



# *DoloCon Pharma Company*

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# Executive Summary - 1/2

## Industry Outlook (Bloomberg)

Market is expected to grow at a **CAGR of 5.70%** and in terms of revenue \$ 1482.4 mn in 2021 and is projected to reach USD 2067.35 mn by 2028.

Aging population, personalized medicine, and chronic diseases are **Key Growth Drivers**

**Drugs** led the market in **Dominant Segment** and **Metabolic** disease meds dominated the **Top Application sector** in FY'2021.

**North America** dominated the pharmaceutical market in 2021.



**+15.5%** increase in global pharmaceutical revenues in 2021



**24%** increase in global population to reach 9.7bn by 2050



**53%** avg new product approvals by FDA between '18 & '21

## Competitors



**Johnson & Johnson**



AstraZeneca



**NOVARTIS**



**Bristol Myers Squibb™**

## Pharmaceutical Market Segmentation

**API Type Analysis**  
(Different APIs lead to distinct drug formulations and therapeutic effects)

**Drug Type Analysis**  
(Prescription and Over-the-Counter (OTC) drugs, and OTC do not require professional's prescription)

**Customer Base Type Analysis**  
(Classifies based on target customer groups, Differentiated marketing strategies for professionals & consumers)

**Application Analysis**  
(Medical specialties for treatment focus & Categories like oncology, cardiovascular, metabolic diseases, etc.)

## Pharmaceutical Industry Dynamics (Bloomberg)

### Growth Drivers

High-tech solutions boost pharmaceutical market growth amid challenges

Cloud, AI, ML enhance drug development, treatment decisions and health data helping to improve the manufacturing cycle

### Growth Restraints

High manufacturing expenses limit pharmaceutical market expansion.

Quality Control Crucial: Delicate biologic therapies require meticulous handling, precise production.

Biologics entail intricate R&D, costly testing, low success rate.

## Risk & Opportunities of Industry

### Risk

Lack of skilled labor

Increasing regulation

Strong competitions

Outsourcing of low volume & complex drug

Governmental healthcare cost containment

Brand Management

### Opportunities

Increasing Outsourcing

Technological Advancements

Increasing number of small & medium size companies

New Operational Technique

New operational techniques

Personalized Medicine

Customized Care

# Executive Summary – 2/2

## CDMO Market by Region

Region	Market size (Bn \$)		CAGR (%)
	FY'18	FY'25	
North America	\$ 24.7 bn	\$ 34.4 bn	4.8%
Europe	\$ 16.5 bn	\$ 22.9 bn	4.8%
Asia Pacific	\$ 44.1 bn	\$ 80.1 bn	<b>8.9%</b>
Middle East & Africa	\$ 4.4 bn	\$ 6.4 bn	5.5%
Latin America	\$ 9.0 bn	\$ 13.9 bn	<b>6.4%</b>

# Pharma Industry 4.0 Revolution

**Cost-Effective Solution:** Industry 4.0 adoption transforms pharma manufacturing, enhances quality, reduces costs.

**Data-Driven Efficiency:** Autonomous factories with ML cut costs, improve quality, reduce constraints.

**Industry 4.0 Momentum:** Pharma embraces smart manufacturing for competitiveness, despite initial hesitations.

**20% Savings:** Smart factories to yield substantial savings, enhance quality, ensure reliability.



## *Reduction of non quality pharma manufacturing costs*



*Reduction of cost  
converting raw  
materials into drugs*



*Increase in delivery reliability (on time, right quantity, right quality)*

# Pharma Industry Future

**Production Overview:** Production performance manager offers holistic view, identifies issues promptly.

**Predictive Maintenance:** Analytics predict breakdowns, reduce losses, cut maintenance costs effectively.

**Efficient Changeovers:** Advanced changeover support via VR accelerates product transitions, reduces downtime.

**Predictive Quality Management:** Advanced analytics detect potential defects to enhance quality control.

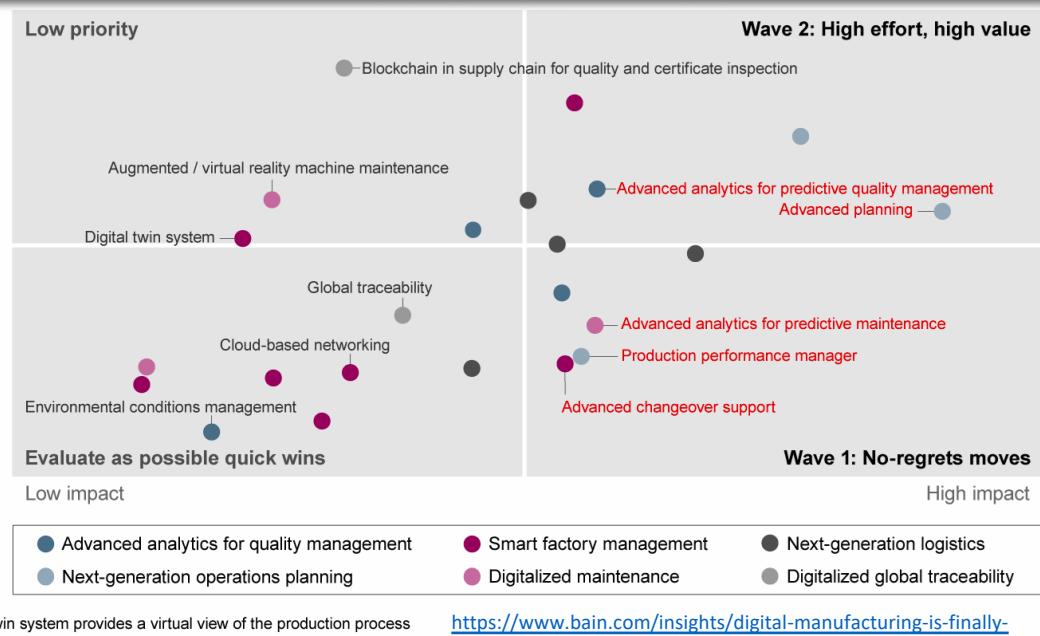
**Pattern Recognition:** Identifies production, packaging, and logistics patterns linked to quality issues.

**Big Data Insights:** Historical data aids demand management, reduces inventory, optimizes production schedules.

**Resource Optimization:** Advanced planning ensures right resources, inventory, and order sequence for output

Harder to implement

Easier to  
implement



Note: Digital twin system provides a virtual view of the production process  
Source: Bain & Company Pharma 4.0 Survey, 2019 (n=25)

<https://www.bain.com/insights/digital-manufacturing-is-finally-coming-to-pharma/>

# Technological Advancement - 1/2

## Key Pharma Tech Trends to 2024



...of pharma executives say these **technologies will matter most** over the **next 5 years**

Big Data & Analytics

Cybersecurity

Cloud computing Services

## AI/ML in R&D Process

Drug Discovery

- Protein Structure Prediction:** Alpha Fold's DL approach predicts 3D protein structure accurately.
- Drug Repurposing:** ML identifies FDA-approved drugs with potential against SARS-CoV-2.

Translational Research/Precision Medicine

- Patient Stratification:** ML-derived biomarkers aid patient classification, treatment customization, and efficacy.
- Dose Finding:** Bayesian nonparametric learning optimizes dose selection, accelerates oncology trials.

Clinical Trial Design and Analysis

- Bayesian Learning:** Nonparametric models enhance oncology trial design, especially in complex cases.
- Master Protocols:** Flexible Bayesian nonparametric learning accelerates basket, umbrella, platform trials.

Precision Medicine

- Probabilistic Models:** ML builds patient-target match, enhances success prediction, and patient benefit.
- Subgroup Clustering:** Unsupervised learning identifies varying levels of treatment benefit, improving precision medicine.

AI/ML-Assisted Clinical Trial Oversight

- Enhanced Monitoring:** AI-driven RBM improves trial site performance tracking, data quality oversight.
- Smart Monitoring:** Real-time ML-based checks optimize site performance, data accuracy, and patient safety.

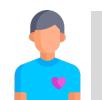
## AI/ML in Drug Development Process

Particulars	Traditional Methods	ML	DL/ AI
Clinical Trial Data Analysis	Ph 1 – 4 trials focus on interference or estimation of Trt effects		
	Ph 0 Trials		
	Small – Medium Dimensional data for evidence Generation & Translational Research		
	High Dimensional Translational data focuses on prediction		
Translational Research or Drug Discovery Data Analysis	Small – Medium Dimensional data		
	High Dimensional data		
Development of Systems	System with Human-like reasoning to optimize drug development process (e.g. manufacturing or trial operational)		

## Benefits



R&D Revolutionize



Patient Recruitment Boost



Efficiency Transformation



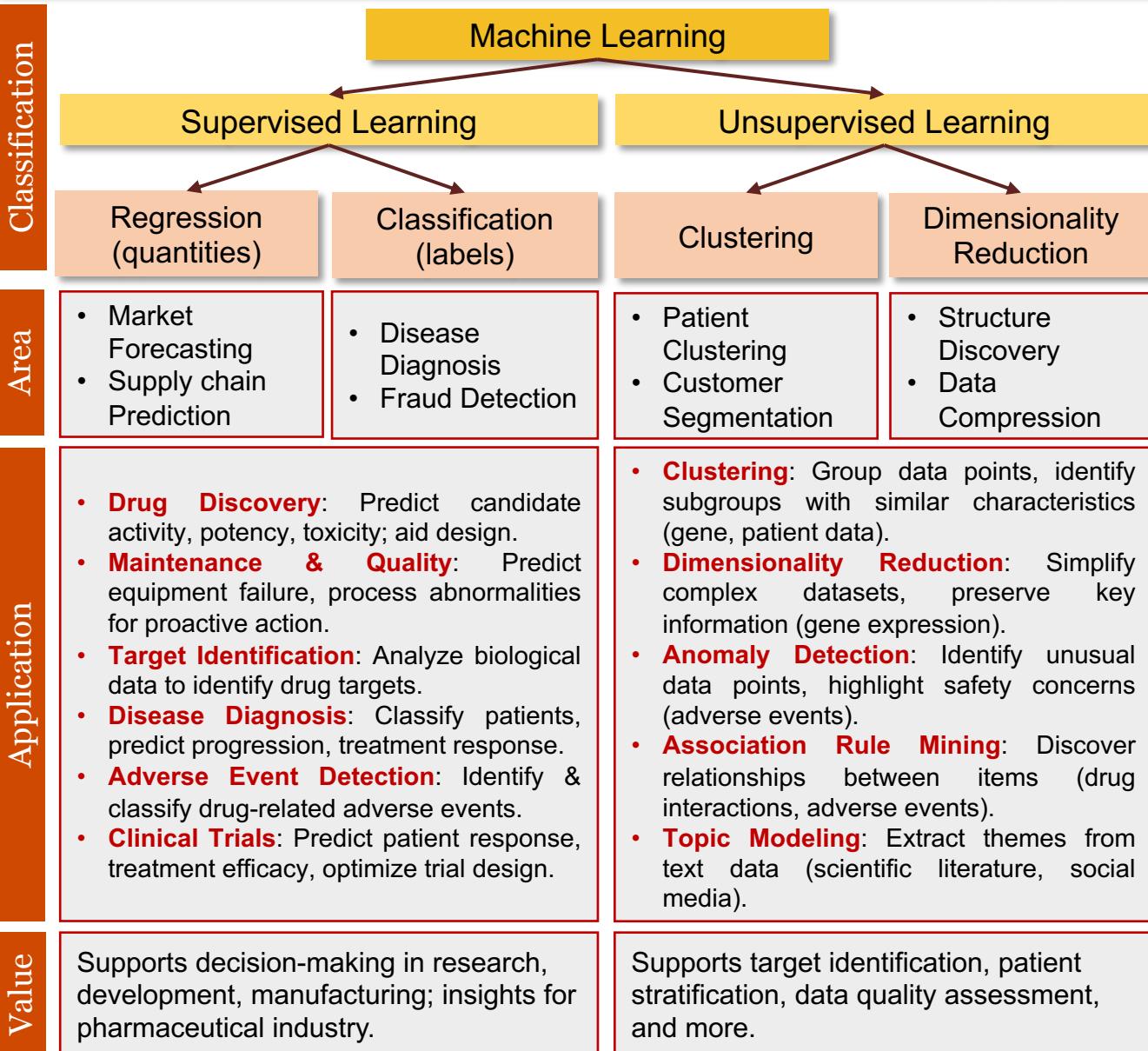
Clinical Trial Evolution



Quality Enhancement

# Technological Advancement – 2/2

## AI & ML's Application in Pharma



## Limitations of AI/ML in Drug Development



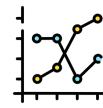
**Lack of Transparency:** AI models are complex "black boxes," making it difficult to understand their decision-making process and gain regulatory approval. Lack of transparency can also lead to mistrust in predictions.



**Limited Data Availability:** AI models require substantial data, but rare diseases or insufficient data can lead to biased or inaccurate results. Data representativeness is crucial for avoiding bias.



**Inability to Incorporate New Data:** Updating AI models with new data is challenging, leading to outdated or inaccurate predictions over time.



**Limited Ability to Account for Variability:** AI models may struggle with predicting responses for individuals whose characteristics deviate from average data.



**Interpretation of Results:** Complex AI outputs can be challenging to interpret, making it difficult to understand & utilize predictions effectively.



**Ethical Considerations:** Patient privacy, data ownership, & regulatory compliance pose ethical challenges in AI-based drug development.



**Complex Biological Systems:** AI models may struggle to accurately represent the complexity and dynamic nature of biological systems.



**Lack of Clinical Expertise:** AI's statistical approach may not capture the nuanced factors that influence individual patient therapies.



**Inactive Molecules:** AI simulations predicting molecule-protein binding interactions can lead to false-positive or false-negative results due to limitations in modeling accuracy and flexibility.

# Setup Outsourcing of API in India

## Europe's supply of active pharmaceutical ingredients (API)

2/3 of the currently **valid CEPs** for APIs are held by **Asian manufacturers**

**Only 33%** of CEPs for APIs required in Europe are held by **European manufacturers**.  
**More than 50%** of all CEPs are held by **Indian and Chinese manufacturers**

Main reasons for the CEP migration to Asia are **price pressure** and **less rigid regulatory requirements** in **Asia**

**For 93 APIs** required in Europe there are **no CEPs in Europe**

Manufacturers' product portfolios differ between India and China. **Indian manufacturers** tend to be **larger** and **more focused on high-volume APIs**

## India's API industry

**3rd largest API producer** globally, contributing **8%** to the **overall industry**

Manufacturing over **500 different APIs**

Prequalified list of the World Health Organization (WHO) stands at **57% of APIs**

Projected **CAGR of 13.7%** in the next four years

India benefits from a robust domestic market, advanced chemical industry, skilled workforce, stringent quality standards, and comparatively **lower costs** (~40% less than Western countries) for establishing and operating modern API manufacturing plants.

## Feasibility to shift API manufacturing in India



### Established ecosystem to support pharma manufacturing:

Indian manufacturing infrastructure has evolved from export of simple APIs to becoming one of the largest generic drug exporters to global markets



### Government initiatives & Regulatory Landscape:

- Government initiatives like New Drug and Clinical Trial Rules, 2019, easing of FDI norms and Make in India to support local manufacturing.
- Provide a 12% subsidy on the overall production value with minimum investment value (~INR 100 crore) in any project and a minimum production value (~INR 250 crore) by the third year of operation. Cost of electricity and water to be cut by 50% for 5 years.



### Risk and Challenges:

Overreliance on China exposes Indian pharmaceutical industry to supply disruptions and price volatility.



### Lower manufacturing cost:

~33% lower manufacturing cost than that of the U.S. and half of Europe enables India to manufacture high-quality medicines at competitive prices.



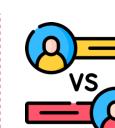
### Large pool of qualified personnel:

India has a large, growing trained and skilled workforce to support the establishment of large-scale pharmaceutical manufacturing projects.



### Provide faster environment clearance:

The approval process could be brought down to 2 months from 4–6 months. Deep sea discharge norms to be in line with global best practices.



### Competition in Potential Markets::

China's API industry has inherent advantages such as economies of scale, financial incentives, and lower costs.

# Future Plan of Company

## CFO's Planning

	FY1	FY2	FY3
<b>One time tech Development cost</b>	50,000	-	-
Symptom Checker	50,000	-	-
ChatBot	1000000	-	-
Cost of implementing AI in drug discovery and testing			
Maintenance Cost of tech @20%	220000	220000	220000
<b>Annual Costs</b>			
A/B testing	36,000	36,000	36,000
Machine Learning Cost	55,000	55,000	55,000
Industrial IoT Cost	50,000	50,000	50,000
Data Management Platform	65,000	65,000	65,000
Big Data Analysis	14,000	14,000	14,000
<b>Plant set up cost</b>			
India	-	-	400,000
Africa	-	-	1600000
Germany			

## CEO's Future Plan

**1. Operating Model Evolution:** Pharma rethinks decentralized structures; explores globalizing operations for scaling efficiency. Centralization gains traction, aided by tech-driven outsourcing.

**5. Enhancing Decision-Making:** Infuse analytics into business for better judgement. Value-based planning offers up to 20% budget flexibility post-cost transformations.

**2. New Leadership Role:** Introducing Global Enabling Operations Officer (EO2); oversees tech-powered managed services. Partnerships and cost-effective internal centers augment support.

**4. Driving Growth and Differentiation:** PwC's fit-for-growth approach empowers pharma with strategic transformation. Balances growth, returns, and increased patient access to medications.

**3. Governance Transformation: Decision-making adapts to dual priorities:** speed and quality. Leadership alignment, real-time analytics, simplification methods, frontline empowerment enhance agility and accountability.

# 3 Year Roadmap

Tech

Ops

Capex

Marketing & Sales

## Year 1

- Patient Stratification:** ML-derived biomarkers aid patient classification and treatment customization (**precision medicine**)
- Dose Finding:** Bayesian nonparametric learning optimizes dose selection, accelerates oncology trials

## Year 2

- Clinical Trial Design and Analysis:** Nonparametric models enhance oncology trial design, especially in complex cases
- Master Protocols:** Flexible Bayesian nonparametric learning accelerates basket, umbrella, platform trials

## Year 3

- Probabilistic Models:** ML builds patient-target match, enhances success prediction, and patient benefit (**precision medicine**)
- Subgroup Clustering:** Unsupervised learning identifies varying levels of treatment benefit, improving precision medicine

- Major focus on **improving the existing supply chain & optimizing the capital expenditure**
- Use digital technologies like **Vendor Management Systems, Blockchain for contract maintenance and Industrial IOT (WIP)**
- Industrial IOT will be started this year**

- Optimization of retail and transportation network**
- Usage of **route optimization softwares like Locus** to cut down on transportation expenditure
- Look towards **international expansion**
- Only retail expansion will be here**

- Focus on market expansion by establishing **manufacturing facilities for APIs in Africa, Germany and India**
- Expected time for the **industrial IOT to get integrated into the system** and benefits would be established
- Some benefits will be materialized

- \$ 1540000**
- There is a **one time development cost for technology** and maintenance cost for these technologies as **20% based on the industry average (15-25%)**

- \$ 440000**
- In the second year, there is not a huge capex. It is only the **maintenance cost for technology and annual cost of various AI based interventions**

- \$ 38440000**
- The capex is huge here because of the plant set up cost, which as written above planned to be set up in the third year at the said locations (Germany, Africa and India)

- ATL Marketing through GenAI and ML**
- Personalized Advertisements through Big Data analytics & ML**
- A/B Testing and **Big Data Analytics** to promote customer retention
- Using **Data Management Platforms** to achieve targeted insights about the customer

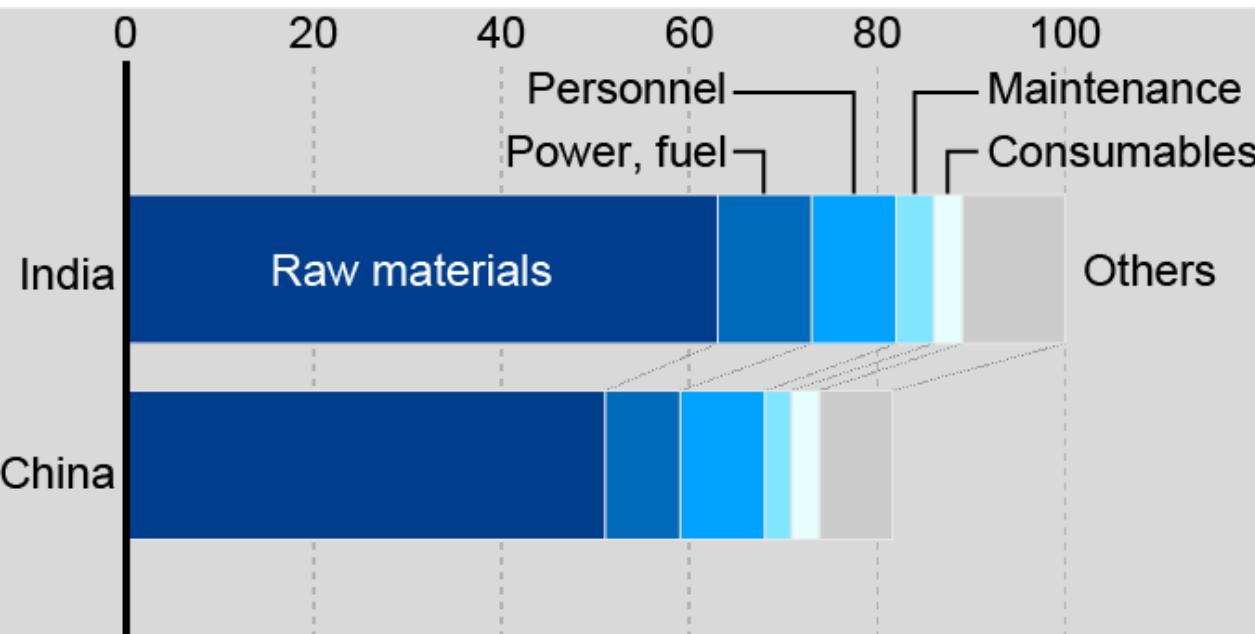
- Launching HealthMate** for symptom checking, medical image analysis and prioritizing patient care based on severity of disease
- AI based chatbot** and symptom checker through Natural Language Processing called **“Dr Bot”**, which would reduce the dependence on manual intervention

- Performance testing** for the above launched initiatives to check if the goals are being met
- Feedback collection through surveys**
- Impact Analysis** of the marketing campaigns and benefits realized for the stakeholders, which includes financial projections and deviations

# Capex and Financial Planning

## Comparing API's Price in India vs China vs Africa

### Phase - 1

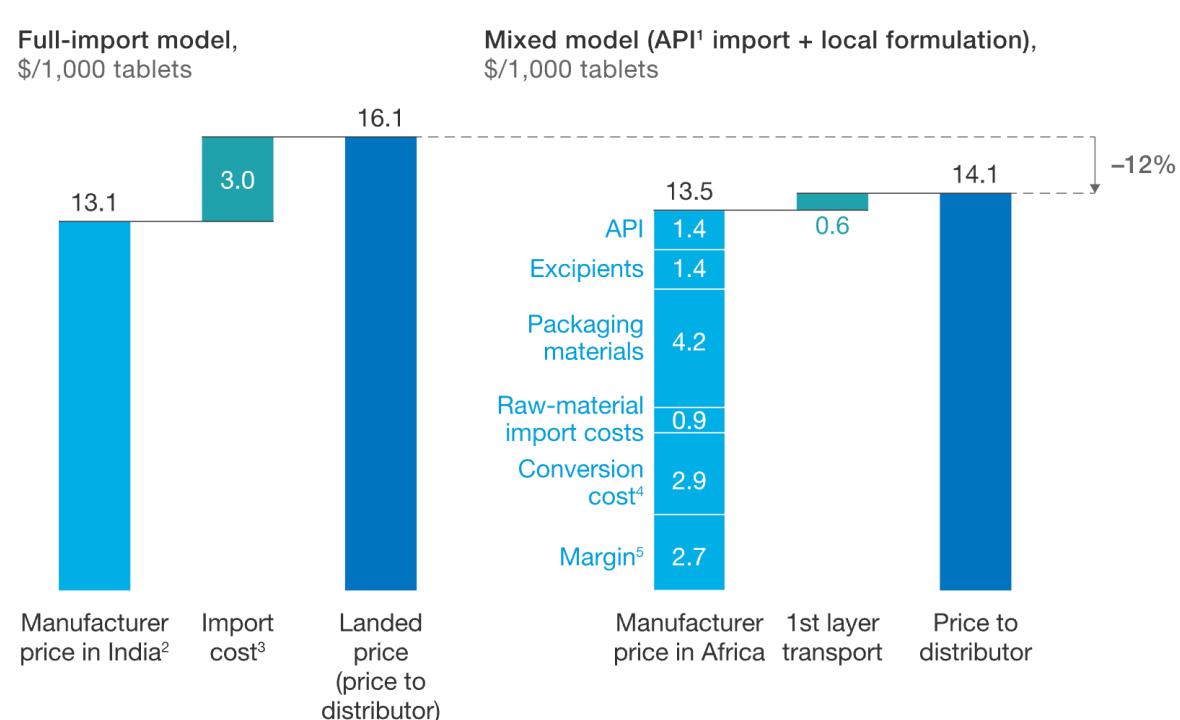


**China enjoys an API production cost advantage**

When it comes to API prices, China has a significant edge. According to KPMG India's research, a drug generally can be produced for 20% less in China than in India. This is largely thanks to cheaper raw materials, which can be up to two-thirds of the total production cost. (API production total cost breakdown; India = 100 (in percent))

**Suggestion:** To reduce complete dependency on China based supplier, DoloCon has to shift its **50% supplier base from China to India**. This will **increase the API outsourcing cost by 10-12% approx.**

### Phase - 2



**DoloCon will start new manufacturing plant in Africa and purchase APIs from local suppliers.**

In phase 2, Dolocon will start manufacturing plant of drugs in Africa & for this they will buy APIs from local suppliers, which will reduce overall cost be approx. 12%.

**Suggestion:** To reduce complete dependency on China and India based supplier, DoloCon has to shift its **20% supplier base to Africa**. This will **increase the API outsourcing cost by 10-12% approx.**

# Targeting new markets- Operations POV

## Targeting new markets

### Supply of API

Proposal to make a manufacturing plant for APIs in the following countries (it is necessary to maintain a mix of suppliers in all the three countries to prevent hassles)

#### Africa, India, Germany

This decision is based on following country specific advantages

##### Africa

- Public **private partnerships** and **supportive governmental policies**
- Greater healthcare **awareness** and **rising disease burden**
- **Emerging market growth**

##### India

- The **largest producer** of **generic medicines** in the world
- **Skilled workforce**
- Competitive manufacturing **costs**

##### Germany

- Stringent **quality** and **regulatory standards**

### Manufacturing of medicines

- The existing facilities for the company, DoloCon are present in France and Switzerland
- The manufacturing hub will serve as a **mother hub**, that will send the APIs to the manufacturing facilities of the medicines (**child hub**)
- We can leverage digital technology here and deploy a route optimization software to determine which mother hub will serve which child hubs to minimize the transportation costs



#### Benefits

- **Automated process** are more efficient
- **Lower transportation costs**
- Expansion into new markets
- Owning a major share of the **supply chain reduces dependency**

#### Potential Risks

- Regulatory considerations
- Economic health of the country
- Access to **resources at cheap rate**
- Easy of doing business

### Transportation

- The following things need to be kept in mind before designing the transportation schedule and route:

- **Regulatory compliance:** DoloCon needs to do a thorough research on regulatory practices in the country
- **Product stability and temperature control:** Some medicines require a specific temperature to remain stable, which must be there during transportation also
- **Transportation mode:** Preferred modes will mostly be either air or sea
- Customs and import procedures
- **Insurance:** Proper insurance with suitable T&C
- Risk management
- **Security measures:** To prevent in-transit theft
- Visibility



#### Potential Risks

- **Transportation rules** across countries will have to be considered
- The countries need to have **good political relationships**

### Distribution and retail

- The steps that DoloCon needs to follow before establishing its retail network outside Europe are:

- **Market research and selection:** Identify a profitable market or segment to target for the medicines
- **Market entry strategy:** Have a well-defined strategy for market entry to displace competition
- **Local partnerships:** Explore the possibility of tie-ups with local brands to prevent high capital expenditure
- **Competitive Landscape assessment:** Do an appropriate assessment of competition before
- **Financial planning:** Revenue, and break even analysis
- **Talent acquisition and training:** Identify and recruit talent that can add value



#### Potential Risks

- **Regulatory** considerations
- Economic health of the country
- Consumer behavior and preferences
- **Competitive** retaliation

# Digital Transformation (Operations)- 1/2

## Demands

Increasing the **channel penetration**



Implementation of the **optimal distribution strategy**



Building a **resilient supply chain**



**30% increase** in the **revenue** in the next **3-5 years**



Exploring ways to introduce **AI** in **scheduling and planning**

## Problems Faced

Fragile global/local supply chain



Dependence on supply of APIs

Lack of qualified workforce



Quality assurance and control

Regulatory pressures



Lack of a stable pricing policy



Demand forecasting

Risk management

## Pharma Industry Supply Chain

### Supplier

(DoloCon has external suppliers to supply the APIs)



### Manufacturing of Drugs

(uses internal services for manufacturing)



### Distribution

(Transportation of drugs to the distribution site)



### Retailers & Chemists

(The mother hub can then send the drugs to the small retailers)



### End Consumer

(End user through their local chemist or online platforms)

## Advantages of Digital Transformation

Improving the **process efficiency** and ensuring automation leads to a low error percentage

Reducing the **time and cost spent** on bringing a **new drug** to the market

Ensuring **quality control and compliance** to the standard protocol

Digitization ensures that we can maintain a **proper record of the regulatory compliances**

Increasing the **visibility** of the supply chain

Enabling **predictive maintenance**

Enabling **remote monitoring**

Bolsters **sustainable operations** through optimization of resources

# Digital Transformation (Operations)- 2/2

## Technological Solutions

### Manufacturing

**Problem-** Shortage of the chemical compounds to manufacture APIs  
**Solution-** Industrial IOT and data transfer for remote monitoring

**Problem-** Supplier specific problem  
**Solution-** Digital vendor management and performance benchmarking

**Problem-** Has the entire process of manufacturing the API undergone some change?  
**Solution-** Digital Manufacturing and automation

### Logistics

**Problem-** Geopolitical tension have led to a rise in transportation cost  
**Solution-** AI to predict which routes might get impacted

**Problem-** Complete halt in the trade  
**Solution-** Technologies like ML can be considered to explore alternate trade routes

**Problem-** Demand and supply mismatch  
**Solution-** Statistical analysis tools to predict demand

### Distribution and Inventory

**Problem-** Vendor specific problem  
**Solution-** Digital vendor management softwares and performance benchmarking

**Problem-** Inventory pileup or stockout  
**Solution-** Inventory Management Systems to ensure visibility and preventive actions

**Problem-** Local problems (civil unrest)  
**Solution-** Digital solutions would not be present

### Retail

**Problem-** Lockdown or similar problems leading to supply demand mismatch  
**Solution-** Predictive analytics and storing alternate business plans on the cloud

**Problem-** Delivery challenges to the customer (last mile)  
**Solution-** Route optimization like Road Warrior

**Problem-** Increased cost of delivery  
**Solution-** No digital solutions

### Consumer Behaviour

**Problem-** Change in consumption pattern of the generic and patented drugs  
**Solution-** Big data analytics

**Problem-** Shift in the trade channel preference of the customers (E-commerce)  
**Solution-** E-commerce and Natural Language Processing

**Problem-** Shifting to new retailer/supplier  
**Solution-** Leveraging the Metaverse to make the customer journey more interactive

## Increasing Channel Penetration



Conventional **access to the retailers/chemists** has become more cumbersome with the Covid-19 pandemic?

**Adopting analytics in commercial models** and creating **customer value** through an **omnichannel commercial model**



### What is the analytics-driven omnichannel retail in pharma

Data analytics to collect the store data like customer profiles and transaction history

Personalization of marketing messages and product suggestions

Providing a seamless physical shopping experience

Feedback and improvements to continuously remove any customer pain points

Customer engagement through loyalty programs, and personalized offers

Providing the click and collect feature at the brick and mortar store



**5-10%** higher customer satisfaction  
**10-20%** cost savings

**5-10%** uplift in potential revenue  
**3-5%** increase in subscribers



## Expanding the offerings for attracting Doctors

**Objective:** To establish a strong brand image in order to become a preferred pharma company for both the doctors and the patients

### HealthMate



- Launching HealthMate, an **AI based assistant** curated just **for the doctors** in order to **increase the time available** with the doctor to devote to the **patients**.



- **Symptom Checking-** HealthMate will be feeded with all the journals and research that has been conducted in order to help identify a disease based on symptoms. This will help doctors in faster identification of the diseases, avoid any mis-identification and accurately diagnose illness. This database will be regularly updated so that the doctors are aware of the recent research. Development of this symptom checker would require using Machine learning.



- **Administrative tasks-** Regular tasks like data entry, appointment scheduling, etc can be done through AI. Automation of these tasks not only reduces human errors but also frees up more time at hand.



- **Prioritization of patients to identify the one most in need-** A patient's risk score can be calculated using their past data like medications used, external data like the level of pollution of the city they reside in, etc. On the basis of this risk score along with reasoning provided by the AI, patients will be ranked to identify those most in need. This will help care managers to optimize their time. Additionally, care for patient will improve over time as more data about their activity is feeded into model.



- **Medical image analysis-** HealthMate will use deep learning in order to help doctor make more accurate diagnosis by providing minute interpretations from the images of patients like X-rays, CT scans, etc, otherwise getting missed by the doctors.

### Pricing of HealthMate



- HealthMate's price would be on an **annual subscription basis**.
- A **loyalty program** would be integrated in the same wherein the **doctors recommending** our medicines would get **extra discount** on this software.

### Promotion of HealthMate



- HealthMate would be positioned as a **Doctor's personal assistance** and a **one stop solution** to help the patients in the best way possible.



- For the same, **direct selling** would be used initially wherein **salesperson** would visit prominent hospitals to showcase the benefits of this software through live demonstration to the doctors.



- They would be given a **free 15 days trial**.
- Once a good amount of hospitals are integrated with this software, the **results** with respect to **improved efficiency and cost saving** in the first 6 months of integration would be used to **attract the other hospitals**.

## Reaching out to new markets and customers

**Patient's pain points** (based on a focus group interview conducted)- wants customized treatment, unsure whether a symptom is big enough to visit a doctor, is anxious to know more about their situation post doctor consultation, trusts medicines from a known and trustworthy company, wants to know about the medicine that would be suitable for them rather than getting to know about every medicine a company offers, ability to identify a disease in early stages company for both the doctors and the patients

### Segmentation and Targeting through Machine Learning (ML) and GenAI

- ML and predictive analysis can be used for **segmentation**. Data regarding demographics of a customer can be used to **predict** the prevalence of a **certain disease in a certain region** of our **target locations**.
- This should be coupled with **video ads via Above-The-Line Marketing** in their region **highlighting** the prevalence of the **disease in their region using numbers** to show the intensity coupled with what can be done to prevent the same and which medicines by Dolocon are useful in curing the disease in case someone falls sick. These **video ads would be specific to a region**. Hence, various regions within a **location** can be **targeted through personalized videos** curated especially for that region. This will **improve the brand recall**, a concept not very popular in pharma industry.

### Personalized Advertising and website through Big Data and ML

Personalised advertising using data regarding which **customers** are actively **looking for healthcare** related info and regarding which disease are their searches based on. The same can be done using **SEO** by **shifting their website** which **features** the product to the **top of the search result page**. Through this, Dolocon will get to know which customers are looking for which medicine. Personalized ads through digital marketing along with **personalized website**, then, should be displayed to these customers not only about the medicine but also how the company's brand is a reputed one in the countries it has been operating in for decades in order to build trust. This will lead to advertising medicines to those who actually need it and hence, optimization in the campaigns.

### AI based ChatBot and Symptom Checker

AI based ChatBot and Symptom Checker through Natural language Processing (NLP) Chatbot called '**Dr.Bot**' can be **developed using NLP**, which helps in making human-like language. Be it for discussing symptoms or resolving queries post doctor consultation, this ChatBot will be **available 24/7** and hence, would make the customer feel less anxious about their symptoms and conditions. Additionally, this app can be used by the public in general so that they can tell the chatbot about their activities, family history etc helping to **detect a possible disease in the early stage itself**. The bot would provide a quick response in the language preference set by the user.

### Test, track and optimize better using big data and A/B testing

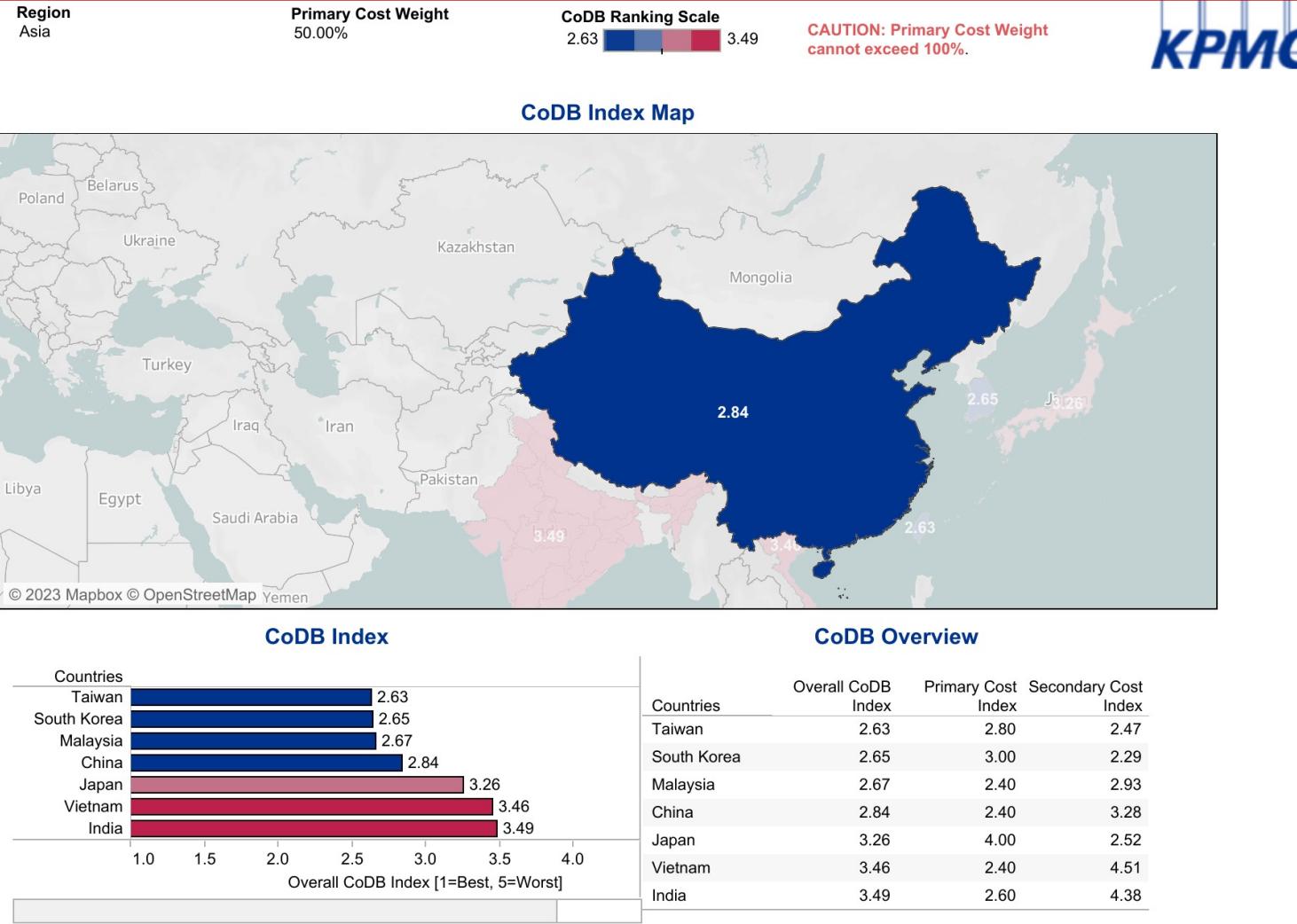
All the above-mentioned marketing campaigns should be **tested using data sets** collected from these campaigns about the **customer retention and conversion**. The result from this **analysis** will help determine the **gaps** and the same can be **filled by optimizing the campaigns** better for improved results. This is a great feedback mechanism as analysis of big data provides **deeper insights into the customer's expectation**.

### Using Data Management Platform (DMP) tool

Using Data Management Platform (DMP) tool to assist in strategies above Dolocon can **collaborate** with companies that **provide Data management platform** in order to **collect first, second, and third-party customer data** from various be it online or offline. This data is required for successful **implementation of segmentation, personalized advertising & feedback** mechanism mentioned above.

## Annexure

# Annexure



Here, Cost of Doing business (CoDB) Index for China is 2.84 while for India it is 3.49. The major reason for low CoDB index of India is Poor infrastructure and Quality of labor cost, which will change in upcoming years.



Hourly Comp. Weight 20.00%

Real Estate Weight 20.00%

Utility Weight 20.00%

Corporate Tax Weight 20.00%

Interest Rate Weight 20.00%

Labor Quality Weight 25.00%

Ease of Business Weight 25.00%

Infrastructure Weight 25.00%

Risk and Protections Weight 25.00%

Breakdown of Primary cost Index

Breakdown of Secondary cost Index

**Suggestion:** To overcome geopolitical tension between China and US, we are not going to start Manufacturing plant in China.

Starting Manufacturing plant in India will reduce Import cost of API and cross country transportation cost also, Which will reduce our expenditure by approx. 7 - 10%.

# Annexure: Business value chain

Figure 2

## Value Creation Levers:

PLS executives are mobilizing both traditional and next generation levers to free up resources



	R&D	Supply	Commercial	Enabling Functions
Tried & True	- Portfolio prioritization - Site footprint - CRO model optimization - Governance simplification - Spans/layers	- Network design - Sourcing - CMO model optimization - Process excellence - Right first time	- Physician targeting - Sales effectiveness - Media buying - Lifecycle disciplines - Revenue leakage/GTN mgmt	- Demand management - Global shared services - Operating model/org design - IT portfolio management - Process excellence
Next Generation	- Intelligent trial design - AI-enabled case processing - Remote site monitoring - AI-driven discovery	- Connected Supply Chain - Smart Factory (e.g. Yield, Assets, Energy) - Digital Quality	- Micro targeting - Omni channel orchestration - Automation (ComOps, Compliance) - Digital experience	- Intelligent automation at-scale - 'Digital products' (e.g., analytics on demand) - Cloud migration and systems optimization

Source: PwC

1. Monetizing Digital Investments: Embrace advanced analytics, AI, and automation for transformational impact (Figure 2).
2. Tangible Use Cases: Neuroscience firm reduced Phase III study costs by 40%, cut timelines by 25% through intelligent trial design.
3. Future-Proofing Capabilities: Invest in AI-driven research, smart factories, omni-commercial orchestration, supply chain control towers, on-demand finance insights, and next-gen automation.
4. Unlocking Savings: Potential millions in savings across Phase III portfolio; improved patient benefits.
5. Technology-Driven Future: Drive efficiencies and innovation across the value chain.

## Annexure: Key Trend

**The table evaluates the potential impact of selected trends across four therapeutic areas: oncology, neurology, diabetes and cardiovascular.**

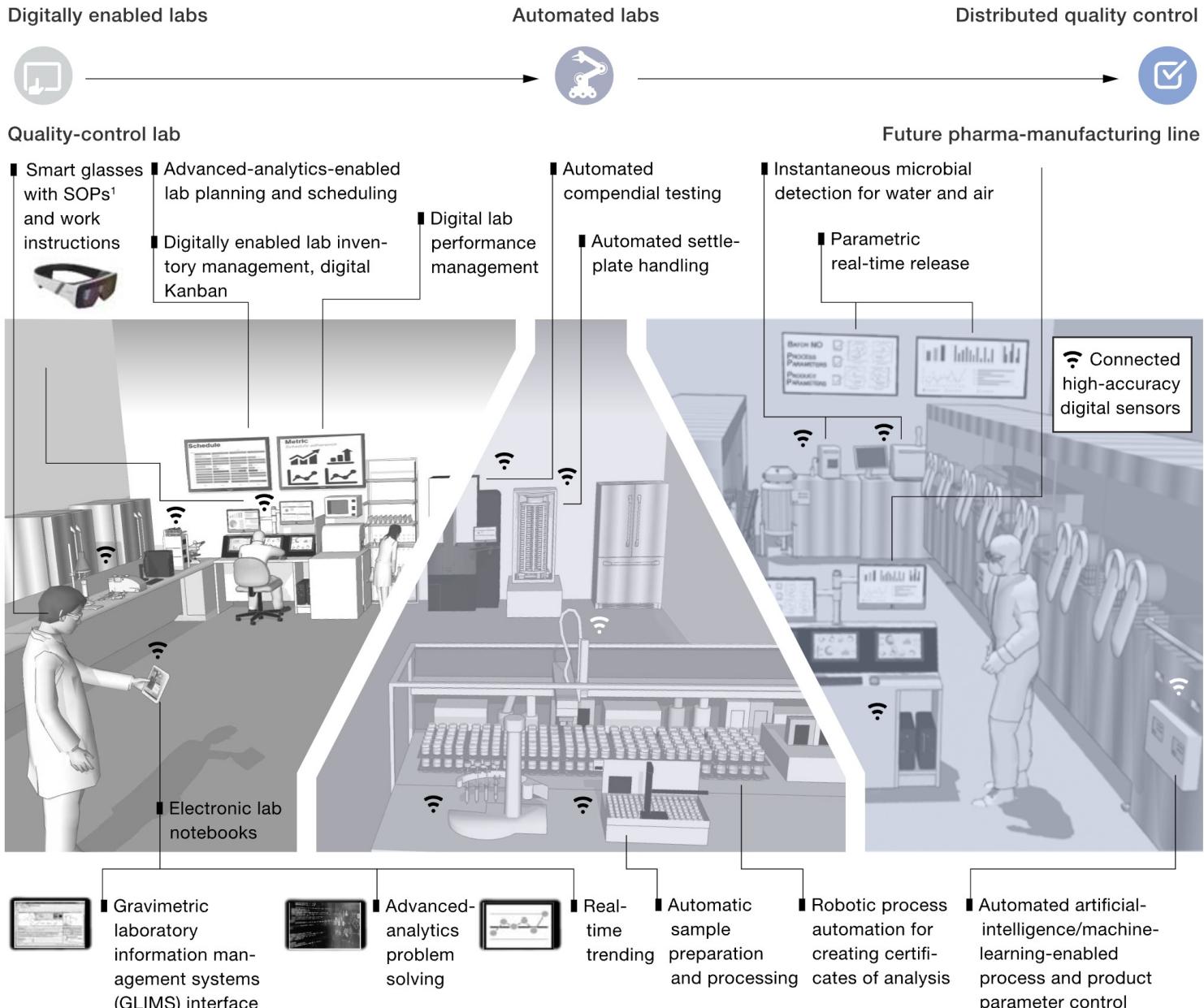
# Annexure: Three horizons of lab evolution

As pharmaceutical labs incorporate new technologies, they will evolve to become more digitized, automated, and distributed in nature.

## Pharmaceutical lab evolution

	 Digitally enabled labs	 Automated labs	 Distributed quality control
<b>Location of quality-control test execution</b>	<ul style="list-style-type: none"><li>• 90%+ of testing in labs</li><li>• Some limited testing done online</li></ul>	<ul style="list-style-type: none"><li>• 60–80% of testing in labs</li><li>• 20–40% of testing on shop floor</li></ul>	<ul style="list-style-type: none"><li>• 0–20% of testing in labs (eg, specialty)</li><li>• 80–100% online real-time testing, review by exception</li></ul>
<b>Use of data and advanced technologies</b>	<ul style="list-style-type: none"><li>• Automated data transcription between equipment and systems</li><li>• Advanced data analytics for real-time data insights and optimized schedules</li><li>• 80% paperless lab</li></ul>	<ul style="list-style-type: none"><li>• Full automation of testing and nontesting lab processes</li></ul>	<ul style="list-style-type: none"><li>• Automated transcription of testing and product-quality-relevant process data</li><li>• Artificial-intelligence-enabled equipment and robots</li><li>• Parametric release</li><li>• 100% paperless</li></ul>
<b>New capabilities</b>	<ul style="list-style-type: none"><li>• Data engineers and data scientists</li><li>• Advanced IT systems to support data capturing and analytics</li></ul>	<ul style="list-style-type: none"><li>• Lab supertechnicians with knowledge of advanced technologies</li><li>• Advanced automation/robotics engineers</li></ul>	<ul style="list-style-type: none"><li>• Engineers to maintain and enhance automated systems</li><li>• Lab skills on shop floor</li></ul>
<b>Availability today</b>	<ul style="list-style-type: none"><li>• 100% available</li></ul>	<ul style="list-style-type: none"><li>• 70–80% available (not all investments may be cost-effective yet)</li></ul>	<ul style="list-style-type: none"><li>• 50–60% available (may differ by type—eg, more options for biologic sites)</li></ul>

# Annexure: Distributed quality control



<sup>1</sup>Standard operating procedures.