## **EVALUESERVE**

# Digital Disruption in Pharma Industry

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## Contributors



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## **Overview**

The pharma industry has been relatively slow in embracing digital technologies and this is due to cautious approach in adopting them, given the stringent regulatory requirements which companies feel would be compromised when using digital.

However, the face of healthcare is changing, and digital solutions have the potential to benefit stakeholders across value chain by attaining 'triple aim' of providing a **better care experience, increasing health outcomes and lowering per capita costs** 

### **Key Statistics**

- **74%** pharma companies reported to have paced up digital efforts in response to the pandemic
- **\$4.5bn** spend on digital transformation in pharma industry anticipated by 2030
- **20%** of biopharma companies are digitally maturing

#### Key Drivers

- Shift from strong product focus to customer focus
- Need for better data on medication efficacy and patient QoL
- Complex regulatory requirements
- Increasing operational challenges

#### Key Barriers

- Price and cost pressure
- Cybersecurity
- Compliance to regulatory requirements
- Building new competence and experience
- Resources for digital engagement

## **Key Trends**

With multitude of disruptive technologies, digital transformation holds immense potential to drive improved outcomes, streamline operations and ultimately transform the way healthcare is delivered



Source: 1. Hole G 2022 2. Meco.com 3. Digitization in pharma 4. Deloitte Survey 5. Controlant.com 2023 6. Hjalm M 2022 7. Pharmaceutical Technology 2022 8. Digital Transformation in Pharma 2022 9. Global Data

# **Digitalization Across Pharma Value Chain**

Digitalization has improved the efficiency, speed, accuracy, and accessibility of various processes in the pharmaceutical value chain, leading to **better patient outcomes**, **reduced costs**, and **increased innovation in the industry** 



This report briefly outlines digitalization trends in A. Drug Discovery, B. Clinical Trials, and C. Commercial & Patient Support

# **Digitalization in Drug Discovery & Research**

Digital transformation has led to

- Significant reduction in R&D costs
- Shortened drug discovery timelines
- More accurate and more efficient target identification



Reduction in hit identification and candidate compound selection time leveraging AI & Robotics for R&D

## Finding and optimizing target proteins

1

- Molecular modelling enables synthesis chemists to concentrate on the most promising drug candidates
- Modern measurement techniques are leveraged for making digitally calculated predictions

#### X-ray structure analysis to disclose 3D structure

2

- Researchers determine exact molecular structure of target protein using X-ray structure analysis before they begin in-silico research
- The above is used for refining the image until researchers can see precise 3D structure of target molecule

#### In-silico drug discovery

3

- Scientists use virtual compound libraries to search molecules whose structure fits the target molecule's binding pockets
- Drug candidates found digitally are then either produced by synthesis chemists in labs

## Digital forecasts to improve success rates

- Enabling improvement in lead compound's suitability by digitally calculating what changes could enhance drug candidate's binding affinity
- Also used to calculate in advance any biophysical or toxic properties that would result from certain structural changes

# **Digitalization in Clinical Trials (1/2)**

- Rising cost of running a trial, commercial risks of failure and patient inconvenience is driving the adoption of new technologies to catalyze digital transformation of clinical trials
- "Digital Clinical Trial" leverages digital technology to capture the study data and manage end-to-end clinical trial solutions. For ex video visits, eConsent, Electronic Patient Reported Outcome assessments and Digital Sensors and Monitoring Devices

## Percentage reduction in trial costs leveraging digital tools



#### **Digitalization across stages of clinical trials**



# **Digitalization in Clinical Trials (2/2)**

Study design and setup	Patient recruitment and retention	Data collection	Digital analytics
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<ul> <li>Candidates and sponsors network establishment to match needs and patients' conditions</li> <li>Clinical trial protocols creation by data retrieval from existing publications or previous protocol</li> <li>Evidence-driven site selection, Unstructured clinical data analysis (doctor's notes, pathology reports, operating notes, Electronic Health Record EHRs, etc.)</li> <li>Informed consent using visual formats and creation of more effective, tailored communication strategies to overcome barriers, such as mistrust, access and fear of human</li> </ul>	<ul> <li>Potential participant access to the trial regardless of their geographical location (e.g., decentralized clinical trials)</li> <li>Negation of any difficulty reaching to study sites such as for older adults with mobility problems</li> <li>Digital creation and online tracking of applications, assessments and electronic informed consent</li> <li>Data capture by wearable devices and remote monitoring systems</li> <li>Reduced time and travel burden via virtual clinical visits</li> </ul>	<ul> <li>Use of cloud-enabled technology to maintain strong, scalable and agile data management and compliance for trials</li> <li>Use of data lakes for automatic processing of raw data from multiple sources</li> <li>Real world data capture and storage using VR, sensors and wearables</li> <li>Digital access of biomarker data to provide detailed physiological process information to inform diagnostics, dosing titration and endpoints for trials</li> </ul>	<ul> <li>Faster real-time data analysis by embedding machine learning and artificial intelligence algorithms into trial processes</li> <li>Advanced understanding of data to draw insights to make better drug and medical device development decisions that are science-led and data-powered</li> <li>Insights allow the early signs of a trial to be detected, any problems solved in real-time and continuous monitoring of the data and not just when the trial is finished</li> </ul>
experimentation		i	

# **Digitalization in Product Commercialization**



Source: 1. Troy M et al 2021 2. Digital Marketing Institute 2019 3. Thompson D 2022 4. Bach LG 2022 5. Murray L 2023 6. Jotform.com 2023 7. Lilly PR Nov 2022 8. The Migraine Experience 9. People.com 2018 10. Evermed.com 2022 11. Vaimo.com 2022

# **Key Challenges and Future Opportunities**

With advent of digital transformation, boundaries between the physical and virtual world have blurred more than ever before and present myriad of opportunities to unlock full potential for end-users in the pharmaceutical industry

Challenges	Resistance to digitalize and risk-averseness	Cybersecurity issues as pharma companies move their high value data online	Increased demand for pharmaceutical companies to remain at the forefront of digital innovation	Integration and interoperability among different cross- functional stakeholders of biopharma organizations
<b>Opportunities</b>	<ul> <li>Leaders and end user involvement in setting company-wide goals to encourage adoption and success</li> <li>Knowledge of fundamentals of how digital innovation can be deployed to support the needs of the enterprise to overcome resistance</li> </ul>	<ul> <li>Layered defence approach which combines foundational protection, innovative tools and security culture</li> <li>Workforce education to provide greater insight into possible security risks before they can occur</li> </ul>	<ul> <li>Setting up Continuous Monitoring Programs and attending Digital Health Conferences to stay abreast on the latest advancements, evolving trends and network with experts.</li> <li>Constant awareness and development of organizational mindset towards adopting digitalized approaches for process optimization and efficiencies</li> </ul>	<ul> <li>Implementation of integrated knowledge sources and centralized knowledge hubs to break silos and promote collaborative outlook</li> <li>Optimization of knowledge outcomes from cross-functional teams enabling faster decision making and strategic actions</li> </ul>



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