate. Future marketing will be knowledge based, thus, companies using IT to train their sales team continuously will come out winner. But very soon these technologies will be available to most of the players thus, decisive advantage available to them will be lost in near future. Those who will not
equip them with IT arsenals will certainly perish but those having them will not have any added advantage. IT has simply upgraded the competitive edge. Further there are other applications that are yet to be comprehended properly. Applications such as eCRM and e-detailing have not paid the dividends yet, but are expected to come out with delicious fruits once implemented in an intelligent way using marketing principles. Thus, this hypothesis too is proved true.

*There are no IT based business models, which may be tried, in the near future for marketing pharmaceutical products.*

Business models are certainly emerging and that will make a vital addition to the current marketing practices. Thus, with support from IT, there would be newer emphasis on chronic-disease drugs. It is already happening. A more educated patient, through the responsible use of tools of IT, will look for a normal-life even after suffering from diseases such as diabetes, hypertension etc. It is expected that an educated patient will enter into a more meaningful dialogue with the physicians that will enhance the sale of products of trusted companies. Thus, corporate brand image will receive greater emphasis. IT tools are also expected to overcome major losses due to non-compliance of drugs particularly by the patients suffering from lifestyle diseases. There will be certain shift in pharmaceutical marketing from mass to micro-marketing. Thus, companies that will have a better understanding of segmenting their physicians will flourish. More and more companies will enter market of orphan drugs; thus, will be able to serve markets that remained un-served so far. Detailing will be multifaceted. E-detailing, web-conferencing, conferencing and use of information intermediaries will ensure a more comprehensive dialogue with physicians. Smaller companies that serve orphan drug market will do away with sales forces and depend upon e-detailing and other IT based marketing tools. E-prescription technologies, when implemented legally, will allow companies to reach out to the physicians at the time of writing prescriptions. Direct-to-consumer communications will help companies to reach out to the patients directly, at least, for the safe and trusted products. E-pharmacies will offer greater services to patients and hence will be preferred. E-pharmacies will
play a crucial role to prevent drug-drug interaction, food drug interactions and also reporting the adverse drug interactions. This will make pharmacists more responsible for drug related mis-happenings. Thus, this hypothesis is proved false at operational level.

There are no business opportunities available to different health care providers using information technology for marketing pharmaceutical products.

New opportunities are certainly available, as we have seen earlier. Their extent in terms of market size and profit appears substantive and as result we can expect future market growth to be linked to this also. Thus this hypothesis is proved false at functional level.

Returns of using information technology in marketing pharmaceutical products are low as compared to risk and dangers.

When trying to enter into a dialogue with patients directly or serving markets for orphan drugs or creating close relationship with physicians or reaching out to physicians at the time of prescription through electronic prescription technologies, will certainly be fraught with risks and dangers. Risks and dangers though would be higher because of unethical approach and not necessarily because of use of IT. Genuine accidents in medical treatment are acceptable as per the Supreme Court judgments. Thus, this hypothesis is proved false at functional level.

Though majority of our hypotheses have been proved true and are, therefore accepted. Yet, we find, that in certain respects, the corollaries to the major hypothesis have been rejected. This is because pharmaceutical products in themselves are incomplete without the information/instruction/knowledge associated with them. Thus, while classifying pharmaceutical products as "bits" or "atoms" we have to define a new category falling somewhere in between. Drugs are "atoms" but instructions and information about their usage and storage, are made up of "bits". Thus, it can be said that use of IT tools to market pharmaceutical products may not be as successful as that with "bits" products such as movies, music, software, banking etc.
certainly be more successful than with pure "atoms" such as cars or computers etc.

Also, it is the need of human touch that will always keep pharmaceutical marketing beyond the actual domination of IT.

More and better IT technologies are yet to come. It will be worthwhile to conduct a similar study after a decade also. Once an entire generation of pharma marketing players is IT-friendly, we expect the trends mentioned to gain strength and further prosper.

At length, the basic realism about IT will remain unaffected for pharmaceutical marketing too. It implies that IT tools alone, without inputs of human intelligence, ingenuity and moral values, can not bring a miraculous change.