



# EMR SELECTION AND IMPLEMENTATION CHALLENGES

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# AGENDA

## SELECTION OF EMR

**Who is Mr Right?**

**Technology platform**

**Master data**

**Process As-Is and To-Be  
Mapping**

**Integration with other  
Applications**

**IT Infrastructure**

## EMR IMPLEMENTATION CHALLENGES

**Project plan**

**Team skills**

**User expectations -  
Change Management**

**Governance Model**

**Privacy and Security**



# SELECTION OF EMR

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# WHO IS MR RIGHT?

Choosing the right technology platform for a healthcare organization is a truly complex decision.

One size fits all doesn't work

There is no perfect EMR yet

In a green-field hospital - Consider adopting to the EMR process than vice-versa

In a brown-field hospital - EMR should be configurable as per hospital process, but not everything is configurable in the EMR

Be ready to forego process/activity that the EMR doesn't provide, as customization [code changes] is expensive to maintain

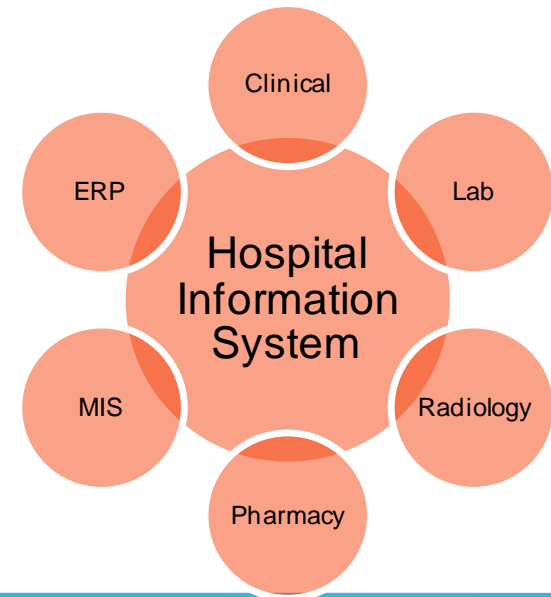
Culture eats strategy for breakfast – Select a product that is sensitive to the local culture

Consider the local regulatory framework for EMR selection – Don't assume!

EMR selection should be done by experts not by Executives sitting in a room!

## A TRULY Digital hospital requires total clinical transformation

Build a 'flexible', 'dynamic', long-term IT roadmap that is totally aligned to business needs



# TECHNOLOGY PLATFORM – OPEN SOURCE?

Myth - Open source is low cost.

Open source doesn't have upfront license cost but has high maintenance cost unless it is spread across multiple implementations.

For open source support - There is a mirror at your back!

Select an open source if there is a large company at the back e.g. SUN for Java

TCO of Proprietary and Open source is comparable – license, implementation, support, adoption, upgrades

The EMR may be open source but the recommended underlying technology maybe proprietary!

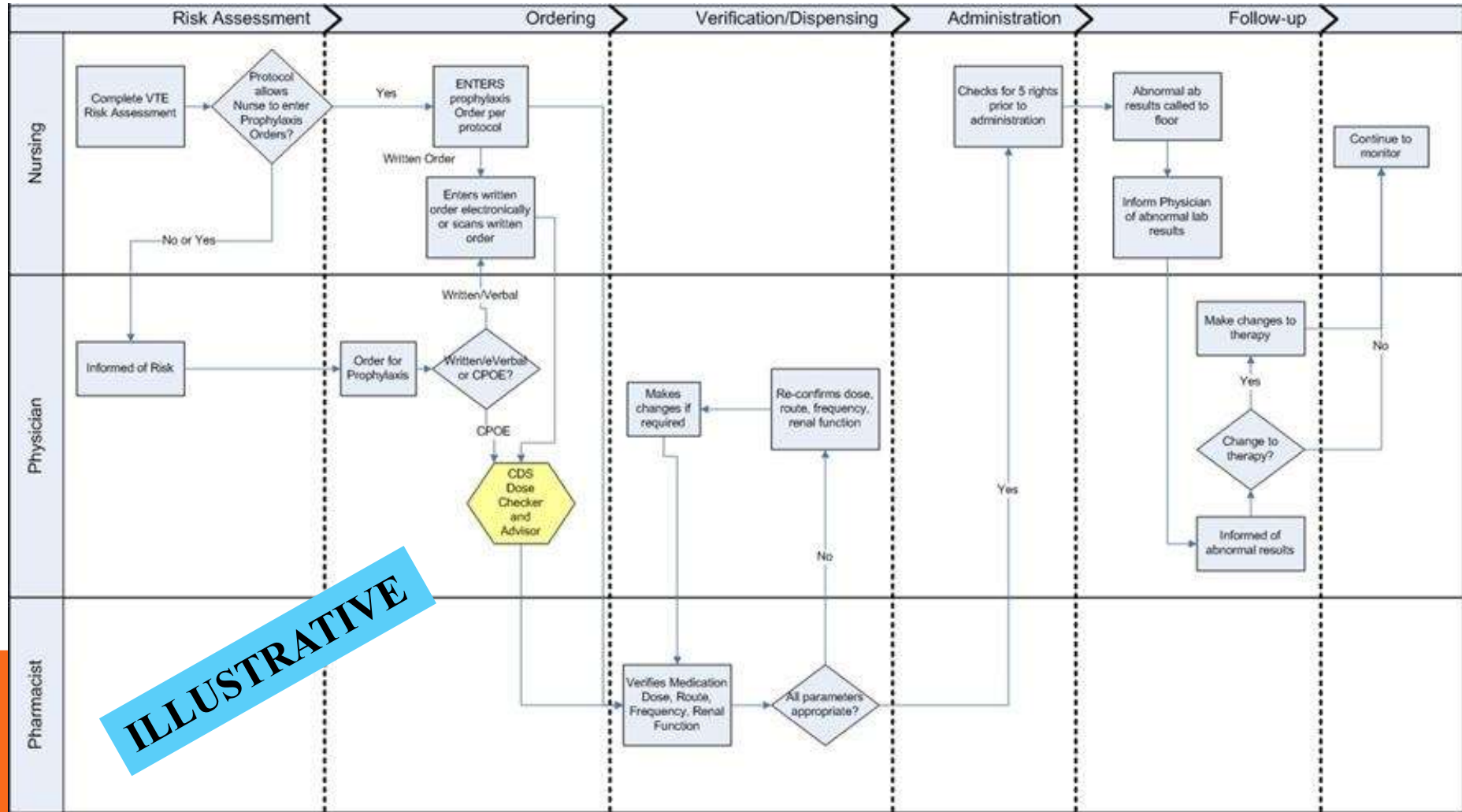


# MASTER DATA MANAGEMENT

Masters	Examples	Guiding Standards
Billing Master	Packages, Rates	Map Rates to Masters
Items Master	Consumable, Prosthetics, Stents, Nebulizers	HCPCS Level - II
Drug Master	Drug File	HCPCS Level - II
Clinical Master	Evaluation, Specialty wise Procedures, Medicine, Surgeries, Anesthesia	CPT
Lab Master	Microbiology, BioChem, Pathology, Histology	CPT, CAP [optional]
Radiology Master	Diagnostic, Interventional, Therapeutic	CPT
Department Master	Who, When, Where – R&R	Hospital Own Standard
People Master	Org Structure, Roles/Names with In/out process	Hospital Own Standard

- **Clean Master data is a pre-requisite for EMR. Else the implementation team will struggle for data integrity between HIS, EMR and Manual systems.**
- **Necessary to build consensus amongst users to clean up the master data.**

# FLEXIBLE AND CONFIGURABLE TO ADAPT TO HOSPITAL AS-IS PROCESSES



# INTEGRATION WITH OTHER APPLICATIONS

Think about:

Define the standards for the integration

Reengineer Home-grown systems not built for integration

Point-to-point Integration or [Multi-point] ESB?

Simple Integration engine or BPM engine?

KPI – Dashboards?

Data warehousing and Reporting?





# IT INFRASTRUCTURE

Prepare the IT infrastructure for  
Transaction load of EMR

CPOE increases the transaction load  
multiple times

Wi-fi in wards for doctors to take notes  
and give orders thru tablets?

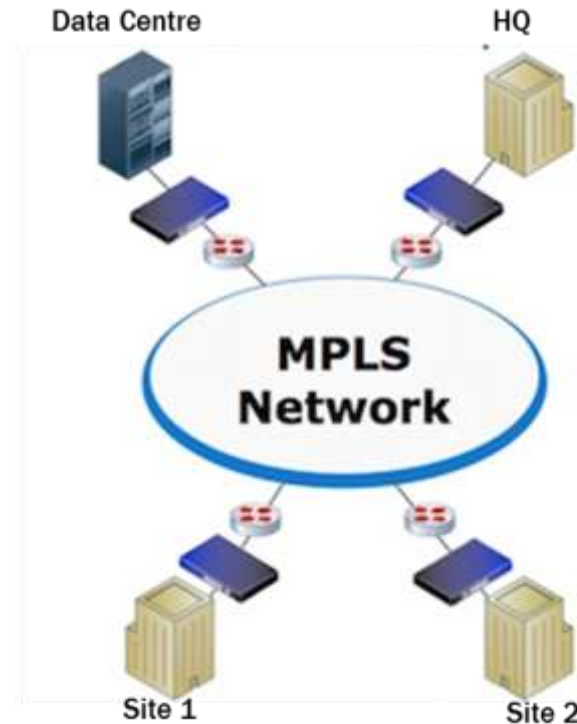
Single site design difficult to change to  
multi-site later

In-house or remote data center?

If In-house – hardened data center?

Redundancy in Network – ISP? MPLS?

What about BCP and DR?





# PRIVACY AND SECURITY ISSUES

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# HIPAA TITLE II

Title II: Preventing Health Care Fraud and Abuse; Administrative Simplification; Medical Liability Reform

- Data Privacy
- Transactions and Code Sets
- Data Security
- Unique Identifiers

EMR application and the entire IT system should be compliant to privacy and security standards

Entire IT System needs to be certified as per ISO 27001/BS7799, just as all banking systems



# DATA PRIVACY

## Protected Health Information (PHI)

- Right to keep personal information from outside world
- Hospital staff, in-house and outsourced IT staff may be authorized to see data and may disclose it inappropriately

Protect sensitive information – PNDT and MTP Act

Positive results for sensitive Lab tests - HIV etc.

Public health research - Anonymised data

Don't want data of one landing up on another's desk - People master, Dept master to be in sync in integrated systems

Dr Parminder Singh = Dr P Singh !

Dr Paramjit Singh = Dr P Singh ?



# TRANSACTIONS AND CODE SETS

Master Data integration challenge – codify diagnosis, procedures and order sets

Data Analytics challenge - standard terminology for clinical notes

- Diabetes with MI discharged with B-blocker
- Diabetes with Coronary Atherosclerosis discharged with B-blocker
- Type-II Diabetes with CHF discharged with Metoprolol



# SECURITY

## Network security

- Firewalls,
- Data centre,
- IT Support Teams,
- Outsourcing

## Data Security - Encryption

- Public/Private keys
- Field level security

## Physical security

- Authentication
- Authority
- Audit





# PHYSICAL SECURITY

Authentication - are you who you say you are?

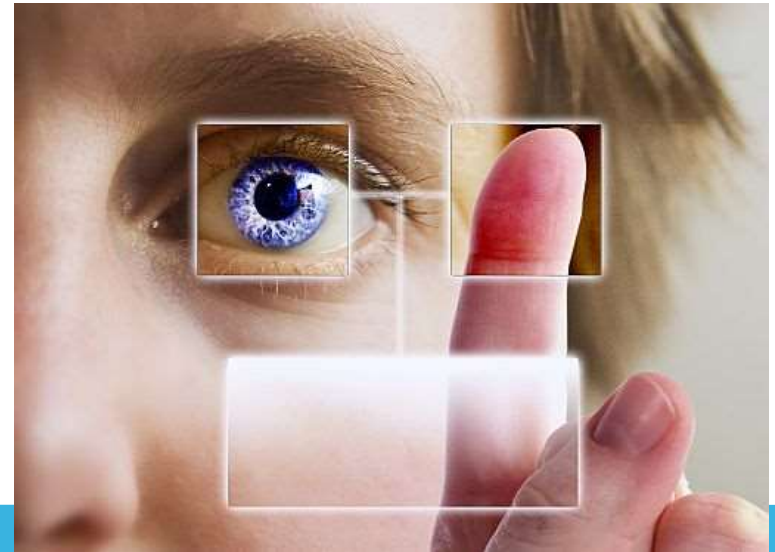
- Passwords, Biometrics (finger print, retinal scan), smartcards

Authority - do you have a need to know?

- User U in role R who satisfies constraint C has permission P
- Ms Ann working as Nurse in ED has r/w/x permissions; whereas she doesn't have those permissions off-duty
- Ensure only authenticated users to perform authorized activities on authorized data

Audit - record of who actually got into what

- Record of every entry, correction, change, override etc



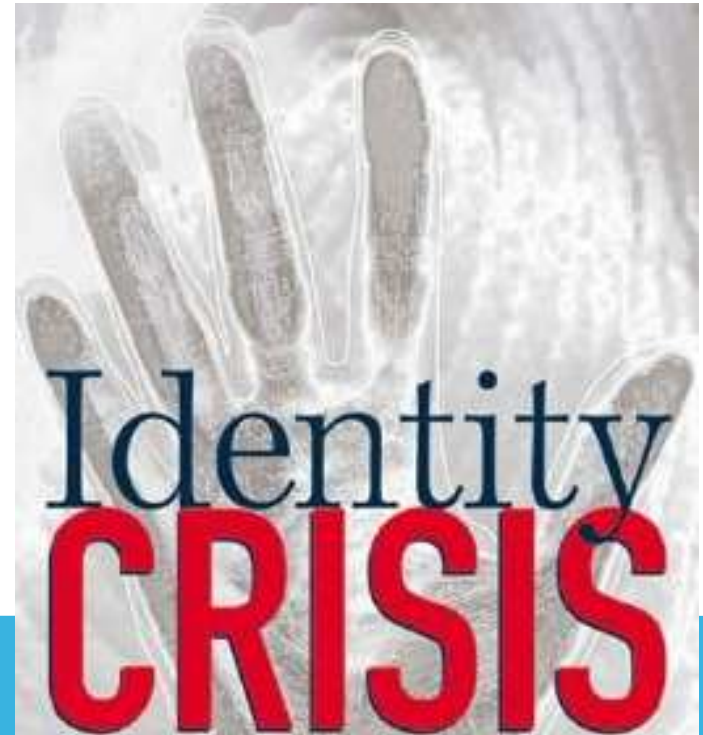
# UNIQUE IDENTIFIERS

## Identity Management in EMR

- People master to be in sync
- Department master to be in sync
- Dr Om Prakash Singh in ENT vs Dr OP Singh in Otolaryngology?

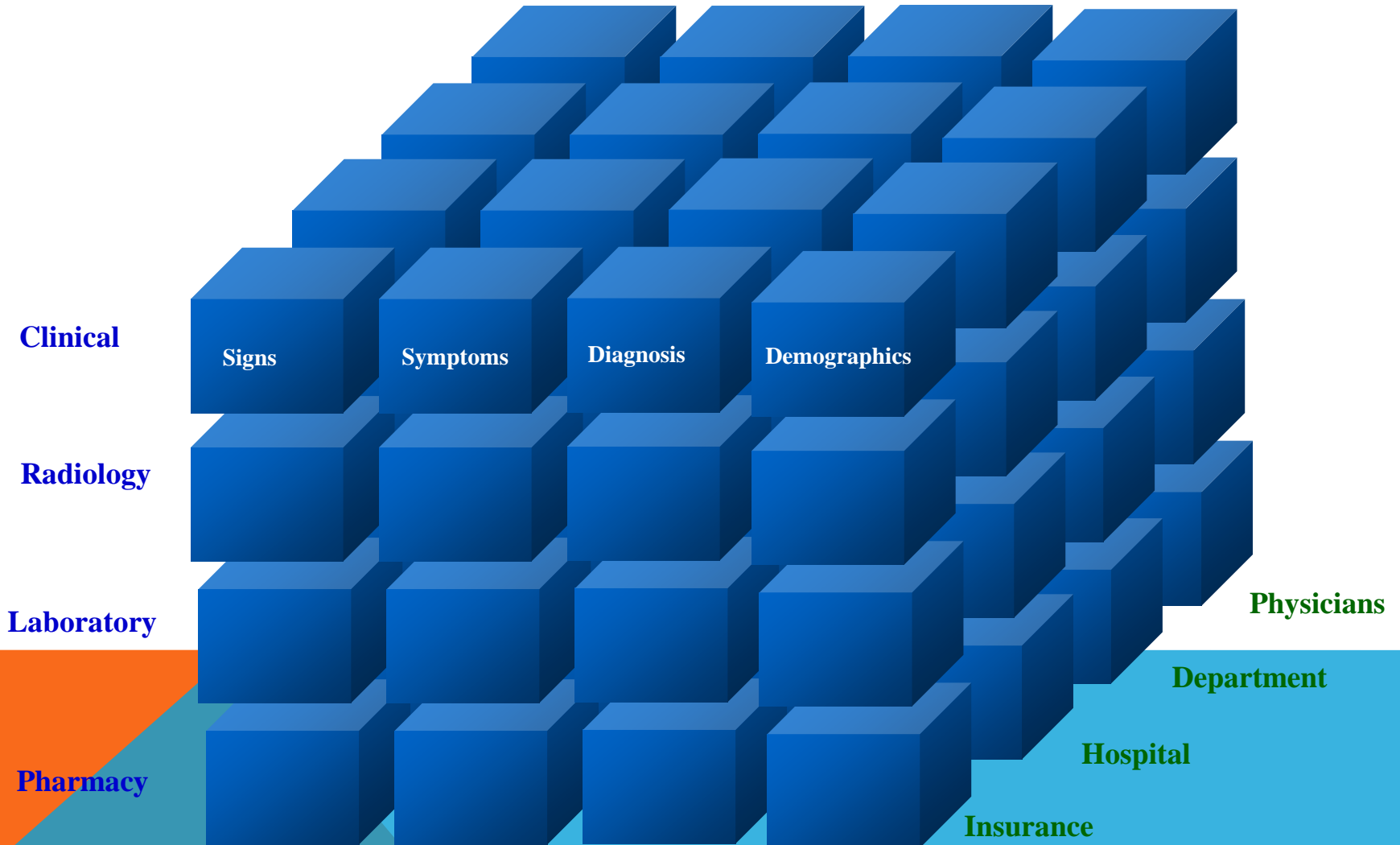
## Enterprise Master Person Index [EMPI] for Identity Management

- Physician Registry
- Patient Registry
- Disease Registry
- Document Registry





# DE-IDENTIFY BEFORE DATA ANALYTICS



# SUMMARY OF PRIVACY & SECURITY

EMR application should be compliant to privacy and security standards

Computing/network infrastructure can deal with security

But privacy is a policy matter

Anonymizing of databases helps but it isn't fool-proof

In general, *people* are the weakest security and privacy link





# EMR IMPLEMENTATION CHALLENGES

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# PROJECT PLAN

There is no fixed way of implementation

Waterfall model cant work

Cant get all detailed requirements upfront

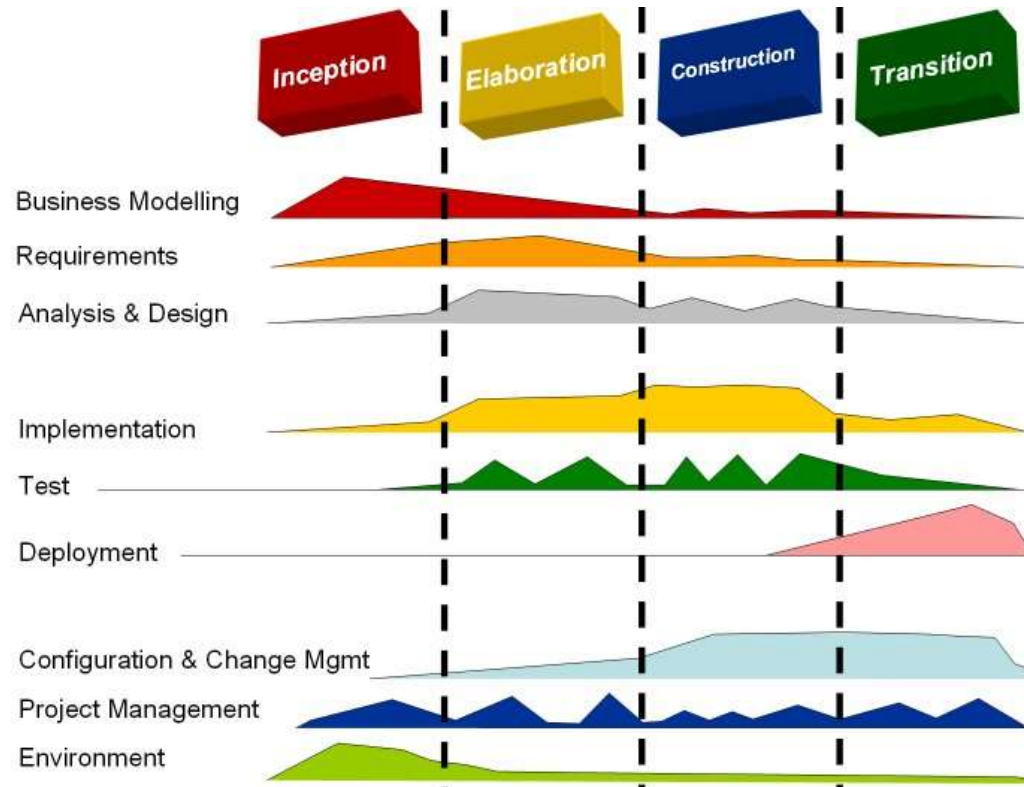
Be open for iterative model e.g. RUP

Cant operate on a beating heart

Governance model to avoid scope creep

Coordinate multiple multi-functional moving parts

Draw a line and then stick to it



# TEAM SKILLS

Healthcare BA for configuration

Tech Architect for installing on server

Network Engineer for IT infrastructure

Healthcare experts talk Greek and Latin jargon which IT folks don't understand.

Healthcare and IT knowledge needs to exist in the same brain and needs to be processed together by the same processor.

PM to coordinate all the gaps

**Doctors are right brain creatures**

Reddish,  
Rounded  
, Raised

123@,  
A+B=#?  
, &



**Must Invest time to make it work**

# HEALTHCARE CHANGE MANAGEMENT

## CAUSE METHODOLOGY

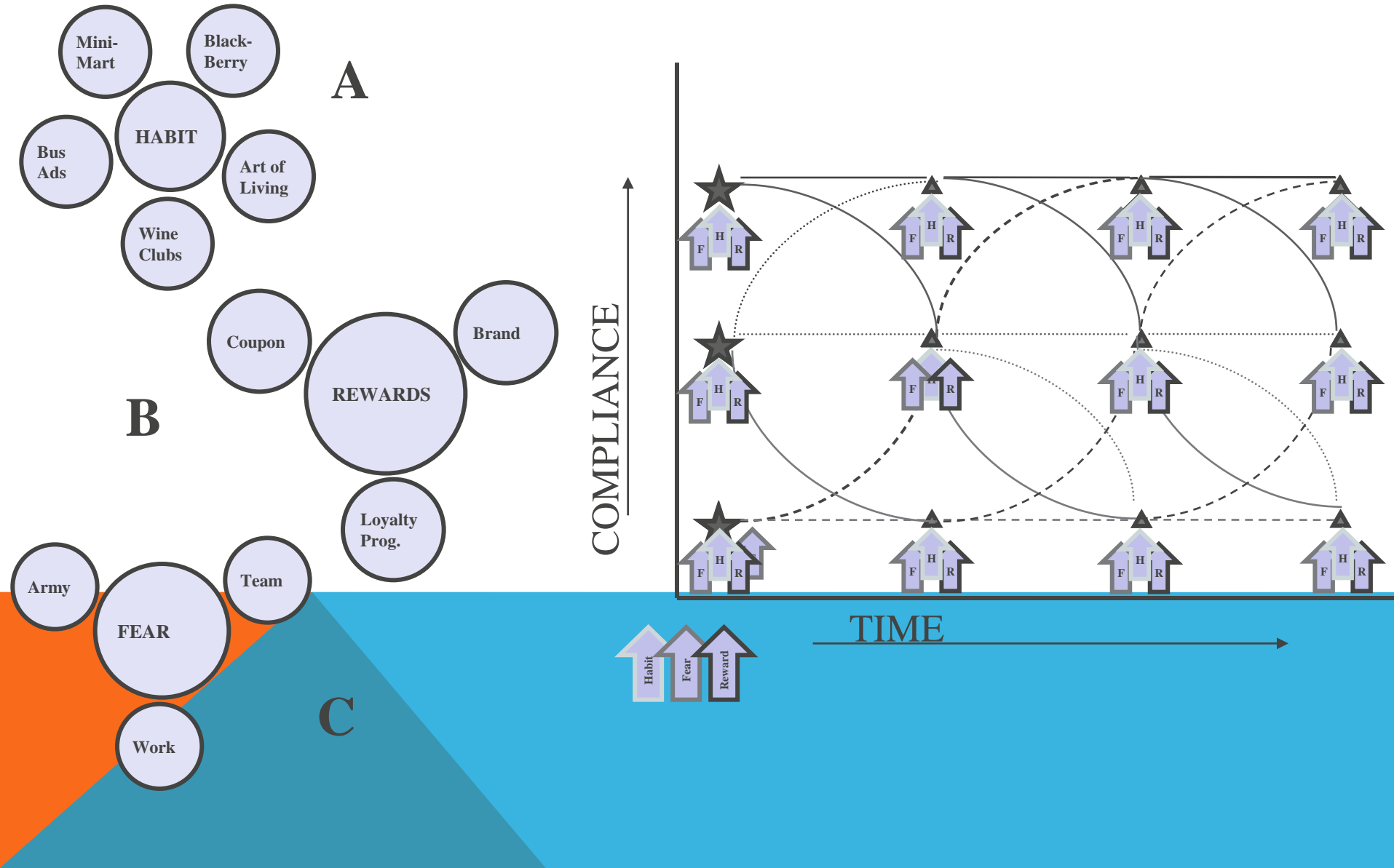
Use a well recognised change management methodology such as CAUSE methodology for managing change in people, process and technology.

- **C**onsciousness of need to change
- **A**spiration to support change
- **U**nderstanding how to change
- **S**trength to over come hurdles and implement change
- **E**cosystem to support, sustain and adopt change

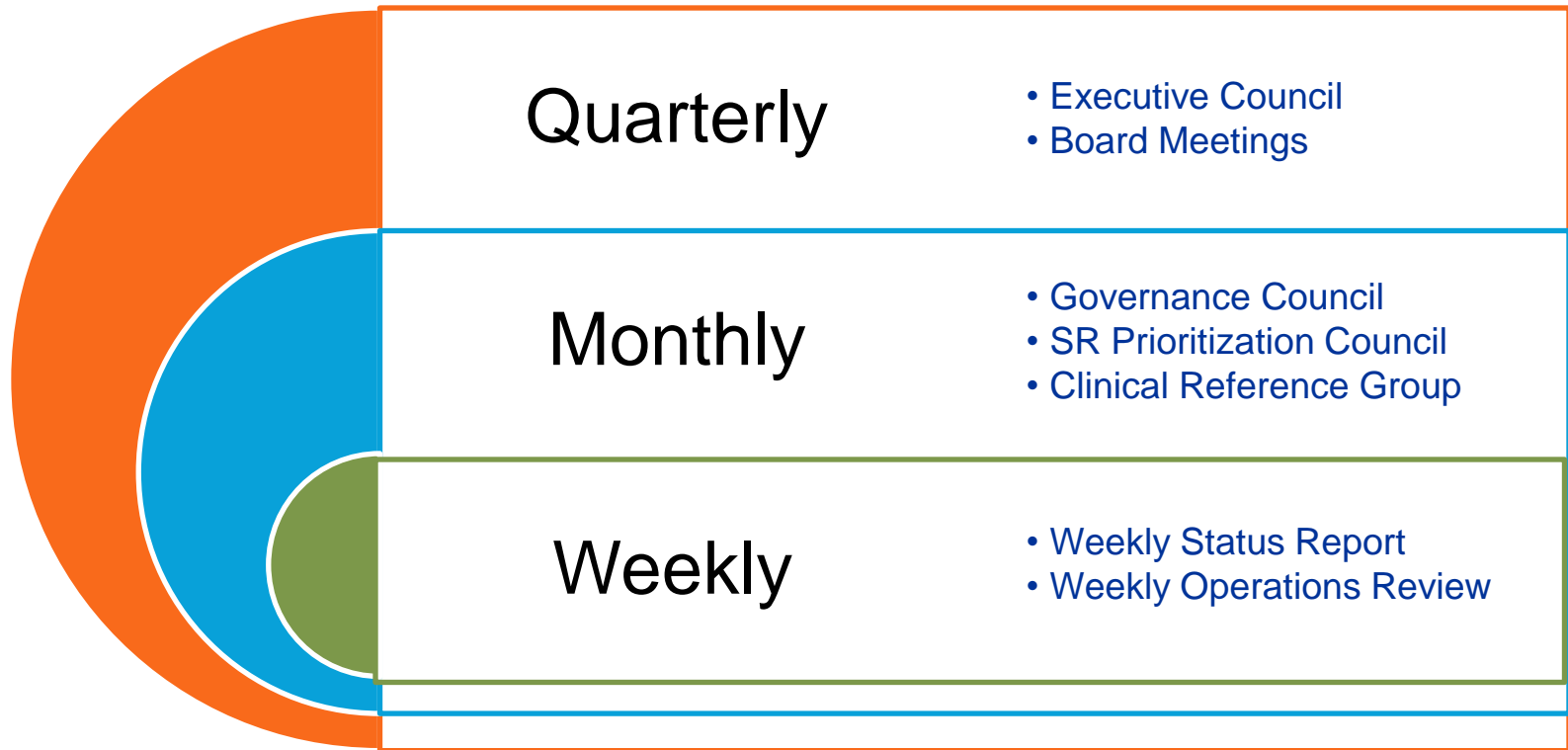
SMOOTH TRANSITION  
FROM CURRENT TO  
OPTIMAL STATE



# BEHAVIOR CHANGE OCCURS IN SMALL STEPS AND REQUIRES CONSTANT REINFORCEMENT



# GOVERNANCE MODEL





## QUOTE FROM MOTHER OF NURSING

“The effect on sickness of beautiful objects, on variety of objects and especially brilliancy of colours, is hardly to be appreciated. Such cravings are usually called the “fancies” of patients but these “fancies” are the most valuable indication of that which is necessary for their recovery. People say that the effect is only on the mind. It is no such thing. The effect is on the body too. Little as we know about the way in which we are affected by form and colour and light, we do know this: that they have an actual and physical effect. Variety of form and brilliance of colour in the objects presented to patients are an actual means of recovery”

- Florence Nightingale

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