

# Transitioning from a Decade Old Legacy System: Experience at Provincial General Hospital Kurunegala

---

DR PRASAD RANATUNGA MBBS MSC (BIOMEDICAL INFORMATICS)  
PROVINCIAL GENERAL HOSPITAL  
KURUNEGALA

2015-10-13



# Legacy System

---

- Are stand-alone applications built during a prior era's technology, but they are perhaps more widely understood as software systems whose plans and documentation are either poor or non-existent
  - Connall & Burns (1993)
- Legacy software systems are large software systems that we don't know how to cope with but that are vital to our organization.
  - Bennett (1995)
- It is a business critical and successful system which has an architecture which makes it insufficiently flexible to meet the challenges of anticipated future change requirements
  - O'Callaghan (1999)

# Legacy System

---

Features,

- written in obsolete programming languages
- lack of consistent documentation
- poor management of data
- degraded structure following modifications
- difficult to expand
- runs on old hardware

# Provincial General Hospital Kurunegala

---

## Software

- HMS (Hospital Management System)
- launched by the Ministry of Health in 2003

## Hardware

- about 100 Computers
- Application Server
- network switches – 28



- Inpatients ▶
- OPD Patients ▶
- Clinic Patients ▶
- Pharmacy ▶
- LAB ▶



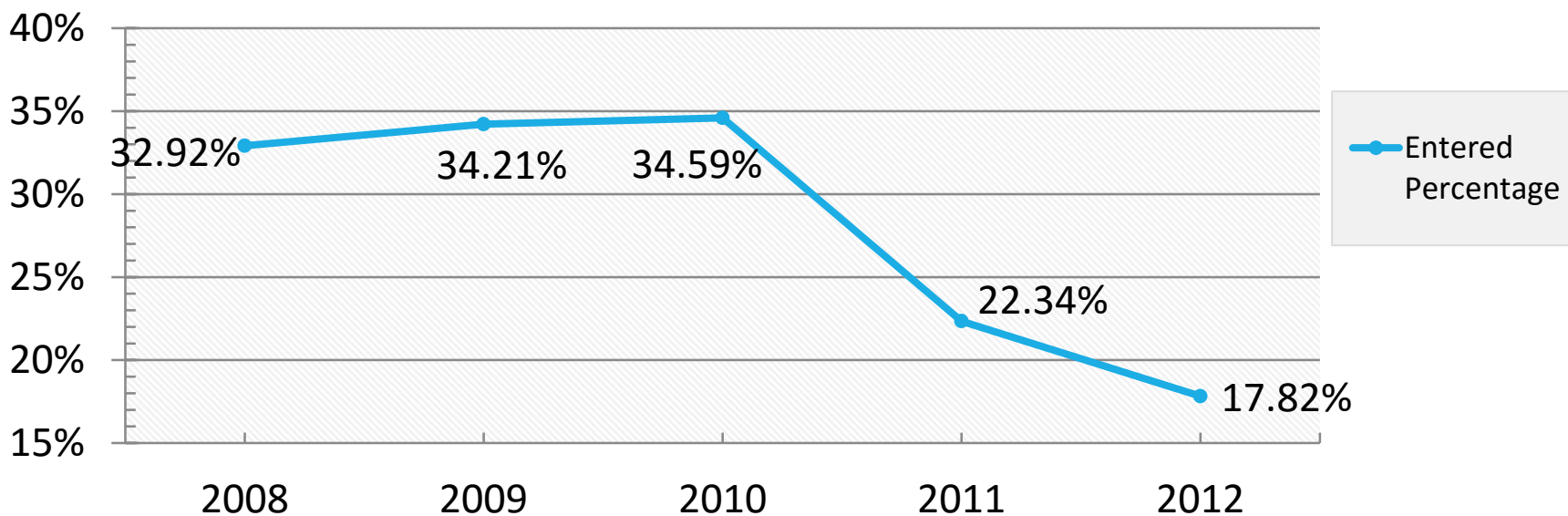
# HMS

---

- Developed by a private company
- Last major update 2007
- No source code or documentation
- Used for,
  - Patient Registration
  - Admission to hospital & ward
  - Discharge

# HMS USAGE

Year	Entered at Admission	Entered at Ward	Percentage
2008	162,187	53,384	32.92%
2009	167,444	57,290	34.21%
2010	170,309	58,918	34.59%
2011	174,568	39,006	22.34%
2012	176,056	31,374	17.82%



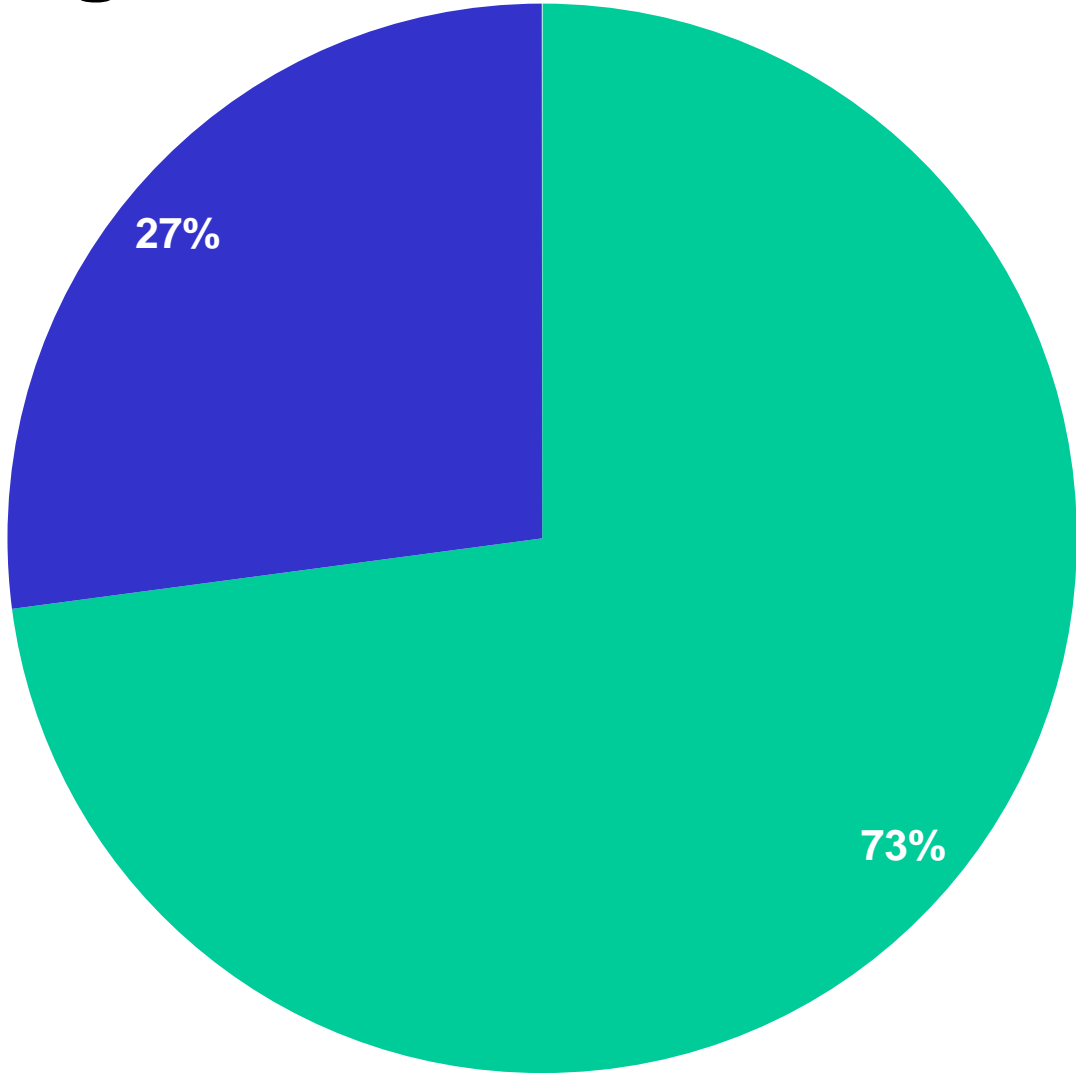
# Why?

---

- Slow response time
- Difficult to navigate menus
- Difficult to find options
- Difficult to backup
- Slow, unresponsive or broken computers
- Too expensive to maintain hardware

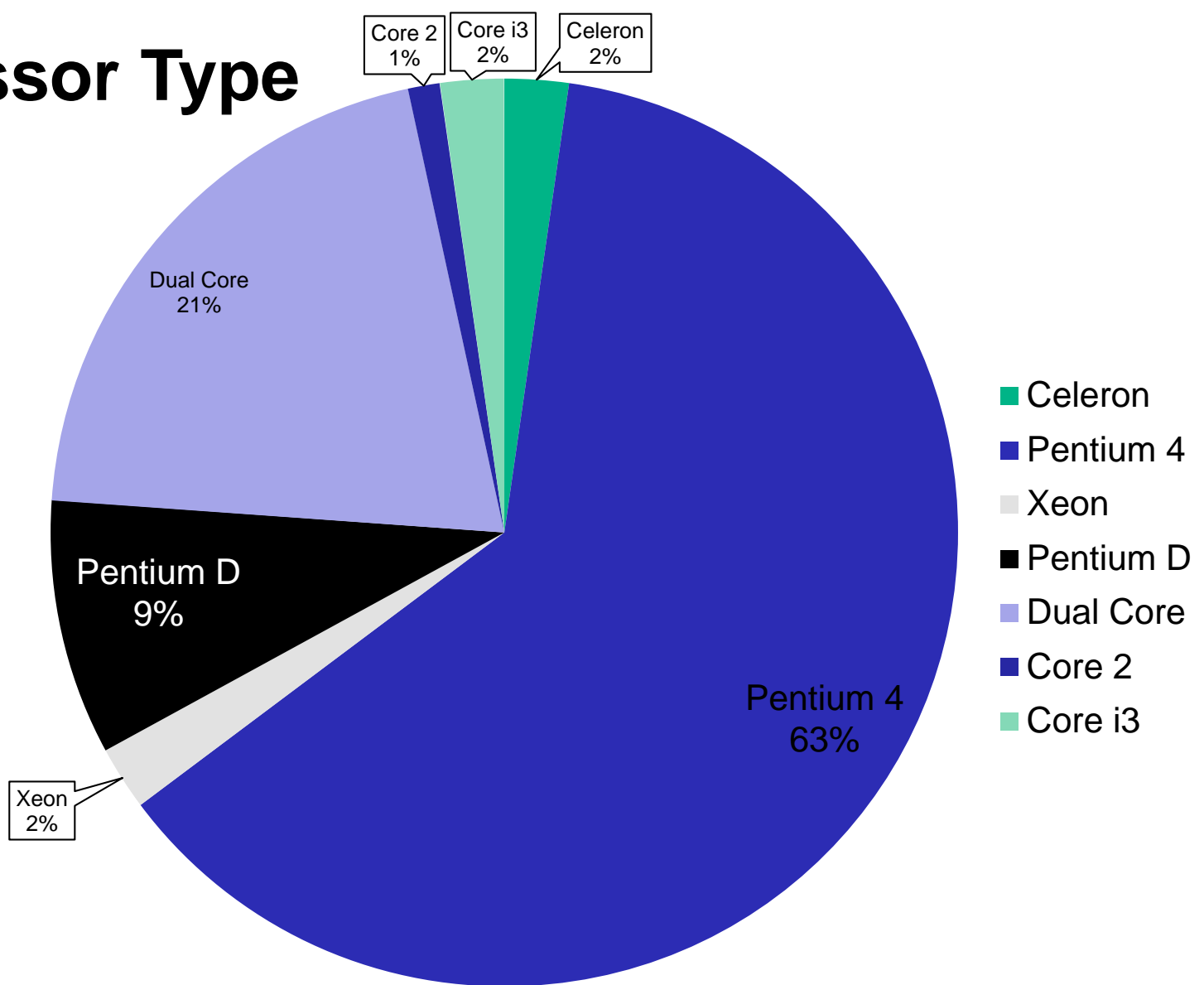


# Working?

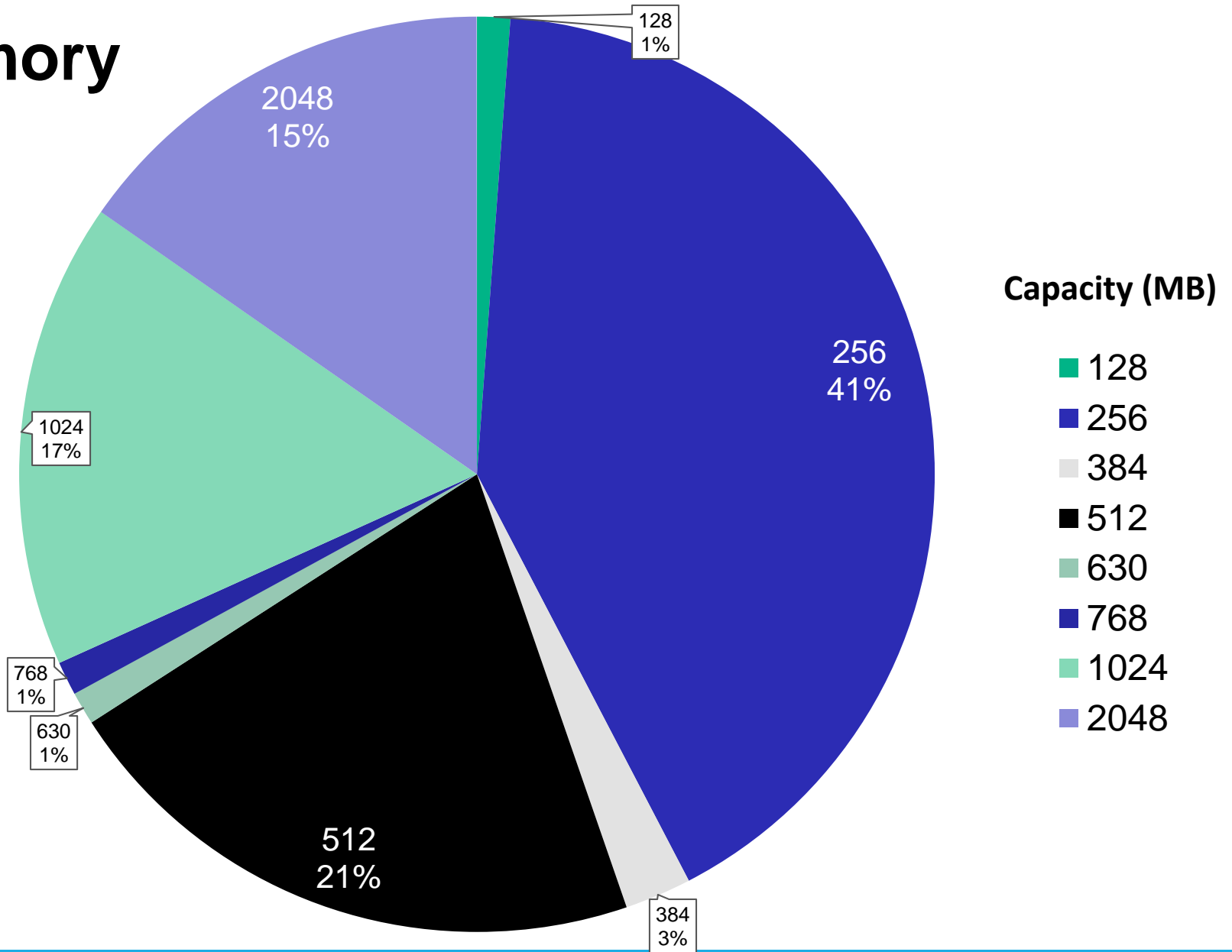


■ Yes	78
■ No	29
	107

# Processor Type



# Memory



# Solution

---

- Abandon
- Carry on maintenance
- Wrap
- Migrate

# Wrap

---

- encapsulating the legacy component
- new interface
  
- Types
  - Database wrappers
  - System service wrappers
  - Application wrappers
  - Function wrappers

# HMS Wrapping

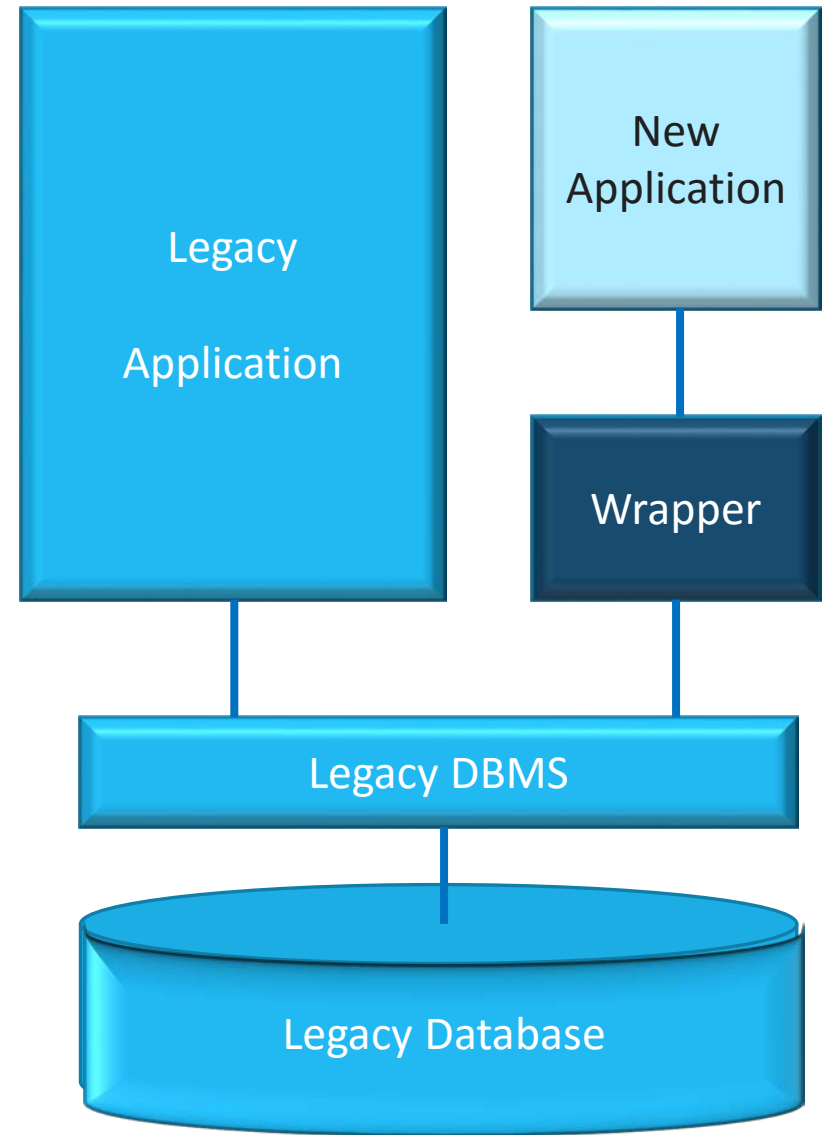


Chart Settings

Criteria: No of Admissions

From: 12/06/13

To: 12/07/13

July 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

today: Jul 12, 2013      none

# Success ?

---

- Users happy
- Development – difficult
- DB problems



1) ADMISSION_MASTER	43) HS_DELIVERYTYPE	86) infoHMS	127) PATIENT_COMPLAINTS	168) TBL_PATIENTSTATUS
2) AllTables	44) HS_DISCHARGEMODES	87) INV_GOODRECEIVESOURCES	128) PATIENT_DIAGNOSES	169) TBL_REQUESTSTATUS
3) ARTICLE_MASTER	45) HS_DISCHARGEMODETYPES	88) INV_GRNCONDEMN	129) PATIENT_HABITS	170) TBL_ROOMSTATUS
4) BABY_DETAILS	46) HS_DISCHARGEMODETYPES1	89) INV_GRNCONDEMN_DEC	130) PATIENT_INVESTIGATIONS	171) TBL_STOCKTRANSACTIONS
5) BED_MASTER	47) HS_DISEASES	90) INV_GRNCONDEMN_SALE	131) PATIENT_JUDICIALINVOLVES	172) TBL_UPDATEMETHOD
6) BIL_DETAILS	48) HS_DISEASETYPES	91) INV_GRNDETAILS	132) PATIENT_MASTER	173) tblTest
7) CAL_MONTHS	49) HS_DRUGBATCHES	92) INV_GRNHEADER	133) PATIENT_PROCEDURES	174) THEATER_BACTERIOTEST
8) CAL_WEEKS	50) HS_DRUGCAT	93) INV_ISSUEDETAILS	134) PATIENT_PROCEDURESPERFORME	175) THEATER_DAILYCLEAN
9) CAL_YEARS	51) HS_DRUGCODES	94) INV_ISSUEHEADER	D	176) THEATER_MASTER
10) CLINIC_APPONITMENTS	52) HS_DRUGITEMS	95) INV_LOCATIONS	135) PATIENT_REG_COMPLAINTS	177) THEATER_SCHEDULE
11) CLINIC_CODES	53) HS_DRUGITEMS_old	96) INV_LOCCATEGORY	136) PATIENT_REG_JUDICIALINVOLVES	178) THEATER_SESSIONSTAFF
12) CLINIC_DOCTORS	54) HS_DRUGSTOCK	97) INV_REQUESTDETAILS	137) PATIENT_SPECIALCARE	179) THEATER_SPECIALCLEAN
13) CLINIC_DOCTORS1	55) HS_DRUGSTORES	98) INV_REQUESTHEADER	138) PATIENT_SYMPTOMS	180) THEATER_STAFF
14) CLINIC_PATIENTS	56) HS_EQUIPMENTCONDITION	99) INV_RETURNDETAILS	139) PATIENT_TRANSFER	181) THEATER_SURGERIES
15) CLINIC_PATIENTS_DET	57) HS_EQUIPMENTTYPES	100) INV_RETURNHEADER	140) PATIENT_TREATMENTS	182) THEATER_WEEKLYCLEAN
16) CLINIC_SCHEDULE	58) HS_HABITS	101) INV_STOCK	141) PATIENT_VITALSIGNS	183) UNIT_MASTER
17) DEATH_DETAILS	59) HS_HANDOSOU	102) LAB_ATTACHMENTS	142) PHA_GRNDETAILS	184) USER_RESULT_APPR
18) DELIVERY_DETAILS	60) HS_HOSPITALS	103) LAB_MASTER	143) PHA_GRNHEADER	185) WARD_ADD_DIS_DIRECT
19) Doctor	61) HS_LABTYPES	104) LAB_PATSPECIMENDETAILS	144) PHA_ISSUEDETAILS	186) WARD_ADD_INDIRECT
20) DOCTOR_MASTER	62) HS_OBSERVATIONS	105) LAB_PATSPECIMENHEADER	145) PHA_ISSUEHEADER	187) WARD_ADMISSIONS
21) dtproperties	63) HS_ORGANISM	106) LAB_RESULT_BIO	146) PHA_ISSUESUMDETAILS	188) WARD_MASTER
22) EQU_GRNCONDEMN	64) HS_Param	107) LAB_RESULT_DEFFICI	147) PHA_ISSUESUMHEADER	189) WARD_TRANS
23) EQU_GRNCONDEMN_DEC	65) HS_PARITY	108) LAB_RESULT_INVHIMO	148) PHA_LOCTRANSFERDETAILS	190) warddetails_sum
24) EQU_GRNCONDEMN_SALE	66) HS_PROCEDURES	109) LAB_RESULT_PATHLAB	149) PHA_LOCTRANSFERHEADER	191) trace_xe_action_map
25) EQUIPMENT_MASTER	67) HS_RADIOLOGYMETHODS	110) LAB_RESULT_PT	150) PHA_PATRETURNDETAILS	192) trace_xe_event_map
26) EQUIPMENT_REPAIRS	68) HS_REFERRALSTATUS	111) LAB_RESULTDETAILS	151) PHA_PATRETURNHEADER	
27) EQUIPMENTS_MEDICAL	69) HS_REGINDEX	112) LAB_RESULTDETAILS_ANTIB	152) PHA_RETURNDETAILS	
28) EQUIPMENTS_TOCONDEMN	70) HS_RESULT_MICROSCOPY	113) LAB_RESULTDETAILS_BONE	153) PHA_RETURNHEADER	
29) HIS_CLINICCONSULTANTS	71) HS_SPECIALCARECODES	114) LAB_RESULTHEADER	154) PHA_STOCKADJDETAILS	
30) HIS_CLINICDOCTORS	72) HS_SPECIMEN	115) LAB_SPECIMENDETAILS	155) PHA_STOCKADJHEADER	
31) HIS_INVENTORYTRANSACTIONS	73) HS_SPECIMEN_RESULT	116) LAB_SPECIMENDETAILS_ANTIBIOTI	156) PHARMACIST_MASTER	
32) HIS_OPDDOCTORS	74) HS_SURGERYDRUGS	C	157) RADIOLOGY_RESULTS	
33) HIS_STOCKTRANSACTIONS	75) HS_SURGERYEQUIPMENTS	117) LAB_TESTS	158) RADIOLOGY_UNITS	
34) HOSPITAL_MASTER	76) HS_SURGERYTYPES	118) MOTHER_DETAILS	159) ROOM_FACILITIES	
35) HS_ADMISSIONINDEX	77) HS_SYMPTOMCODE	119) OPD_DOCTORS	160) ROOM_MASTER	
36) HS_ADMISSIONTYPES	78) HS_TESTPARAMETERS	120) OPD_PATIENTS	161) STORE_KEEPERS	
37) HS_ANTIBIOTIC	79) HS_TESTS	121) OPD_ROOMS	162) SURGEON_MASTER	
38) HS_BODYPART	80) HS_THEATERTYPES	122) OPERATION_RECORDS	163) SURGERY_REQUESTS	
39) HS_CLINICREFFROM	81) HS_VITALSIGN	123) OPERATION_SPECIMEN	164) survey	
40) HS_CLINICREFTO	82) HS_VITALSIGNUNIT	124) PATIENT_ALLERGETICS	165) TBL_AGETYPES	
41) HS_CLINICTIMES	83) HS_WARDCATEGORY	125) PATIENT_BEDALLOCATION	166) TBL_HISTRANSACTYPES	
42) HS_DELIVERYMODE	84) HS_WARDSPECIALITY	126) PATIENT_CLINICALOBSERVATIONS	167) TBL_LOCATIONCATEGORY	
	85) HS_WARDTYPES			



*"We've phased out almost all of our legacy systems ..."*

brianmooredraws.com

# Migration

---

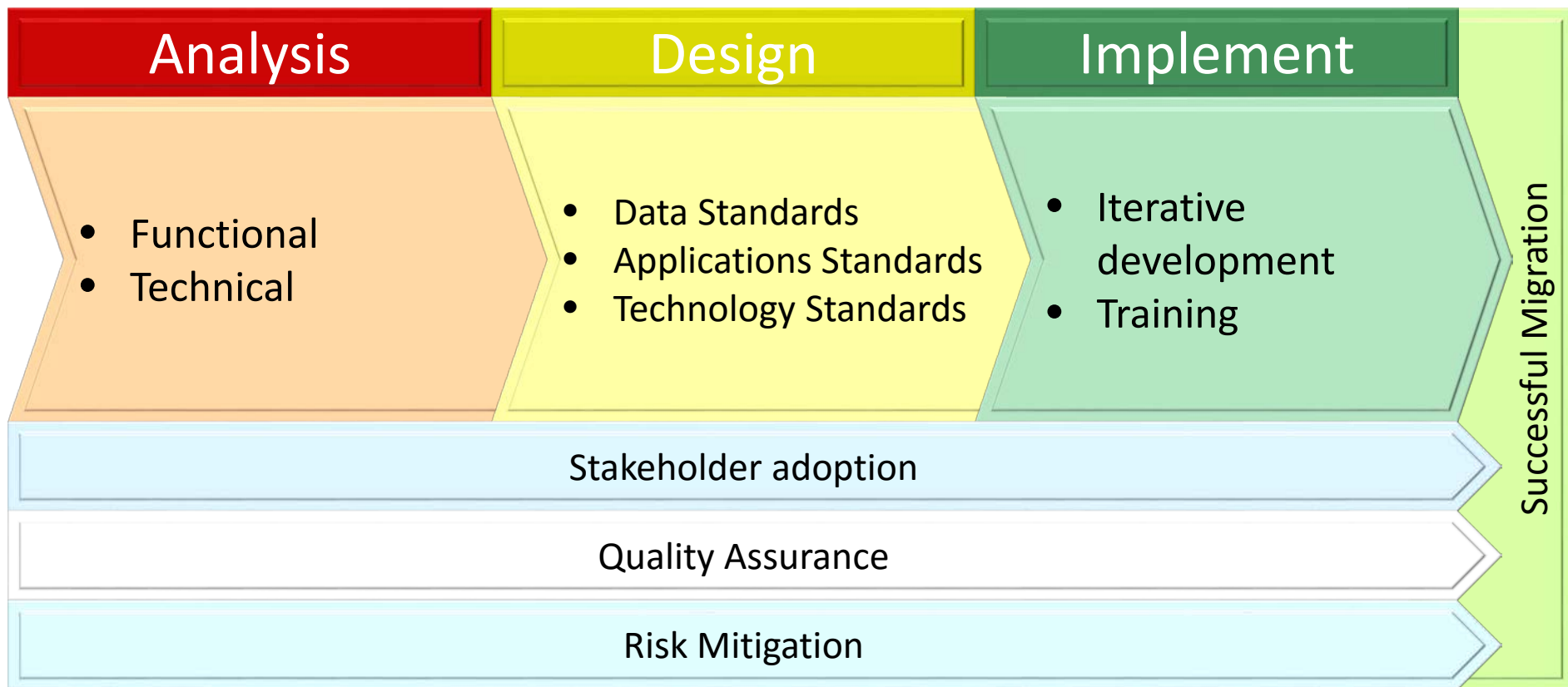
- transferring of IT resources
- newer hardware infrastructure or
- software platform
- to keep up with current technologies
- gain better value

# Goals

---

- Successful migration - applications / data
- Least disruption to work
- Predictable Timeline
- Adoption and use of migrated products and services

# Migration Plan



# Functional Analysis

---

- Need for functions
- Workflow
- Performance
- Usability

# Technical Analysis

---

- Architecture
- Portability
- Reliability
- Data

# Data

---

- Bad data
- Duplicate data
- Unknown or unenforced archiving
- Data dependencies

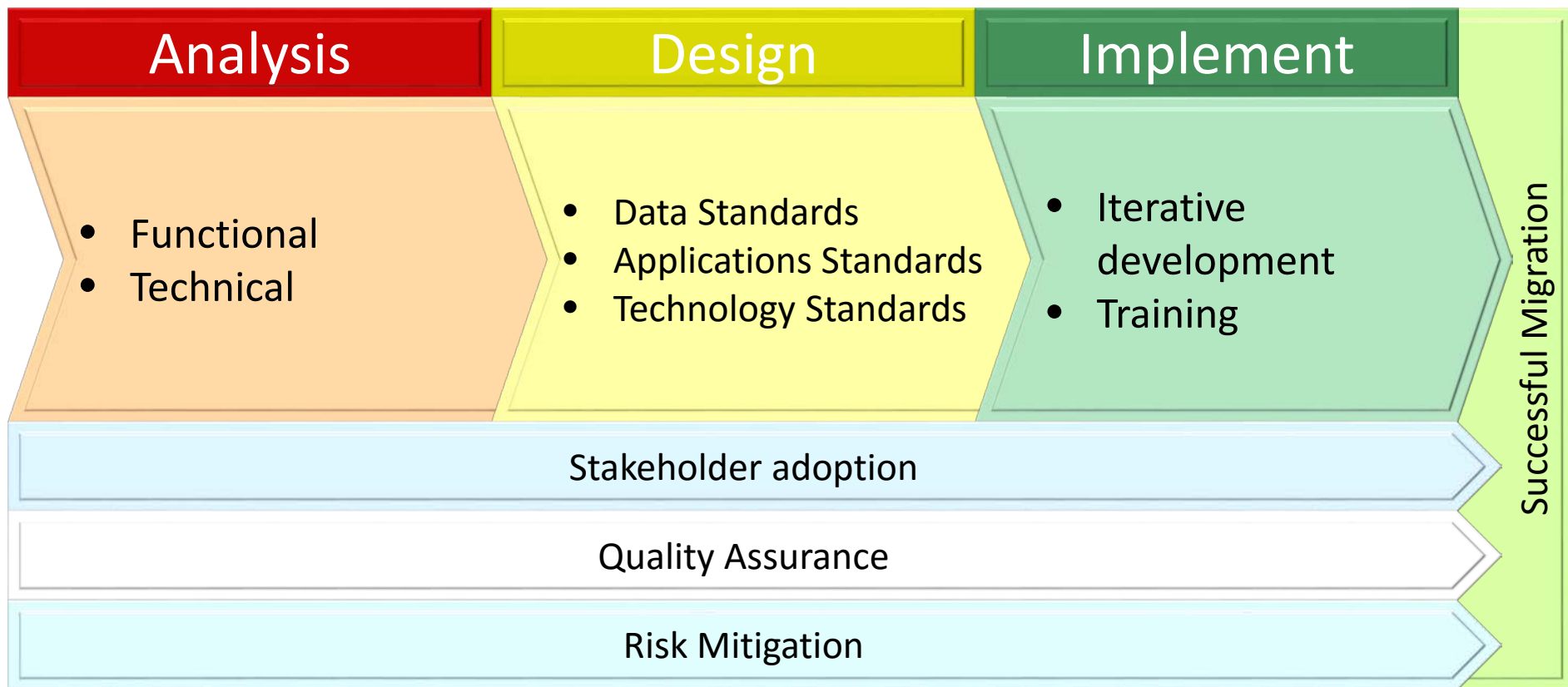


# Outcome – Functional/ Technical

---

- Retain
- Replace
- Refactor
- Retire
- Revise
- Rebuild
- Rehost

# Migration Plan

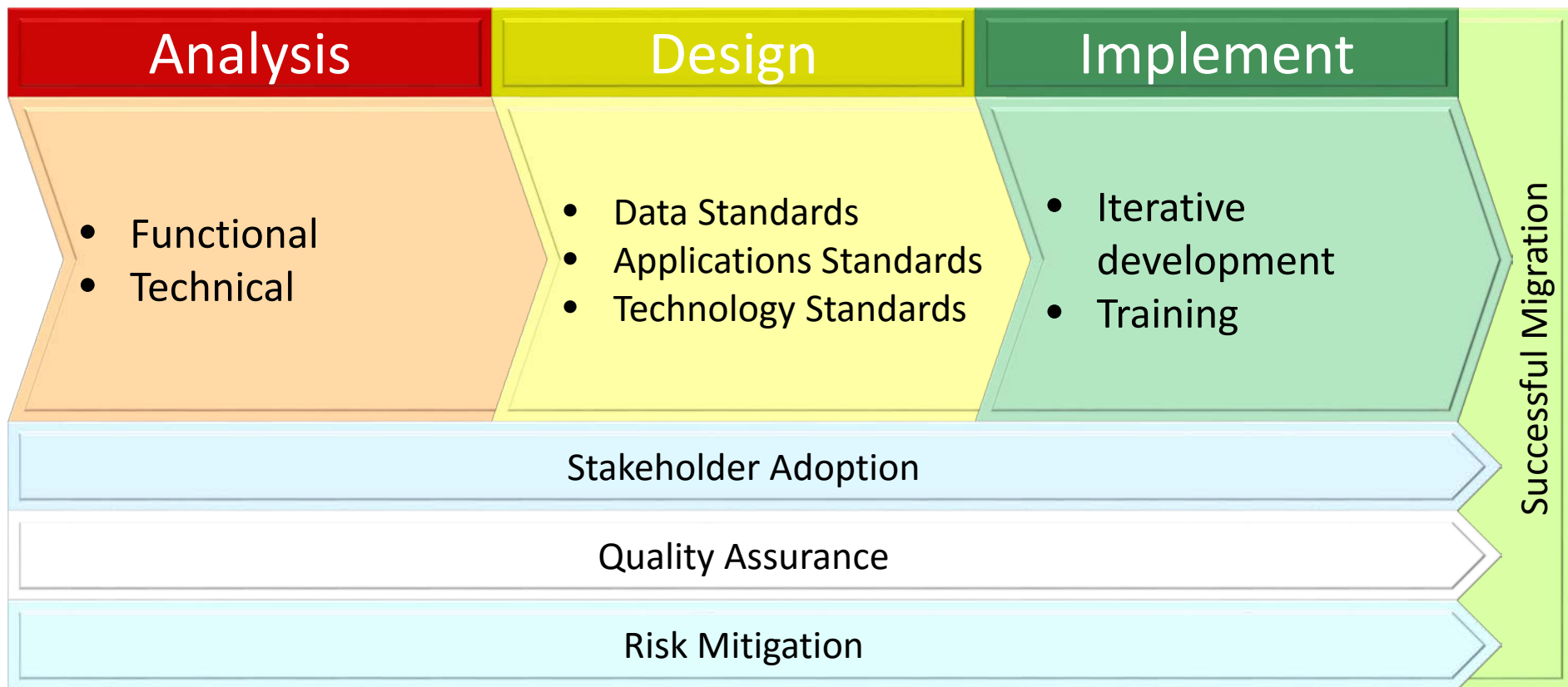


# Implementation

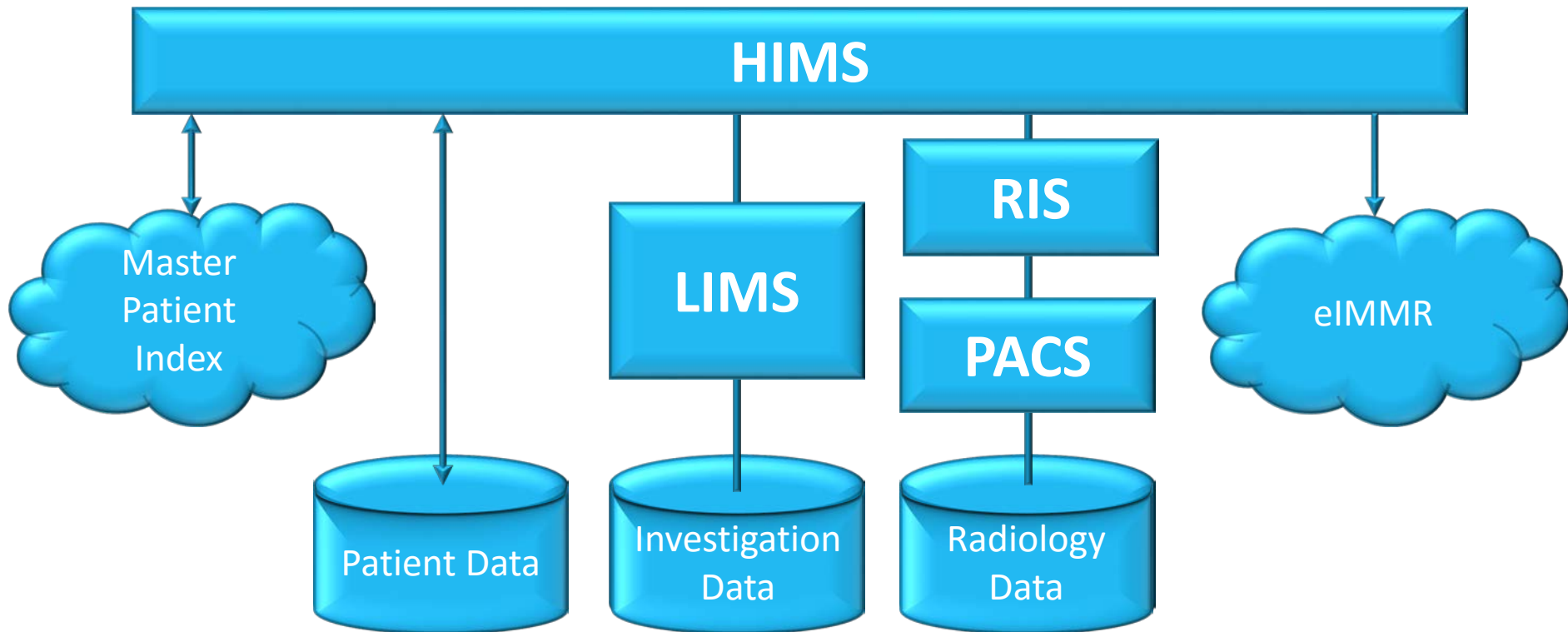
---

- Implementation priorities
- Deployment issues
- Development
- Training

# Migration Plan



# Final Outcome





# Thank you!

---

