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Technology Commercialisation in Drugs & Cosmetics Sector

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Abstract

The concept of commercialisation of technology is not new to our country. Over the years technology has improved in leaps and bounds. New technologies have been implemented in all spheres of governance and in educational institutions. A few decades back, communications using papers were the norm and this has been transitioned to electronic communications. This was possible because of technology improvement. Similarly in other areas also technology improvements are visible. Educational institutions and universities are embracing online payments by students and even salaries for staff are paid through electronic mode. Thus it is clear that technology has improved over the past two decades in our country. Technology improvement and new technology marketing are two different areas and they are not synonymous. Embracing new technology requires lot of time and money. Any product or service will have an unique technology of its own and all technology may not be possible for the market. Experiments in the lab will produce an excellent result but at the same time when it is commercialised it may fail in toto. Thus there needs to be a different approach while handling commercialisation of technology. Science do have an in-built technology layer and technology perse forms the fulcrum of science and engineering domain. Theoretical models can be developed for a process but that process cannot be commercialised due to various reasons. The authors have carried out a study pertaining to the commercialisation of technology in process industry and have evolved a framework for technology commercialisation.

Keywords

Technology, Commercialisation, Cost, Innovation

I. INTRODUCTION

We have come across different jargons like innovation, improvement, commercialising a product, technology transfer etc., They all mean different and each has its own merits and demerits. The objective of this paper is to understand the concept of technology commercialisation and suggest ways to embrace it. In the modern concept, product and service are interchangeably used and in both product or service, technology exists. Product perse is a result of technology and in service technology may not be visible, but it is inbuilt into

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the service design adopted by the organisation offering the service. The product can be an engineering goods, chemicals, drugs, cosmetics, leather goods etc., and the service can be with respect to banking, post office, electricity, restaurants etc., Each of the product and service organisations keep looking for improvements and tried to innovate their product or service. But all the improvements and innovations cannot be transformed to the live environment. Certain innovations and improvements can yield the desired results in primitive prototype stage. But when it is scaled up it may fail. Hence a cautious approach is required when a new technology is being implemented and a single factor which is considered is the cost-benefit analysis. In simple words this means the cost of implementing the technology and the benefits it provides to the user. If the benefits outweigh the cost, the technology is considered and the process is scaled up. The authors have focused on the process industry with reference to the pharmaceutical sector based in Chennai.

II. RELATED WORK

Many authors have published a document on the subject matter of the paper and they have not explored any particular industry in detail. However, the amount of time required for new technologies to emerge from fundamental research, go through demonstration and early stage deployment and diffuse into the market place also matters greatly, for the obvious reason that policy makers and innovators need a sense of how rapidly such technologies can make a material impact. The issue of the time taken for technologies to commercialise has received relatively little attention in the innovation literature, in spite of its criticality to understanding the feasibility of future mitigation pathways and directing technology innovation and deployment policy. But there has not yet been a detailed analysis of the timescale from invention to an agreed definition of widespread commercialisation of technologies. The authors have identified the gap between learning and executing the technology.

III. RESEARCH METHODOLOGY

The researchers have used historical approach for the study. The study is also based on primary and secondary data. The secondary data required for the studies were collected from various books and publications related to the topic under study. As part the study the authors conducted interview with 175 respondents using a structured questionnaire comprising of academicians, people working in the industry, research scholars and people running small business enterprises comprising of both genders. Most of them mentioned that technology commercialization is a challenging task since involves money and time. Hence most companies prefer to opt for technology transfer route which is readily available for a specific fee and subsequent

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fees are paid based on a memorandum of understanding. This approach provides ready-made technology which can be commercialized and the product can penetrate the market. The in-house approach is time consuming and the final results are not predictable. They also mentioned that there are no special incentives offered for technology commercialization, except the professional fee which is received after the technology is sold to corporates. Presently research scholars are not motivated to focus on technology commercialization as part of their research study. The respondents mentioned that research scholars chose a topic and carry out basic research and present the results without any mention about technology commercialization.

IV. LIMITATIONS OF THE PRESENT STUDY

The study is conducted in Chennai and suburbs where there are small scale process industries and the information collected from a variety of sources is compiled as part of the study. The findings are based on the interactions with the entrepreneurs in the small scale industry segment.

IV. ANALYSIS AND FINDINGS

In pharmaceutical industry while manufacturing a drug, it comprises of multistage process. Each process has a process control parameter and the output depends how well the parameters were controlled. In addition to this, there is a concept of yield of the product which means the output that is generated after following a series of operations. There will be some by products that will be generated during the course of series of operations. Hence the yield of the product should be a decisive factor. If the yield is high, the process can be improvised and transitioned for commercial purpose. If the yield is less, the process parameters needs to be redefined to achieve an optimum yield. The authors were interacting with three drug manufacturing company and found that all lab based reactions cannot be commercialised. Chemical reactions pertaining to drug synthesis can provide interesting results and on deeper understanding can be stimulating for research. But the same chemical reaction, will not yield the result that is required for commercialisation of technology. If a reaction is successful in the lab, the next step will be to opt for pilot testing at a slightly higher scale in order to check the repeatability of the process. If there is no repeatable results the commercialisation of technology cannot be considered. Certain eye drugs are very costly and they have been evolved based on sustained research. Hence technology commercialisation in the pharma sector is not an overnight decision. It may take years to stabilise the process and commercialise it.

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The authors during the course of the work found that small scale industry deliver an intermediate product for manufacturing the drug. These intermediate products are manufactured based on the standard operating procedures provided by the company which has outsourced the process to the small scale industry. Also the standards of manufacturing the drug is stringent meeting the food and drugs standards requirements in India and if the drug is exported to other countries they need to fulfil the regulatory requirements of that country as well. In case of USA, the permission from US Food and Drug Administration is mandatory. Small scale industry cannot afford to spend high on research and development and hence technology commercialisation is not considered by them. The big companies have a dedicated research group and their funding for research is high and they alone opt for commercialisation of technology. A technology commercialisation model for drug industry is difficult to be evolved. The following processes are involved;

a. Lab experiment
b. Pilot scale
c. Kilo scale – Phase I
d. Evaluation of output and by product
e. Kilo scale – Phase II
f. Process stabilisation
g. Commercialisation

In each of the above process, there cannot be a specific timeline. Most of the drug manufacturing process involves multiple steps and each step is crucial for the output of the product. Certain experiments will fail outright or will fail in one of the sub process.

The industry is of the view that the basic research output should be handled by the universities and the stabilised process should be provided to the industry. Most of the universities in India have University-industry linkages but it is not there with respect to drug manufacturing. Drug is a need for the society and if there are strong linkages with industry the drug price can be affordable as well. Technology commercialisation will boost the output of the product and give a fillip to the nation. Technology commercialisation involves the engineering design as well. Though the pilot test will be successful and commercialisation will be viable, the engineering design for manufacturing the product will pose a challenge. Chemical reactions needs to be controlled and the design should provide a mechanism for the same. Thus there needs to be a trade off between scientific research, commercialisation of product and engineering design. Similarly in the service industry also technology is not visible but funding is required to improve the quality of service. In restaurants the person who serve the food will not use any technology, but the menu that is prepared

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will be from a machine which is technologically driven. Thus technology commercialisation needs to be looked into with a strategic objective and requires a multipronged approach in order to sustain.

V.SUMMARY AND CONCLUSION

In India there is a need for technology commercialization in order to reduce the price of the products. Technology commercialization is applicable for both science and engineering domains. The opportunities of technology commercialization are related to cost, process stability and niche technology. At the same time challenges for commercialization of technology include; minimizing cost, clear process documents and process maturity. Commercialization of technology is applicable for both product and service industry. Commercial viability is always a difficult question to be answered and it needs a series of data points. Process industry requires a lot of time and funding to baseline the technology and commercialise it subsequently.

The drivers for technology commercialisation include: creating a competitive technology, scalability, cost effectiveness, option for intellectual property registration and provision for quality product. The technology commercialisation maturity should be commensurate with the nature of the product and should fit the market requirements. With international standards providing a baseline for setting the processes, technology commercialisation should be a business enabler particularly in pharmaceutical companies. Universities should focus on applied research and set up pilot labs for product development. This will enable the students to focus their thinking on commercialisation rather than pure research alone. Pure and applied research are two sides of a coin and they needs to be nurtured. Technology commercialisation can be classified as follows;
1.technology available/technology cannot be commercialised
2.technology available/technology not cost effective
3.technology available/technology cost effective
4.technology available/cost effective and scalable.

Thus it can be seen that technology commercialisation is not just a buzz word but it should be implementable. Applied research in drug chemistry should be focused to ensure that technology commercialisation is done to reduce the cost of the drug. For existing drugs, technical processes should be studied in detail and cost reduction should be carried out. Certain eye drops are priced very high and more research should be carried out in order to reduce the cost and make it affordable. Technology commercialisation maturity model should be developed and the government should offer incentives for technology innovations and set up applied research centres in the areas of science and technology. Universities should be

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provided additional funding for creating state of art labs and infrastructure for promoting drug research. By doing this India will move to the summit in the area of drug research and will be a force to reckon along with the world renowned drug laboratories who are involved in drug research. Technological commercialisation should be carried out at multiple levels and the government and the scientific fraternity should be involved in policy making and implementation. Though there is a separate drug research institute funded by the central government, other universities should be encouraged to commence centres of excellence in drug and pharmaceutical research in order to enable technological commercialisation for drugs. Similarly centre of excellence should be commenced in other areas of science and engineering in order to tap areas of technological commercialisation.

REFERENCES

1.https://www.venturecenter.co.in/pdfs/ISB-Conf-Paper-ver04.pdf - Accessed on 30th November'2019

2.http://www.iitk.ac.in/asid06/proceedings/papers/MB2_2_I.pdf – Accessed on 30th November'2019

3.https://ideas.repec.org/p/ilo/ilowps/992404923402676.html – Accessed on 30th November'2019

4.https://www.sciencedirect.com/science/article/pii/S1364032119303739 – Accessed on 30th November'2019

5.https://www.valmet.com/media/articles/experts-voice/five-steps-to-successful-commercialization-of-an-innovation/ - Accessed on 30th November'2019

6. https://www.nber.org/papers/w19764 - Accessed on 30th November'2019

7.https://www.researchgate.net/publication/304456000_Technology_commercialization_a_literature_review_of_success_factors_and_antecedents_across_different_contexts - Accessed on 30th November'2019

8. http://icitmsd.uim.lwtindia.com/data/IJTTC.pdf - Accessed on 30th November'2019

9.https://www.wipo.int/export/sites/www/sme/en/newsletter/2011/attachments/apax_tech_transfer.pdf - Accessed on 30th November'2019