

IoT in healthcare

address by

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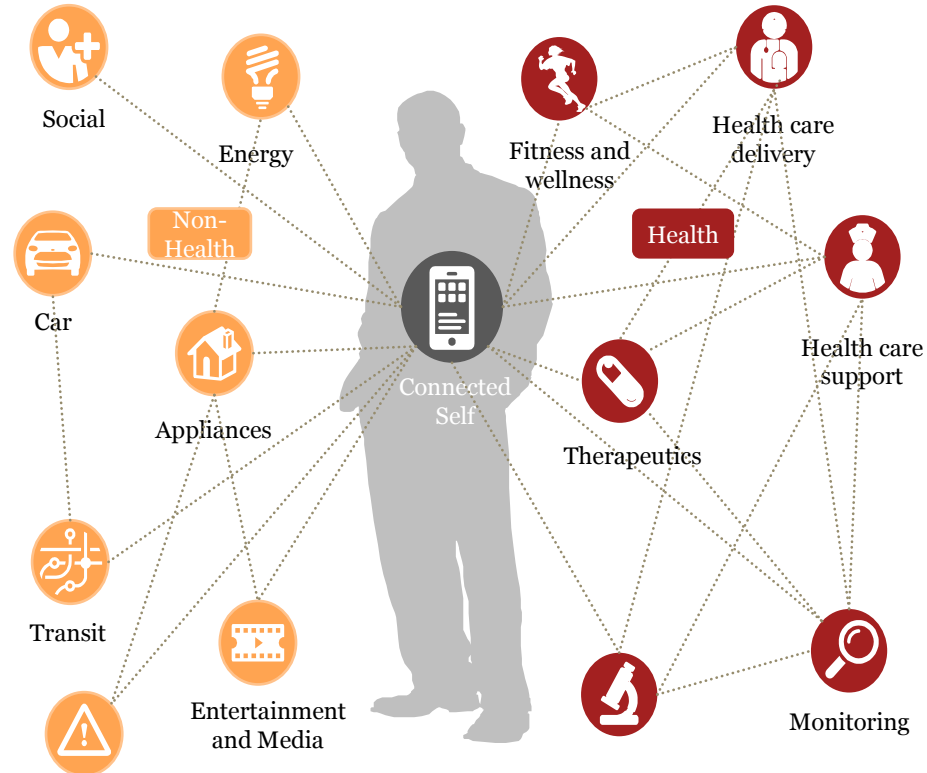
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Internet of Things (IoT) – an overview

Internet of Things is

- internetworking of physical devices (“things”)
- that harvest information from the environment (through **sensing**)
- and **interact** with the physical world (through actuation, command and control)
- to provide services for information transfer, analytics, applications, and communications



The future connected world

IoT can address several challenges faced by the Indian healthcare ecosystem

Challenges faced in Indian healthcare ecosystem:



Lack of healthcare access



Increasing incidence of chronic diseases



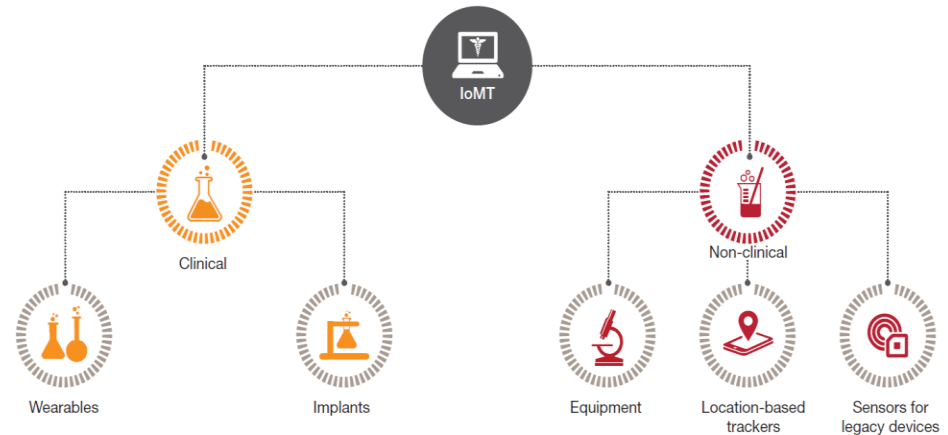
Lack of infrastructure



Reactive approach

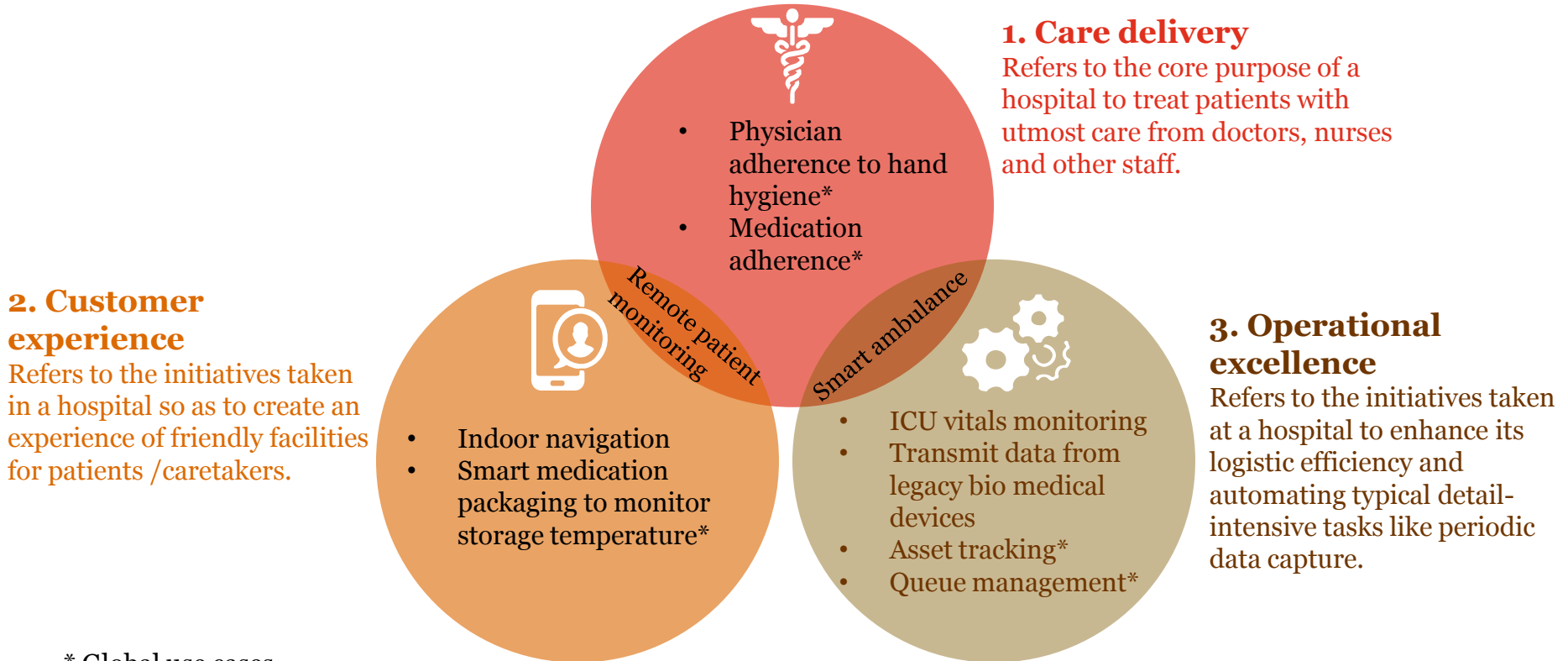
IoT can be leveraged to cater to these specific challenges :

- Provide information **remotely**
- Capture **real-time** patient information and assist with application of AI for early detection of serious illnesses
- Enable **critical home care**
- Enable the patient and healthcare providers to take **proactive measures**



Applications of IoT in healthcare

PwC Healthcare IT Survey 2018 highlighted increasing adoption of IoT by healthcare providers across 3 broad areas



* Global use cases

IoT use case #1: vital stats monitoring in ICU

Problem statement:

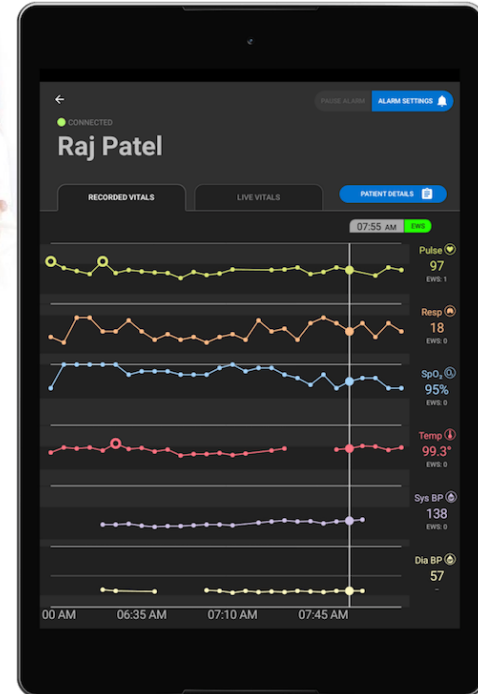
In an ICU where nurses **manually record** patient vitals at regular intervals, there is a **risk of missing out on spikes in vitals**. Doctors thus manually operate the monitors to view recent vitals.

Solution:

- Install **IoT sensors** on bedside monitors
- IoT sensors record vitals on a **continuous** basis
- **Intuitive dashboards** are prepared for doctors
- Doctors review the dashboards instead of relying on data entered manually by nurses

Implementation:

A leading multispecialty hospital in North India has been running a pilot program for the last two years on 10 ICU beds.



IoT use case #2: Home care

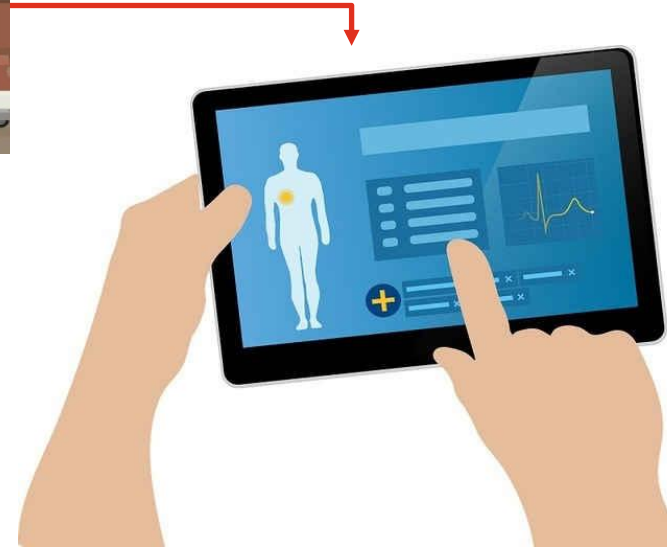
Problem statement:

Healthcare infrastructure in India is not enough to meet critical care demand. Moreover, for some illnesses and prolonged post operative care, it is preferable for patients to stay at home and receive the care and nurturing that only home environment can provide.

Solution:

Critical care at home:

- IoT based continuous monitoring
- ICU standard cleanliness and facilities
- Convenience of home
- Remote reviews by doctors and instruction to attending nurses



Implementation:

Multiple start-ups in India offer this service.

IoT use case #3 : Medication adherence

Problem statement:

Medication adherence is a primary determinant of treatment success. **Non adherence** can lead to **worsening of disease, higher health care costs** and in critical cases, **death**.

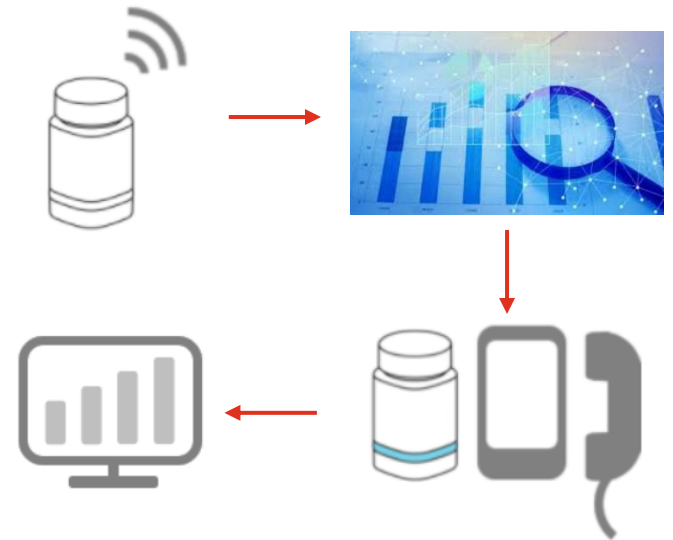
Solution:

Smart wireless pill bottles:

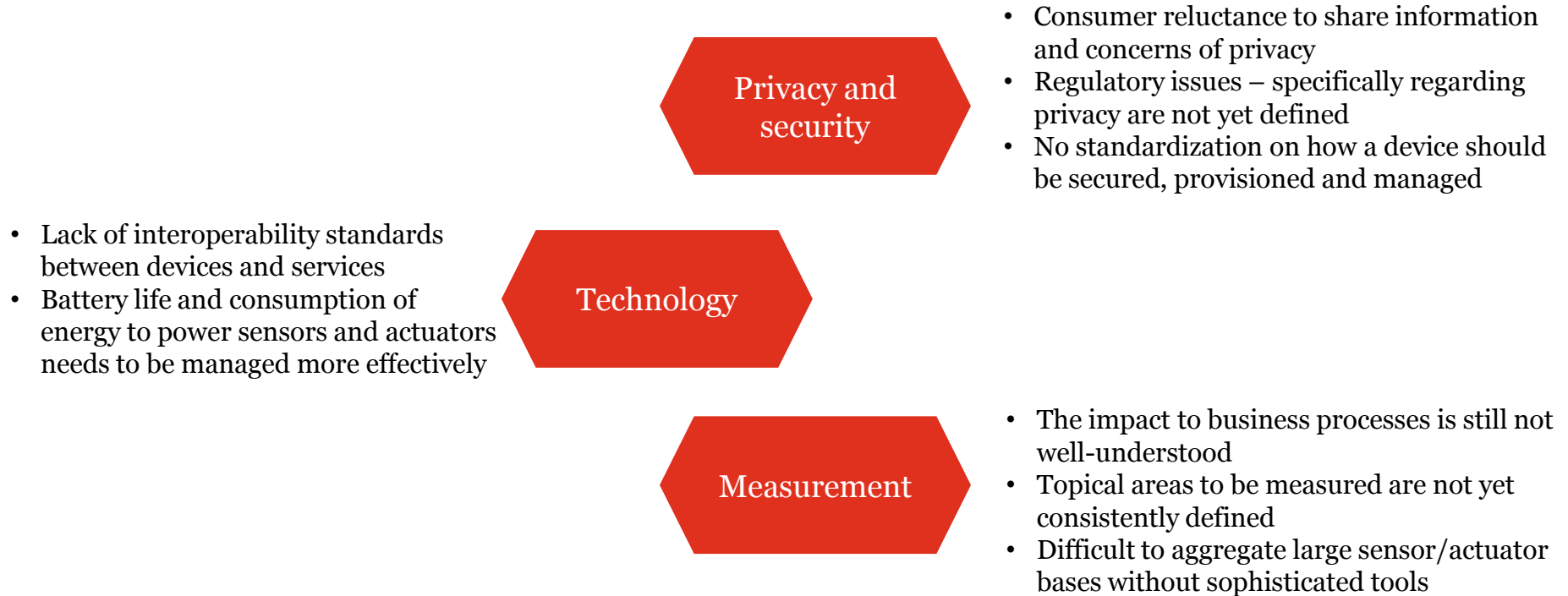
- **Sensors** are used to passively send real-time data to care providers
- Data is analyzed to **identify anomalies**
- **On-bottle lights, SMS, phone calls** and **visits** are arranged to ensure adherence and avoid human error
- **Analysis** of medication adherence is available for patients, doctors and family members

Implementation:

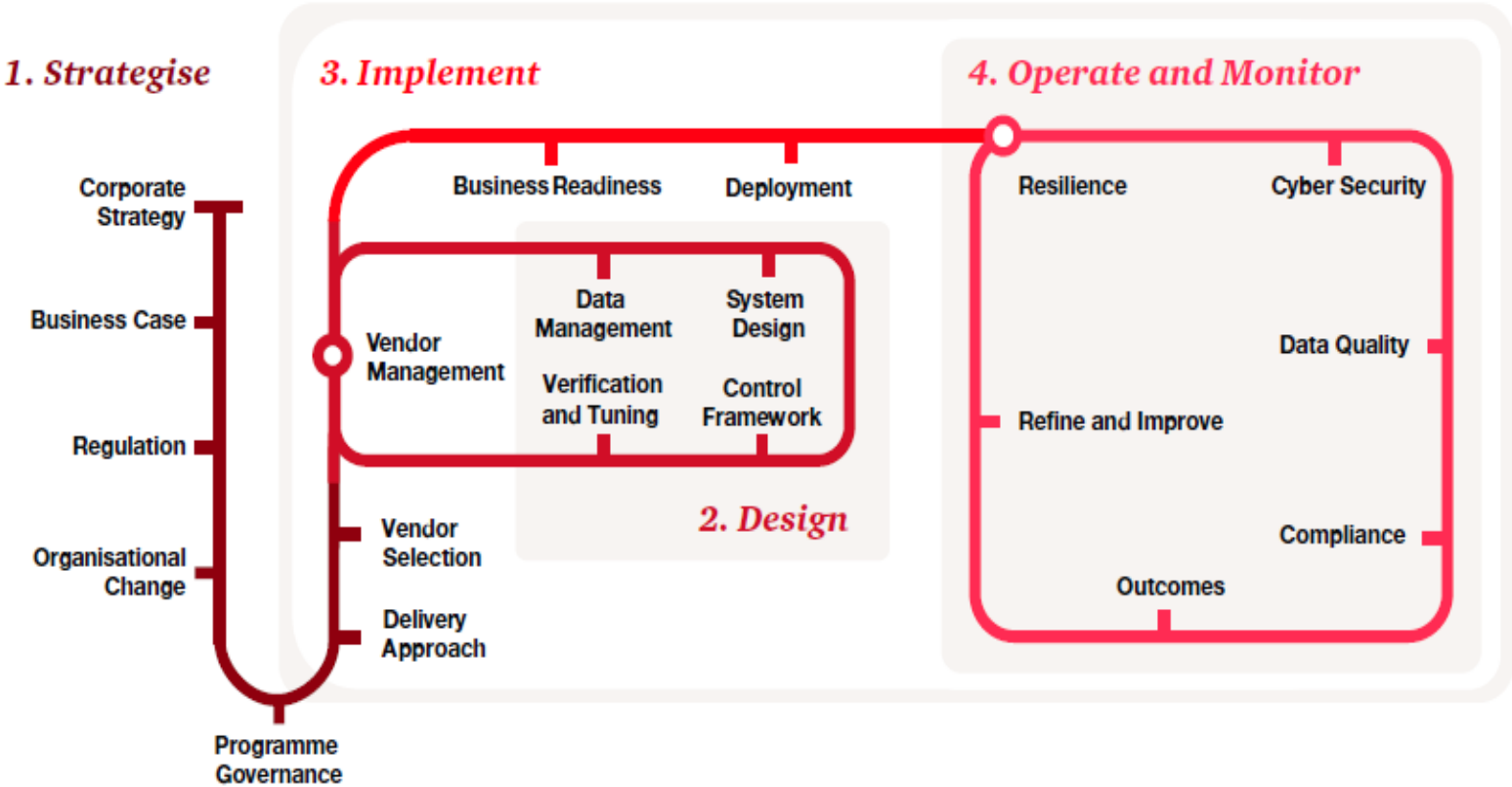
A start-up in USA has developed this smart wireless pill bottle. Their programs have shown an increase in adherence for speciality medications.



For IoT to scale beyond early adopters– it must overcome specific challenges within 3 main categories: privacy/security, technology and measurement



PwC recommends a systematic approach for implementing IoT technologies



Thank You

Illustrative list of healthcare IoT solution providers and platform providers

IoT solution providers

S. No.	Provider	S. No.	Provider
1	Augmedix	5	Lively
2	Azoi	6	Philips
3	Cooley	7	SpanIdea
4	Cygnnet Infotech	8	[x]cube LABS

IoT platform providers

S. No.	Provider	Platform
1	GE	Predix
2	Hewlett Packard Enterprise	Universal Internet of Things (IoT)
3	SAP	Leonardo