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The Evolution of Studies in Pharma Market: A Systematic Literature Review

T. S. Parmar[1], Artee Aggarwal[2] and Sanjeev Bansal[3]
[1]Research Scholar, Amity University Mumbai.
[2]Professor, Amity University Mumbai.
[3]Dean FMS, Professor Decision Science, Amity University Noida.

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Corresponding Author Email: tspramar@hotmail.com

Abstract
The objective of this paper is to analyse and summarize the research and development in the global pharma market, including India since last 12 years. The methodology adopted for the review is structure literature review and Scopus database is selected for the study. A string search is performed on the Scopus database using the key terms "pharma industry, pharma market, and pharma sector" in the title of the articles published from 2007-2018 and indexed in Scopus database. A total of 259 articles have been identified from the database using key words pharma industry, pharma market and pharma healthcare contributing 164, 67, and 28 papers respectively. A structured literature review methodology is adopted for this study. The findings of the study propose to bridge the gap by evaluating the literature and then suggesting a more detailed study that is required to evaluate a wider spectrum of critical parameters and one that is updated to the latest stage of the dynamic market life cycle of the Indian pharma market.

Keywords
Indian Pharma Market, Pharma Industry, Marketing, Literature Review.

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INTRODUCTION
Pharma Industry/Sector/Market
The pharmaceutical industry is largely research-based industry. Not only has it been historically successful in providing valuable new medicines for the treatment of diseases, but also its research and development laboratories have made significant contributions to our basic understanding of those diseases(Administra-, Alliances, & President, 2007; Alcântara, Ferreira, Gadelha, & Miguel, 2018; Baenas, Belović, Ilic, Moreno, & García-Viguera, 2019; Ibarra-Cabrera, Mena-Pérez, Bondani-Guasti, & García-Arrazola, 2013; Khan, 2012; Les & Streith, 2018; Liew, Adhitya, & Srinivasan, 2014; Lokko et al., 2018; Miller, Hutchinson, and Goodman, 2018; Nordisk, 2018; Paper, 2015; PwC, 2012; Raja et al., 2018; Sariola, Ravindran, Kumar, and Jeffery, 2015; Sparrowhawk, Mackenzie, and Long, 2008; Thakur and Ramacha, 2012; Zambad & Londhe, 2014a, 2014b). In significant part because of the success of this industry, people today look forward to longer and healthier lives than ever before. Excellent reviews of this industry have been published (Brindley et al., 2011; Hollingsworth, 2015; Mason et al., 2012; Ng et al., 2017; Zambad & Londhe, 2014b). Historically, today's pharmaceutical industry emerged from a number of different sciences and approaches to finding therapeutics. Examples are: (1)

the early discovery that extracts of plants such as salicylates from willow tree bark could provide products with medicinal value; (2) the discovery that proteins could be used as drugs, i. e., BANTING and BEST's demonstration that insulin could reverse the ravages of diabetes in 1938, and commercial expression of recombinant proteins such as tissue plasminogen activator (TPA) by Genentech; (3) LISTER's small-pox vaccine and the development of the first monoclonal antibody therapeutic, OKT3, by JOHNSON & JOHNSON for prevention of tissue transplant rejection; (4) research in gene therapy; (5) use of genomics to find new targets for pharmaceutical intervention and (6) the scientific approach which spawned most of today's pharmaceutical armamentarium-modification of organic molecules to provide therapeutically active agents through medicinal chemistry (Arujanan & Singaram, 2018; Ilarslan, Vurur, & Bıyıklı, 2015; Liew et al., 2014; Polamreddy & Gattu, 2018; Sewell et al., 2017; Tajammal Munir, Yu, Young, & Wilson, 2015).

The global pharmaceutical market is divided into two segments. One segment is medicinal products available only on prescription by a physician or other healthcare professional (Birnbaum & Shaw, 2016; Brindley et al., 2012; Christensen & Karlsson, 2018; Haagen, Zahler, Zimmermann, & Al-najami, 2015; Hollingsworth, 2015; Macdonald, Fray, & McInally, 2016; Mason, 2009; Science & Pacifi, 2018; Srai, Badman, Krumme, Futran, & Johnston, 2015; Tannoury & Attieh, 2017; Thakur & Ramacha, 2012; Uhlig et al., 2014; Zambad & Londhe, 2014a). The second segment is OTC products. These are generally well-established treatments for minor diseases, where safety and the ability to self-diagnose are of no concern. In this discussion of the pharmaceutical market, both segments are combined (Bergström, 2011; Bin, Rezk, El-metwally, Laika, & Ali, 2015; Hernandez, Thiel, Mantel-teeuwisse, Raaijmakers, & Pieters, 2014; Nordisk, 2018; Sparrowhawk et al., 2008).

World pharma market country-wise table 1

Rank	Country	Value of Pharmaceutical Market (in millions of $) Apr 2017
1	USA	339,694
2	Japan	94,025
3	China	86,774
4	Germany	45,828
5	France	37,156
6	Brazil	30,670
7	Italy	27,930
8	UK	24,513
9	Canada	21,353
10	Spain	20,741

https://www.worldatlas.com/articles/countries-with-the-biggest-global-pharmaceutical-markets-in-the-world.html

Table 2 (top ten pharma companies)

Rank	Company	Revenue in 2018 (in millions of $)
1	Johnson & Johnson	81,600
2	Roche	56,860
3	Pfizer	53,600
4	Novartis	51,900
5	Bayer	32,170
6	Merck & Co.	42,300
7	GlaxoSmithKline	30,080
8	Sanofi	39,070
9	States AbbVie	32,750
10	Abbott Laboratories	30,600

https://en.wikipedia.org/wiki/List_of_largest_pharmaceutical_companies_by_revenue

Indian Pharma Market

The Indian Healthcare Segment is dominated by the Indian Pharma Market (IPM). The IPM itself has undergone a significant evolution since Indian Independence, influenced by multiple factors including Government Policies, changing disease patterns, re-alignment of the competitive/company scenario etc. So, for any participating company to emerge successfully, it is essential that it quickly understands this change and the consequent impact on the operational dynamics (Administra- et al., 2007; Bin et al., 2015; Chatterjee & Srinivasan, 2013; Nordisk, 2018; Sparrowhawk et al., 2008; Zambad & Londhe, 2014a).

The evolution of the IPM can broadly be divided into 3-time phases –

I. Indian Independence (1947) to mid-Eighties
II. Mid-eighties to 2005
III. 2005 onwards

Each phase had its unique characteristics, and this further influenced the constitution of the IPM and the strategic approach of the participating companies. All the successful companies quickly understood and accepted the change, promptly re-aligned their strategic approach and efficiently implemented their fresh plans (Aminov, 2010; Haleem, Salem, Fatahallah, & Abdelfattah, 2015; Les & Streith, 2018). The above approach suggests that to remain successful & relevant, it is essential to have a flexible and adaptive approach with quick decision making and action. Looking into the unique capabilities & characteristics of the IPM, it has also been seen that those companies that have kept the Indian market dynamics in mind have had a more impactful and consistent success. Yet, we have seen a significant churning and turn around in the IPM over the years. This indicates that to remain successful there is a greater need for companies to evolve dynamic strategies after holistically evaluating the IPM on a continuous basis. Moreover, it is also essential to address multiple success factors to remain relevant in the future. Individual companies must do their respective SWOT analysis and then decide on the prioritized focus that they want to put on respective success drivers.

METHODOLOGY

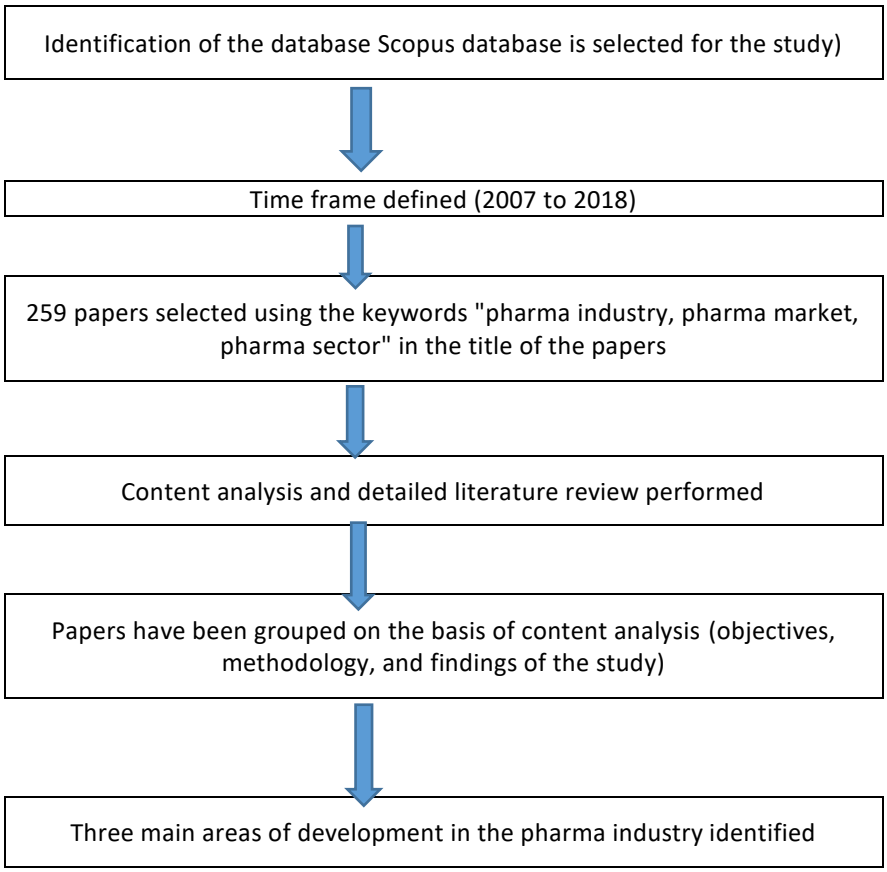

Figure 1 Flow chart of the methodology adopted

LITERATURE REVIEW

To fulfil the objective of the study, the author's adopt a Systematic literature review (SLR) focusing on the leading indexing bodies like Scopus (Dixit, Mandal, Thanikal & Saurabh, 2019). Cook et al., firstly used SLR and track its presence in the medical and healthcare fields as well. When we compare SLR with traditional and less systematic review approaches, SLR is generally considered better, as other researchers can easily verify the findings of the study. SLR enables the author's to cover the literature in a systematic and more comprehensive way(Sariola et al., 2015; Schrodter et al., 2012; Specht, Welch, Rees Clayton, & Lagally, 2018). It covers a specific time duration, in this paper from post-2007 literature from authentic sources. Only full text published articles with the terms pharma industry, "pharma market" and "pharma sector" in the title of the targeted Scopus database. A total of 259 papers were identified from the database.

(Paper, 2015) the annual report emphatically establishes that the Indian Pharma Industry has achieved an eminent position in the global Pharma sector and has been witnessing a phenomenal growth in recent years. It is well known that India is emerging as a world leader in generic Pharma production, supplying 20% of the global market for generic medicines. The industry accounts for 8% of global production and is exporting medicines to over 208 countries. The Indian Pharma Industry has been playing a pivotal role in the supply of affordable and quality pharmaceuticals to the developed and developing the world. More than 65 – 70 % of medicines in the WHO pre-qualified list of medicinal products belongs to Indian Manufacturers especially in the segments of HV – AIDS, TB, Malaria, Reproductive Health etc. (FICCI, 2014-15)

This WHO / FICCI report also highlights the 'Make in India 'initiative for creating and enabling the framework for stimulating investments in Pharma manufacturing. The Department of Pharmaceuticals has formed 3 task forces on:

I. Enabling the Private Sector to lead the growth of the Indian Pharma Industry
II. Medical Devices and Pharma Manufacturing Equipment
III. Development of capabilities for each vertical

(PwC, 2012) highlights the global opportunities and challenges being faced by the Indian Pharma Industry and gives a vision 2020 perspective from 'vision to decision'. Specific issues and their suggested solutions/approach have been given in this paper, clearly indicating a dominant role that the Indian Pharma Industry needs to play in the Global Pharma domain in the coming years. (PWC, 2012)

(Porter & Teisberg, 2004) in his Harvard Business Review paper makes a strong statement that "the wrong kinds of competition have made a mess of the American health care system. The right kind of competition can straighten it out. "

The US health care system has registered an unsatisfactory performance in both cost and quality over many years. While this may be expected in a state-controlled sector, it is nearly unimaginable in a competitive market, and in the US, health care is largely private and subject to more competition than virtually in any place worldwide.

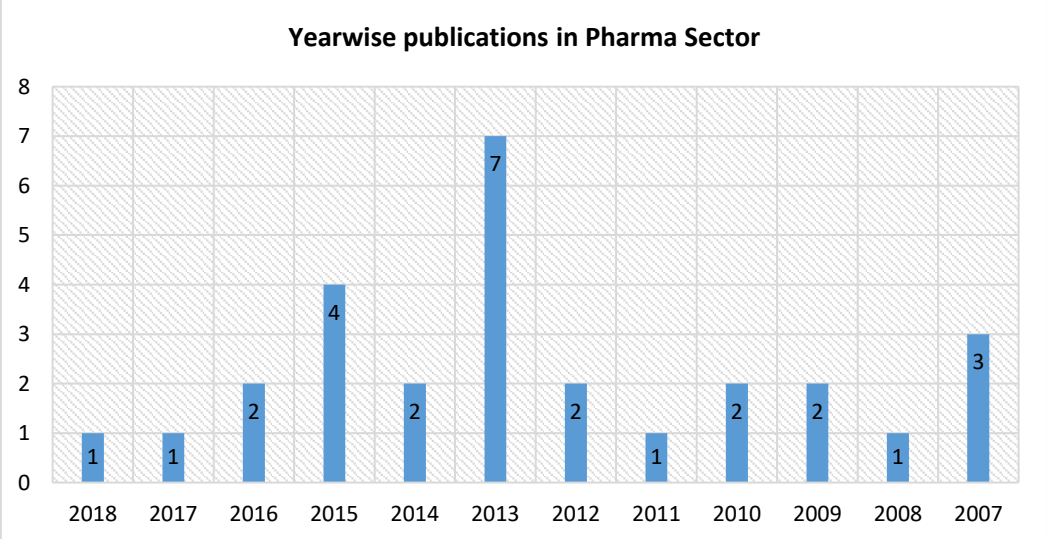

Figure 2 year wise publications (pharma sector)

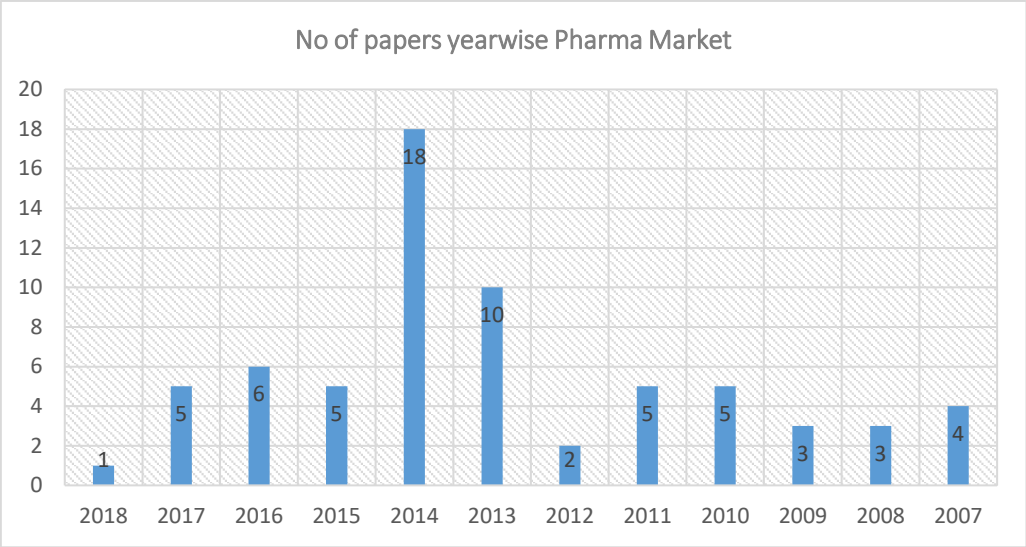

Figure 3 year wise publications (pharma market)

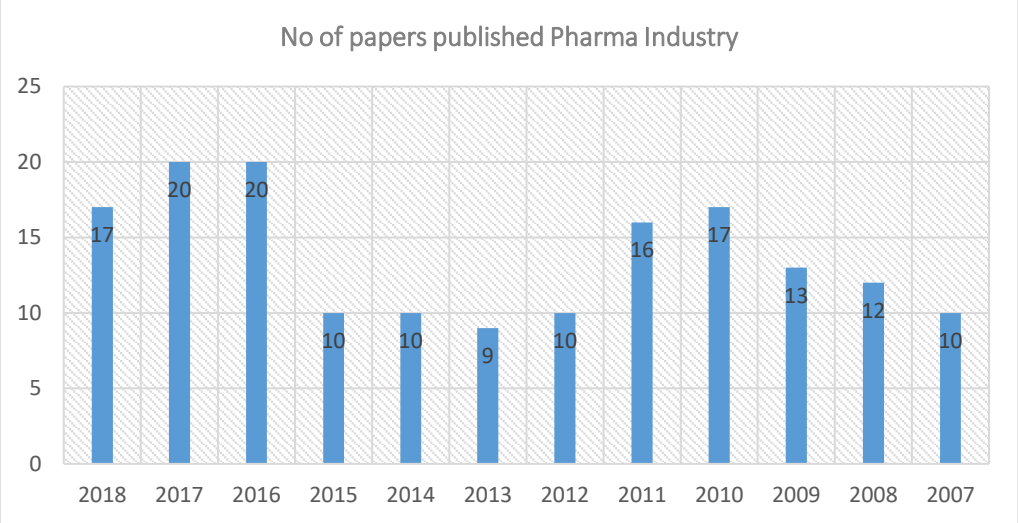

Figure 4 year wise publications (pharma industry)

Table 3 top 10 author's pharma market

Author Name	Papers published
Graul, A.I.	5
Cruces, E.	4
Rosa, E.	3
Alston, M.	2
Basset, H.	2
Challener, C.A.	2
Ciurczak, E.W.	2
Goodman, M.	2
Hennecke, D.G.	2
Howitt, N.	2

Table 4 top 10 author's pharma sector

AUTHOR NAME	No of papers
Berger, H.	3
Ehlers, A.P.F.	2
Haigney, S.	2
Ramesh, D.	2
Umbach, G.	2
Wechsler, J.	2
Abdul Rasool, B.K.	1
Akbari, B.	1
Alam, A.	1
Ali, M.E.	1

Table 5 top 10 countries pharma industry

COUNTRY	Papers published
United States	30
India	26
Germany	25
United Kingdom	9
Switzerland	5
Belgium	3
Finland	3
Ireland	3
Spain	3
Austria	2

Table 6 top 10 countries pharma market

COUNTRY	No of papers
Germany	12
United States	9
Bangladesh	3
Brazil	3
India	3
United Kingdom	2
Australia	1
China	1
Italy	1
Myanmar	1

Table 7 top 10 countries pharma sector

COUNTRY	
India	3
United States	3
Germany	2
Iran	1
Italy	1
Netherlands	1
United Kingdom	1

Table 8 top 10 affiliations pharma industry

AFFILIATION	Papers published
Ehlers & Partner Finanzdienstleistungen GmbH	3
Clinical Biometrics	2
Xcelience LLC	2
Pfizer Inc.	2
Jawaharlal Nehru Technological University, Hyderabad	2
Osmania University	2
Universiteit Gent	2
GlaxoSmithKline, USA	2
PRA Health Sciences	2
Forschungsvereinigung der Arzneimittel-Hersteller e.V. FAH	1

Table 9 top 10 affiliations pharma market

AFFILIATION	No of papers
Healthcare Marketing Dr. Umbach and Partner	2
University of Dhaka	2
Khulna University	2
Thomson Reuters	2
Bundesverband der Pharmazeutischen Industrie e.V. BPI	1
Pharmatech Associates	1
Gaco Pharmaceuticals and Research Laboratory	1
Ehlers Partner	1
Pharma Leaf India Private Limited	1
Wiesbaden Business School	1

Table 8 top 10 affiliations pharma sector

AFFILIATION	
C and EN Northeast News Bureau	1
Public Health Foundation of India	1
ASDMedia BV Veemkade	1
Competition practice	1
Università degli Studi di Padova	1
PharmSource Information Services, Inc.	1
Vellore Institute of Technology	1
Tehran University of Medical Sciences	1
Ehlers & Partner Finanzdienstleistungen GmbH	1
Institute of Management Technology, Ghaziabad	1

Note:
https://www.scopus.com/results/results.uri?numberOfFields=0&src=s&clickedLink=&edit=&editSaveSearch=&origin=searchbasic&authorTab=&affiliationTab=&advancedTab=&scint=1&menu=search&tablin=&searchterm1=pharma+industry&field1=TITLE&dateType=Publication_Date_Type&yearFrom=Before+1960&yearTo=Present&loadDate=7&documenttype=All&accessTypes=All&resetFormLink=&st1=pharma+industry&st2=&sot=b&sdt=b&sl=22&s=TITLE%28pharma+industry%29&sid=5cbe9866160227f108cefa08f665f35f&searchId=5cbe9866160227f108cefa08f665f35f&txGid=7c44a2c4ef6e467eb322b3c7d0014385&sort=plf-f&originationType=b&rr= for table 3-table 8.

Previous findings table 9

Sr. No	References	Findings
1	(Sariola et al., 2015)	Big-pharmaceuticalisation in India, whereby the local pharmaceutical industry is moving from generic manufacturing to innovative research. Using conceptual frameworks of pharmaceuticalisation and innovation, this paper analyses data from research conducted in 2010-2012 and describes how Contract Research Organisations (CROs) enable outsourcing of randomised control trials to India. Focusing on twenty-five semi-structured interviews CRO staff, we chart the changes in the Indian pharmaceutical industry and implications for local research cultures.
2	(Bharadwaj & Thompson, 2015)	A framework that provides a consolidated view of crowdsourcing processes, which in turn enables a strategic application of a crowdsourcing methodology based on problem type.
3	(Administra- et al., 2007)	Collaborations are helping to shepherd Indian drug companies into a new era of innovative drug discovery, but regulations governing patents, drug approvals, and clinical trials are still in the process of being updated.
4	(Kinch, Kinch, & Griesenauer, 2018)	Insight into the pharmaceutical enterprise, which reveals an industry already mature and beginning to retract before enactment of the legislation
5	(Willke et al., 2013)	Much of the initial research is Conducted by the pharmaceutical industry, guided by basic science but Also delimited by potential markets, regulatory approval requirements, trial size considerations, and payer expectations for evidence of value. Once a drug is marketed, further evidence can be generated via combining trial data, conducting a meta-analysis, and analyzing real-world results Through observational research designs; we explore how these efforts can benefit from cooperation across these stakeholders
6	(Birnbaum & Shaw, 2016)	There has been substantial interest in the potential value of collaboration between academia and the pharmaceutical industry
7	(Bin et al., 2015)	Pharmacy students who are enrolled in the capital city of Riyadh are not properly trained to play an influential role in local drug companies. As a result, their level of willingness to have a career in such important business is not promising
8	(Nordisk, 2018)	The Indian pharmaceutical industry has grown steadily in recent years, as indicated by the increase in production, capital creation, and Arrival of new players in the market. While the pharmaceutical Sector has had a significant impact on the Indian economy, managing it in today's complex environment has become challenging. Changes in the global economy intensifying competition and evolving industry policies pose challenges for pharma companies.
9	(Haleem et al., 2015)	Highlight the most important guidelines and practices of quality in the pharmaceutical industry
10	(Ku, 2015)	The recent rise of speciality pharma is attributed to its flexible, versatile, and open business model while the traditional big pharma is facing a challenging time with

		patent cliff, generic threat, and low research and development (R&D) productivity
11	(Hernandez et al., 2014)	The lack of public trust in the pharmaceutical sector (i.e. industry, authorities and doctors) could compromise the future of drug development and the regulatory system.
12	(Sharma & Mustansar, 2018)	A systematic approach for commercial-scale utilization of smart nanomaterials in the pharmaceutical analysis in terms of economic challenges, health & safety concern of nanomaterials and life cycle assessment within pharma industry are comprehended.
13	(Haagen et al., 2015)	The pharmaceutical sector, which plays an important role in Jordan, has a substantial heat demand. Industrial Solar installs the first system for SHIP in Jordan at RAM Pharma, a pharmaceutical company in Sahab, Jordan.
14	(Uhlig et al., 2014)	This mini-review touches upon the challenges and opportunities peptides Experience on the Track to be comedian approved pharmaceutical
15	(Tannoury & Attieh, 2017)	Sales of the pharmaceutical markets in BRICS and MIST countries doubled in 5years, Reaching a market share of approximately20%. The shift toward these new markets has been attributed to the large populations, growing prosperity, and increasing life expectancy in BRICS and MIST countries
16	(Bergström, 2011)	The established market model for pharmaceutical products, as for most other products, is heavily dependent on sales volumes
17	(Forster, Stegmaier, Spycher, & Seeger, 2014)	In recent years, a flexible concept to collaborate in R&D has emerged: virtual pharmaceutical companies (VPCs). These differ from other R&D companies, such as biotech start-ups, Collaborating with big pharmaceutical companies, because they solely comprise experienced teams of managers.
18	(Mignani, Huber, & Toma, 2016)	To increase R&D productivity, implementation of new and strategic R&D orientations to develop new approaches or systems to identify hits and leads efficiently has taken place and enabled all scientists working in the drug discovery domain to develop innovative medicines for the 21st century

DISCUSSION AND CONCLUSION

A structured literature review indicates that most of the studies done on IPM strategy, also globally, have tried to address the corporate strategic approach or just one or a few of the critical strategic parameters. There doesn't seem to be a comprehensive paper covering the entire spectrum of the key issues that impact strategy. Secondly, since the IPM has recently been in a highly dynamic state, influenced by multiple internal and external factors, the strategic outlook too needs to be equally dynamic(Administra- et al., 2007; Alcântara et al., 2018; Baenas et al., 2019; Ibarra-Cabrera et al., 2013; Liew et al., 2014; Miller et al., 2018; Paper, 2015; PwC, 2012; Sparrowhawk et al., 2008; Zambad & Londhe, 2014b, 2014a).

This research proposes to bridge the above gap by evaluating and then suggesting a strategic plan that evaluates a wider spectrum of critical parameters and one that is updated to the latest stage of the dynamic market life cycle of the IPM.

LIMITATIONS AND FUTURE SCOPE OF THE STUDY

More importantly and specifically, the proposed future scope of the work shall address in detail the importance and impact of the key strategic growth drivers 'New Product introductions as well as the Key Brand management ', on the overall growth/progress of a Pharma Company in India. This important area of research has not been adequately researched as per the literature survey conducted.

POSSIBLE CONTRIBUTION TO KNOWLEDGE

The Indian Pharma Market is a highly dynamic market needing a constant re-evaluation of strategic approach aligned with the latest 'critical success parameters'. There doesn't seem to be any recent study which addresses a wide range of these key parameters. This paper aims to identify the gap while also addressing the latest market dynamics.

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