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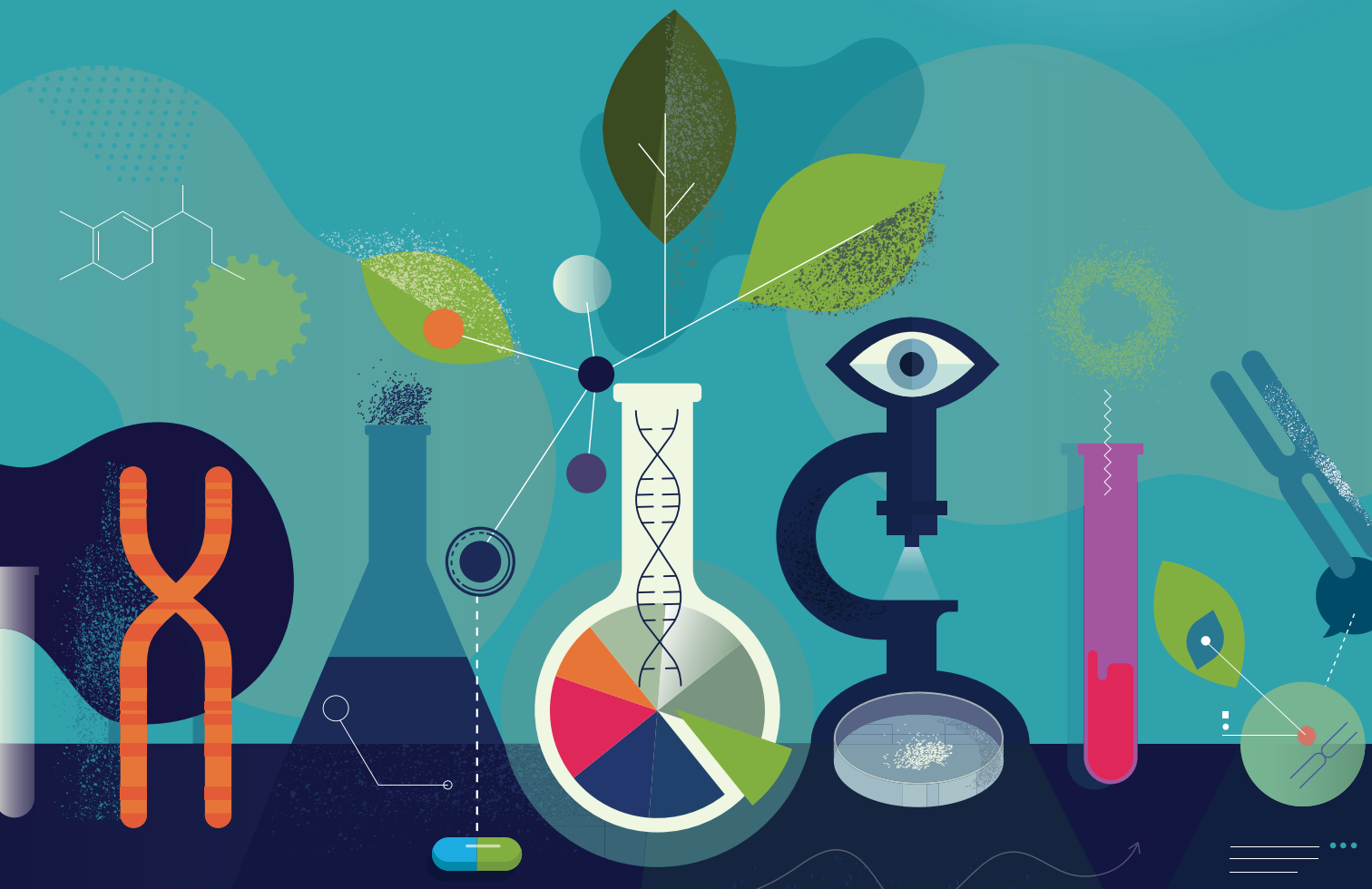
Revolutionizing R&D in pharma

How a multifaceted approach can help the industry improve efficiency and throughput

Despite being one of the largest contributors to global R&D spending, the pharma industry experiences some of the worst returns on its expenditures.[1]

Long development times, process inefficiencies, regulatory challenges and uncertain outcomes all contribute to poor returns. This lack of performance not only limits innovation, but also negatively impacts patients. Poor R&D performance can also lead to a lack of trust in the industry and the regulatory agencies that oversee it, which can have even broader implications for public health and safety.

Thus, the importance of improving R&D in pharma cannot be overstated. It's also important



to note that the potential financial benefits of improving R&D in the pharma industry are enormous. Studies show that companies that are more efficient in innovation have higher market valuations, superior future operating performance and better stock returns.[2]

In order to address the issue of R&D performance, pharma needs to take a closer look at techniques that have proven effective in other industries — namely the use of lean development methods.

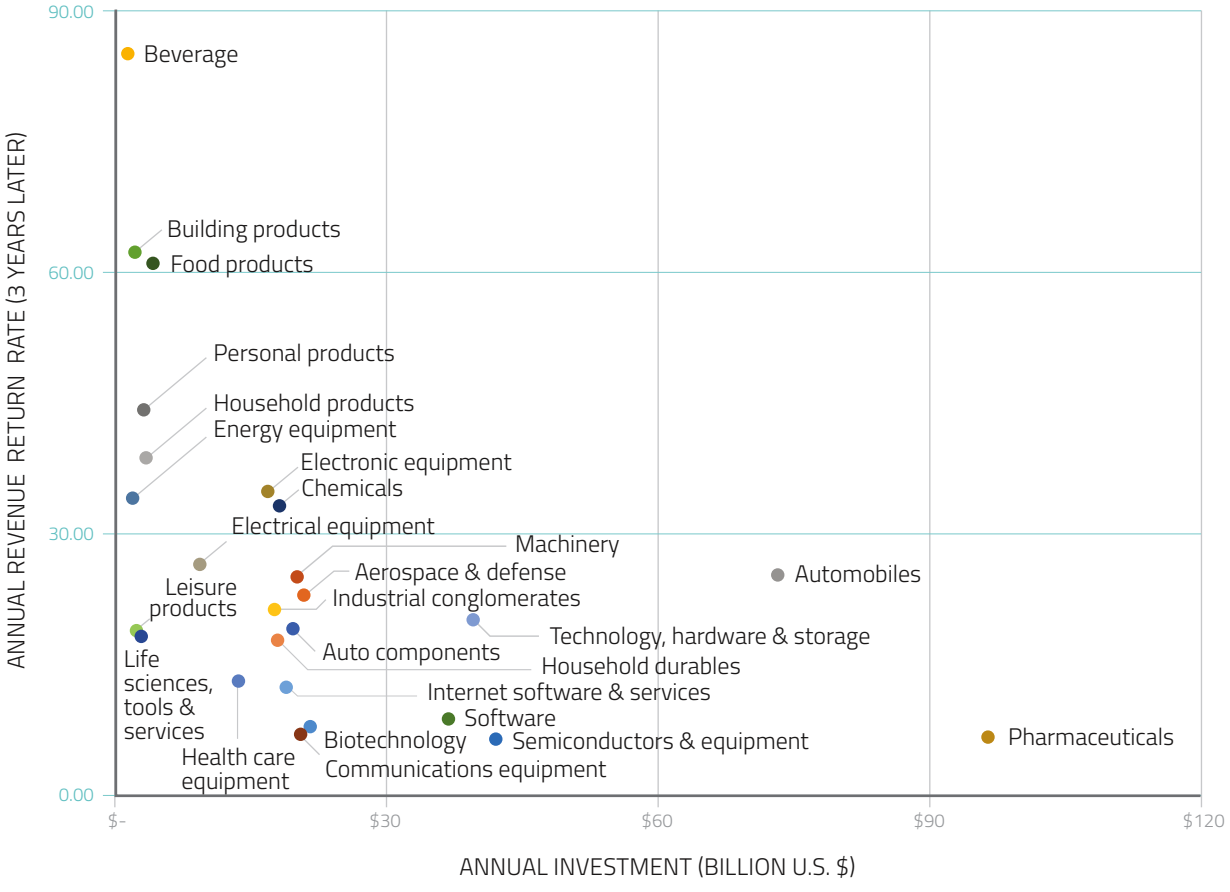
By adopting lean techniques and embracing innovation, the pharma industry can improve both top-line growth and bottom-line performance. Perhaps more importantly, the pharma industry has an opportunity to transform innovation and create a brighter future for patients, health care providers and society as a whole.

Current state of pharma R&D

According to Deloitte, global R&D spending in the life sciences industry as a whole (pharma and medtech) exceeded $182 billion in 2020, making it one of the largest R&D spending sectors in the world.[1] Despite this significant investment, the industry has consistently realized poor returns on their innovation investment.

A report by McKinsey & Company revealed that the pharma industry has the lowest return on R&D investment compared to other sectors.[3] The report found that between 2010 and 2019, the top 12 pharma companies spent a total of $1.1 trillion on R&D and generated $1.2 trillion in revenue. This translates to an average return on investment (ROI) of only 1.8%, which is

5-year average industry return rates for 1,000 largest public companies



SOURCE: ARGO-EFESO RESEARCH

Poor returns on pharma R&D investment: Contributing factors

1. **High regulatory hurdles:** The pharma industry is highly regulated, with complex and rigorous regulatory requirements for drug development, clinical trials and marketing. The cost of navigating this regulatory landscape is often prohibitive, which can lead to delays in bringing products to market or even abandonment of promising projects.

2. **Lengthy development timelines**: Developing a new drug or medical device is a long and costly process, often taking a decade or more from initial discovery to commercialization. This extended timeline increases the risk of failure and limits the number of potential new products that can be brought to market.

3. **High failure rates:** The failure rate for drugs in clinical development is high, with estimates ranging from 80% to 95%. This means that the vast majority of drugs that enter clinical development will ultimately fail, further driving up the cost of successful products.

4. **Limited understanding of disease biology:** Despite significant advances in our understanding of the biology of disease, there is still much that is unknown. This lack of understanding makes it difficult to identify new drug targets and develop effective treatments.

5. **Limited patient engagement:** Historically, the pharma industry has had limited engagement with patients and other stakeholders in the drug development process. This has resulted in a lack of understanding of patient needs and preferences, which can lead to suboptimal product design and ultimately limit adoption and commercial success.

significantly lower than the average ROI of 9.6% for the technology industry and 6.5% for the consumer goods industry during the same period.

These statistics highlight the significant challenge that the pharma industry faces in realizing returns on its investment in R&D. The low ROI makes it difficult for companies to attract funding for new R&D initiatives, and it also raises questions about the sustainability of the current R&D model.

Pharma companies face significant financial pressures due to the high cost of R&D, long development times and the uncertainty of success for new drug candidates. Moreover, the industry is subject to intense regulatory scrutiny, with strict requirements for safety and efficacy testing before drugs can be approved for use.

While it is true that regulatory requirements can be complex and time-consuming, it is important to recognize that other industries face similar challenges and still manage to achieve strong returns on innovation investment. Therefore, regulatory aspects cannot solely be used as a rationale for poor performance in the pharma industry.

Furthermore, studies have shown that a lack of innovation and inefficient R&D processes — rather than regulatory constraints — are often the root cause for poor financial performance in pharma companies. For example, McKinsey & Company found that the top-performing pharma companies were able to effectively navigate the regulatory landscape while also maintaining a strong focus on innovation and efficiency.[3]

Therefore, it is crucial for pharma companies to adopt new approaches and methodologies to improve their R&D performance and achieve better financial returns, while still meeting regulatory requirements.

In order to address R&D performance, pharma needs to take a closer look at techniques that have proven effective in other industries.

It is imperative for stakeholders in the industry to prioritize and invest in a multifaceted approach to R&D improvement.

Lean development as a solution

One potential solution is at the intersection of lean development methods with AI, which can help companies streamline their R&D processes and achieve greater efficiency and drive more effective innovation.

We suggest the companies explore three specific areas that are crucial to addressing the challenges faced by the pharma industry in realizing better returns on its R&D investments. These areas include:

1. **Leveraging lean development methods:** Adopting lean development methods could significantly improve the efficiency and effectiveness of R&D in pharma, leading to more reliable outcomes and faster time to market.
2. **Embracing a culture of set-based experimentation:** The ability to experiment and iterate quickly is critical to innovation, and pharma companies need to cultivate a culture of experimentation to achieve better outcomes.
3. **Strengthening collaboration and knowledge sharing**: R&D in pharma is a highly collaborative process that often involves teams across multiple locations and organizations. Improving collaboration can create reusable knowledge, and knowledge sharing can lead to better outcomes.

The traditional approach to drug development in the pharma industry has been characterized by a linear, sequential process that can be slow and inefficient. This approach can result in a significant amount of time and money being invested in compounds that ultimately fail to make it to market.

Instead, we propose a multifaceted approach that focuses on three key areas:

1. **Reducing time to market:** One of the primary ways to improve the return on investment in R&D is to reduce the time it takes to bring a drug to market. This can be achieved through the use of more agile and flexible development methodologies, such as lean development and agile methodology, that prioritize speed and efficiency.
2. **Increasing throughput**: Another key area of focus is increasing the throughput of the drug development process. This can be achieved through the use of automation and other technologies that can help to streamline the drug development process, reducing the time and cost required to bring a new drug to market.
3. **Improving uncertainties associated with the development stream:** Finally, we propose improving the uncertainties associated with the development stream, including improving the predictability of drug development outcomes, reducing the likelihood of late-stage failures, and increasing the success rate of clinical trials. This can be achieved through the use of new technologies such as machine learning and AI, which can help to improve the predictability of drug development outcomes and identify potential issues earlier in the development process.

By focusing on these key areas, we believe that it is possible to significantly improve the return on investment in R&D in the pharma industry, while also bringing much-needed therapies to patients more quickly and efficiently.

A call to action

With the growing need for innovative therapies to address unmet medical needs, there is an urgent need for the pharma industry to improve its R&D processes.

While there are multiple factors contributing to the poor returns on pharma R&D, there are also promising solutions available, including lean development methods. Reducing time to market, increasing throughput, and improving uncertainties associated with the development stream are crucial areas of focus.

It is imperative for stakeholders in the industry to prioritize and invest in a multifaceted approach to R&D improvement. This includes adopting more efficient and effective development methods, leveraging data and technology to enhance decision-making, improving collaboration between industry partners and addressing regulatory challenges.

Therefore, we call on leaders in the pharma industry to take action and invest in R&D improvement. This requires a commitment to change, a willingness to embrace new approaches, and a recognition of the long-term benefits that will result from such investment. By doing so, we can help ensure the future success and sustainability of the pharma industry.

References

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2 *Hirshleifer, D., Hsu, P. H., & Li, D. Innovative efficiency and stock returns. Journal of Financial Economics. (2013).*

3 *Pharma's next challenge: Delivering on product launch excellence. McKinsey & Company. (2018).*