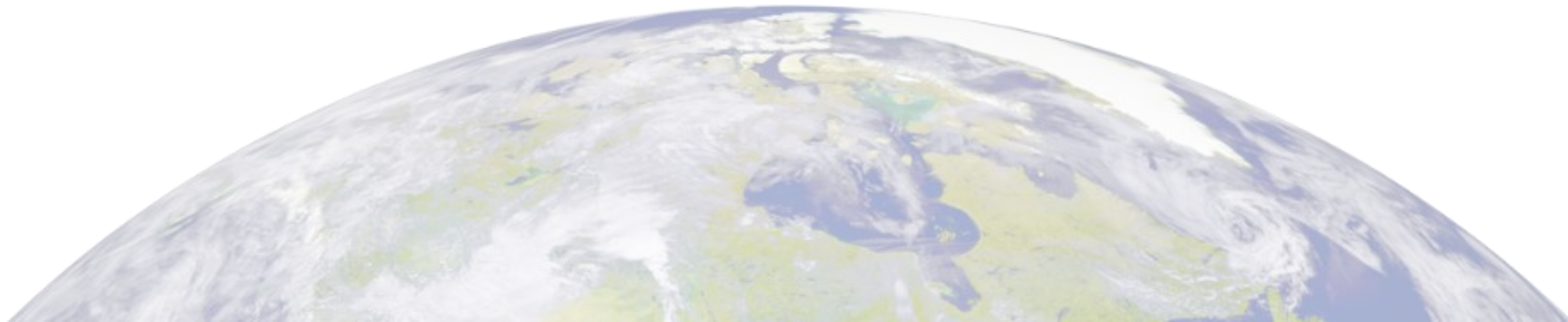# EMRAM – Benefits for the patient, the clinician and the hospital

![HIMSS Analytics®]

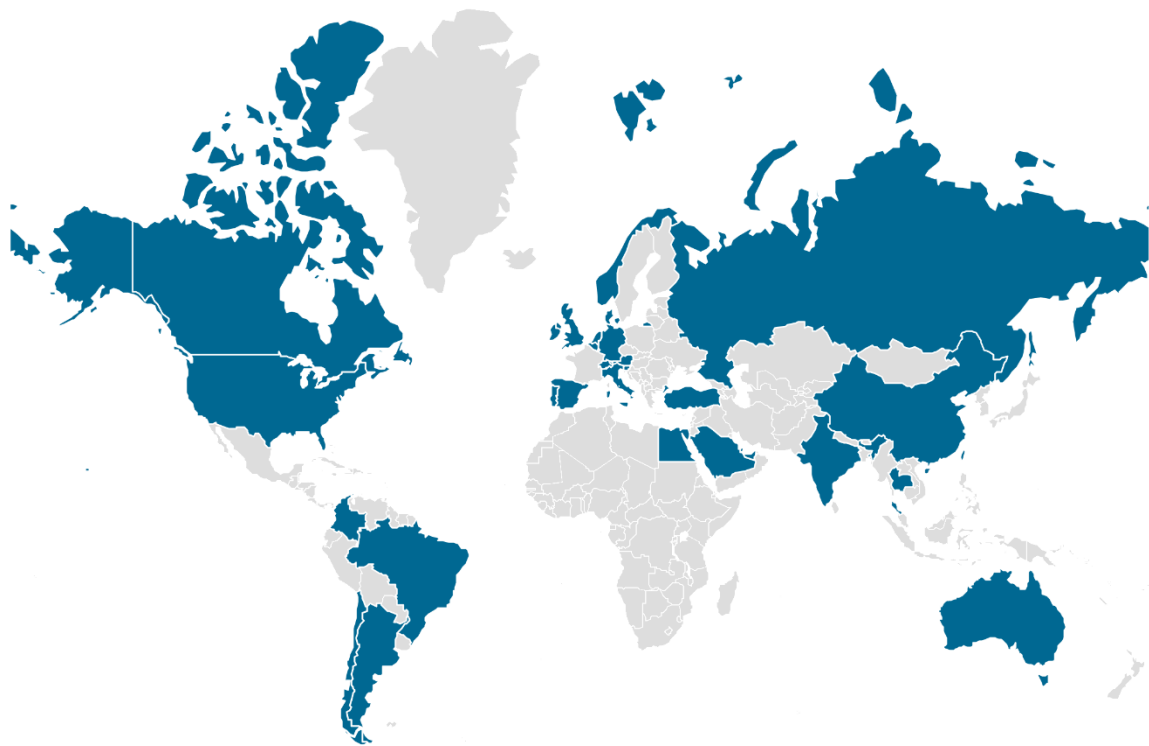# Maturity Model Impact: A Global View

World patient population impacted by healthcare institutions

using the standards of HIMSS Maturity Models

776,000,000+

HIMSS *Analytics*® Maturity Models Expand and Global Reach

EMRAM Stage 6/7

32 Countries

6,446 in **32**
EMRAM Hospitals Scored — Countries

56,383
O-EMRAM Physician Practices Scored

347 in **12**
EMRAM Stage 7 Hospitals — Countries

~2300 in **31**
EMRAM Stage 6 Hospitals — Countries

Hundreds
of Facilities Assessed Across Other Maturity Models

EMRAM

**Electronic
Medical Record
Adoption Model**

*Measuring EMR
capabilities and impact
on systems, and patients.*

O-EMRAM

**Outpatient Electronic
Medical Record
Adoption Model**

*Scoring healthcare clinics
on the maturity of their
EMR environments.*

AMAM

**Adoption Model for
Analytics Maturity**

*Determining how to
leverage data for better
care and process
optimization.*

H-SIMM

**Healthcare Supply
Information
Maturity Model**

*Transforming clinical
environments to support
quality, safety and
sustainability.*

CCMM

**Continuity of Care
Maturity Model**

*Assessing levels of care
coordination, systems
integration, and patient
engagement.*

INFRAM

**Infrastructure
Adoption Model**

*Improve care delivery,
reduce risk, and create a
pathway for infrastructure
development.*

DIAM

**Digital Imaging
Adoption Model**

*Evaluating maturity of IT
supported processes in
medical imaging in hospitals
and diagnostic centers.*

Ministerial assignments

Country	Model	Scope
Costa Rica	EMRAM and OEMRAM	20 Hospitals 30 Ebais
England	EMRAM	36 Hospitals
Poland	EMRAM	32 Hospitals
Slovakia	EMRAM	24 Hospitals
Turkey	EMRAM and OEMRAM	650 Hospitals

As a result of these projects, HIMSS Analytics provided the Ministry of Health with the following reports and presentations:

A Short gap analysis for each care provider

An EMRAM assessment report, i.e. a summary of findings for all assessed hospitals, containing key findings, conclusions and recommendations as well as detailed information about software availability, medication safety, key performance indicators and EMRAM level achievements

On-line presentation containing key findings and recommendations

Contact on many levels

Hospitals	Community and Ambulatory providers	Regions	Health Ministries
EMRAM	OEMRAM	EMRAM	EMRAM
OEMRAM		OEMRAM	OEMRAM
AMAM		CCMM	

HIMSS Analytics accepts commissions from individual care providers such as hospitals (CIO or CCIO). Regional representatives / commissioning organisations and Health Ministries. All the models measure adoption in individual organisations whilst also serving as a proxy for an entire region / country.

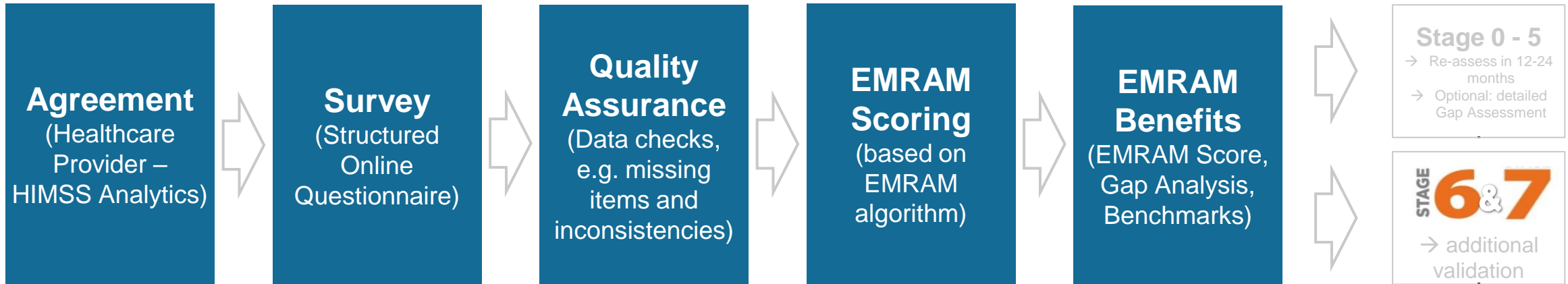| STAGE	HIMSS Analytics EMRAM EMR Adoption Model Cumulative Capabilities
7	Complete EMR; External HIE; Data Analytics, Governance, Disaster Recovery, Privacy and Security
6	Technology Enabled Medication, Blood Products, and Human Milk Administration; Risk Reporting; Full CDS
5	Physician documentation using structured templates; Intrusion/Device Protection
4	CPOE with CDS; Nursing and Allied Health Documentation; Basic Business Continuity
3	Nursing and Allied Health Documentation; eMAR; Role-Based Security
2	CDR; Internal Interoperability; Basic Security
1	Ancillaries - Laboratory, Pharmacy, and Radiology/Cardiology information systems; PACS; Digital non-DICOM image management
0	All three ancillaries not installed

Electronic Medical Record Adoption Model (EMRAM) Description

In order to provide the healthcare information technology (IT) industry with a framework for assessing the maturation of electronic medical record (EMR) adoption in hospitals, HIMSS Analytics (the premier collector of hospital IT inventory information in the world) leveraged the information in the HIMSS Analytics Database® to create the HIMSS Analytics Electronic Medical Record Adoption Model[SM].

The EMRAM is based on a proprietary methodology and algorithm to assist hospitals on their journey to implement components of an EMR.

The resulting EMRAM score a hospital receives reflects the hospital's EMR capabilities as it progresses from EMRAM stage 0, a paper-based environment, to EMRAM stage 7 in which all care processes are supported with electronic documentation and advanced analytic capability. The EMRAM score identifies the current level of EMR maturity and helps to explain and set out the path to a complete EMR and participation in an electronic health record (EHR).

HIMSS Analytics have been invited by the *Centre for Health Information Systems* (CSIOZ) to apply the international EMRAM standards to evaluate **32 hospitals** supervised by the MoH of Poland.

CSIOZ, a state budget unit appointed by the MoH, is responsible for monitoring of planned, developed and maintained ICT systems at the central and regional levels.

This assessment has delivered a baseline measurement / position that can be used to accurately assess the effect of local or central investments either from individual hospital or from CSIOZ.

Oct' 17 — **Workshops with key stakeholders** (2 days on-site, 10/12/17 – 10/13/17)

Oct' 17 — **EMRAM data collection** (10/16/17 – 11/15/17)

Nov' 17 — **Quality assurance** (10/24/17 – 11/16/17)

Dec' 17 — **Final presentation & report delivery** (12/15/17 & 12/19/17)
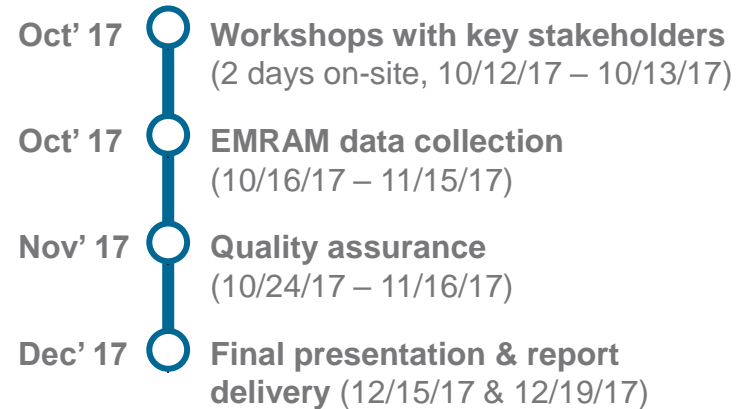
Project time plan: 2 months, 10/12/17 – 12/19/17

Selected results:

- EMR adoption is below the average EMRAM scores of hospitals in Europe, the US and the Middle East.
- All but one hospital have an electronic medical record (EMR) for processing clinical patient data.
- Low technology related expenditure when compared with other European countries.
- The age of the software applications in use is relatively young when compared with other European hospitals.
- Key software applications currently missing in many of the hospitals surveyed are Intensive Care Unit Management Systems, EMAR, and E-Prescribing with CDS.
- The surveyed hospitals presented highly mature informatics environments in the areas of Pharmacy (Stock) Management, Physician Documentation, Electronic Patient Records, Radiology Information Systems and PACS.
- Protecting hospitals from cyber-attacks and patient data from unauthorized access should be embedded in any refinement of the current IT strategy.

As a result of the project, HIMSS Analytics provided the Polish Ministry of Health with the following reports and presentations:

- Short gap analysis for 32 surveyed hospitals
- EMRAM assessment report, i.e. a summary of findings for all assessed hospitals, containing key findings, conclusions and recommendations as well as detailed information about software availability, medication safety, key performance indicators and EMRAM level achievements
- On-line presentation about key findings and recommendations for key project stakeholders from CSIOZ

EMRAM Assessments – An example from Slovakia

HIMSS Analytics have been invited by the Ministry of Health of the Slovak Republic to apply the international EMRAM standards to **11 hospitals** managed by the MoH.

The MoH recognized the significance and the opportunities presented by the use of technology in the healthcare environment and was looking to capitalize on that opportunity.

The evaluation allowed assessing the current state of advancement of the use of IT in hospitals and resulted in recommendations that allow planning investments in ICT for the medical institutions under investigation.

Feb' 18 — Kick-off meeting with key stakeholders (02/02/18)

Feb' 18 — EMRAM data collection (02/07/18 – 07/03/18)

Mar' 18 — Quality assurance (03/02/18 – 07/03/18)

Aug' 18 — Final presentation & report delivery (08/06/18 – 08/08/18)

Project time plan: 6 months, 02/02/18 – 08/08/18

Selected results:

- All hospitals have implemented an electronic medical record (EMR) for processing clinical data.
- A radiology PACS for quick availability of digital images from radiological exams is available in all hospitals with radiology services.
- All but one hospital use patient administration systems. Main functions provided typically include MPI, ADT, registration, patient scheduling, waiting list management and reporting.
- Most frequently missing software applications are VNA, CPOE, chronic disease management system, departmental solutions for oncology, and dictation with speech recognition.
- All hospitals have EMR access control models in place but a system that monitors a network for malicious activities such as security threats or policy violations is often missing.
- Business continuity processes allowing access to relevant patient information during system downtimes is present in 1 out of 3 hospitals.
- Half of hospitals use a system to document when medications are given to a patient during a hospital stay.
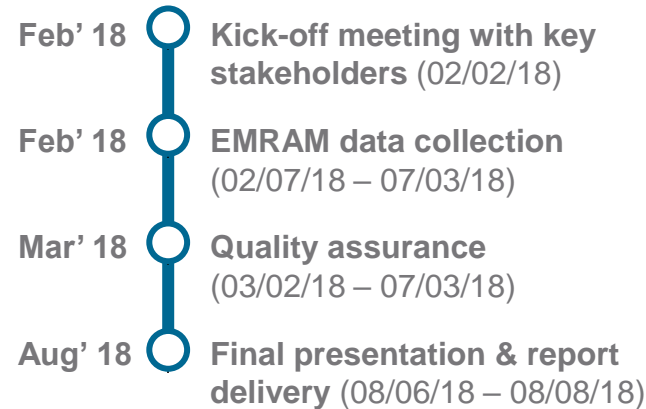
As a result of the project, HIMSS Analytics provides the Slovakian Ministry of Health with the following reports and presentations:

- Short gap analysis for 11 surveyed hospitals
- EMRAM assessment report, i.e. a summary of findings for all assessed hospitals, containing key findings, conclusions and recommendations as well as detailed information about software availability, medication safety, key performance indicators and EMRAM level achievements
- On-site presentation about key findings and recommendations for key project stakeholders from the Slovakian Ministry of Health

In 2013, the Turkish MoH and HIMSS established a relationship to evaluate the status of EMR adoption in public hospitals and to support strategic decisions from public authorities, hospitals and the industry with regard to investments, staffing, budgets etc.

Between 01/2014 and 12/2017 HIMSS Analytics applied the international EMRAM standards to more than **650 Turkish public hospitals**.

Of these hospitals, 165 have successfully validated against the EMRAM Stage 6 standards and 1 has been validated against the EMRAM Stage 7 standards.

Mar' 14 — **Data collection workshop** with representatives from > 140 hospitals

Apr' 14 — **Quality assurance**

May' 14 — **EMRAM scoring** and **Gap Analysis**

Jun' 14 — **Event HIMSS Turkey**

Dec' 14 — **Data collection workshop** with representatives from > 250 hospitals

Jan' 15 — **Quality assurance**

Feb' 15 — **EMRAM scoring** and **Gap Analysis**

Mar' 15 — **Event HIMSS Turkey**

May' 15 — **Educational workshop** and c**ontinuously data collection**

Feb' 16 — **Educational workshop** and c**ontinuously data collection**

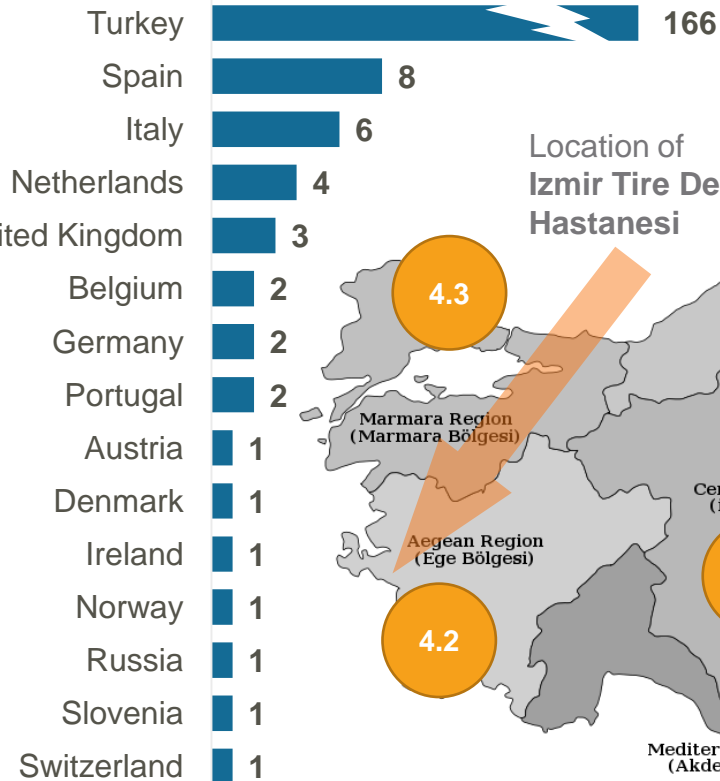**Selected results from the Essentials Report 2016**

- There are hardly any self-developed solutions in use, mainly due to the fact that in-hospital IT support is not common in Turkey.
- Competition is restricted by the predominance of few large players mostly providing complete HIS-suites.
- The Turkish hospital IT market is growing. Activities related to buying, replacing or upgrading hospital software in Turkey are high in a European context when we look at the number of investment plans.
- Turkish hospitals spend on average 1.8% of their total annual hospital operating expenses on IT (annual IT operating expense as a share of total hospital operating expense).
- Whilst the share of operational expenses for IT is just a little lower than the Western European average, the absolute amounts (in TRY) are significantly lower.

As a result of the project, HIMSS Analytics provides the Turkish Ministry of Health with the following reports and presentations:

- Short gap analysis for all surveyed hospitals
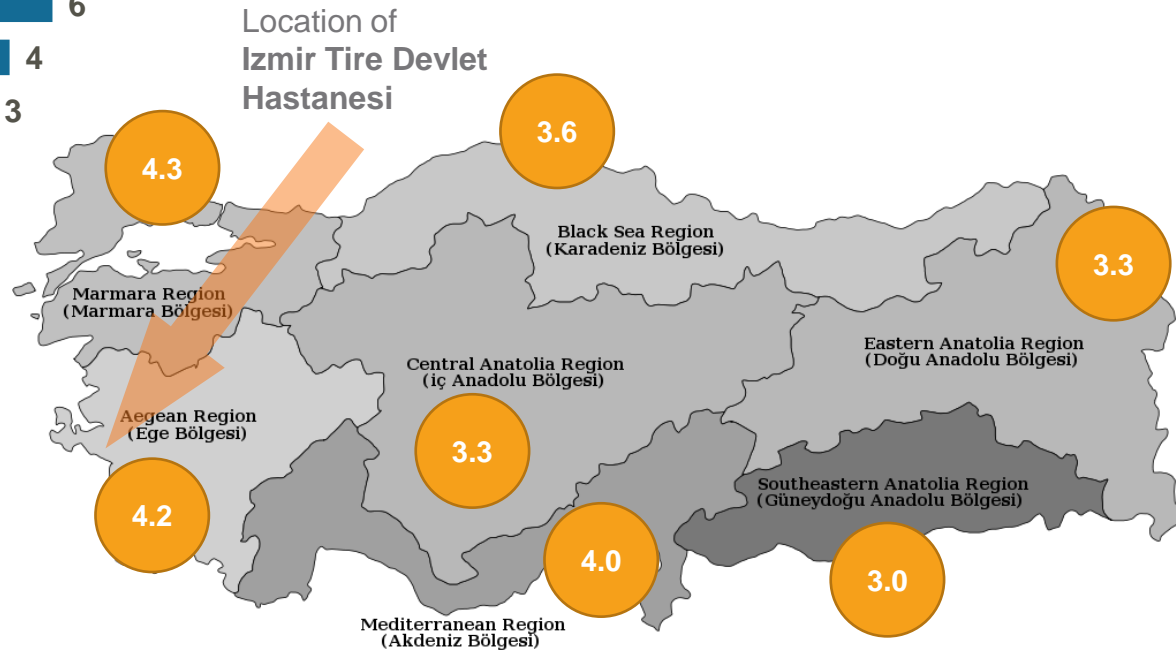- EMR Market Essentials Report in 2015 and 2016, i.e. key performance indicators and clinical IT support metrics, IT infrastructure (market penetration, deployment scope & age profiles of applications, integration with EMR, medication safety, image management, IT budget availability, key vendors & market competition)
- On-site presentation about key findings at HIMSS Turkey events

HIMSS *Analytics*®

European EMRAM Stage 6 & 7 Awardees

Country	Count
Turkey	166
Spain	8
Italy	6
Netherlands	4
United Kingdom	3
Belgium	2
Germany	2
Portugal	2
Austria	1
Denmark	1
Ireland	1
Norway	1
Russia	1
Slovenia	1
Switzerland	1

Mean EMRAM Score Turkey = 3.7

Location of **Izmir Tire Devlet Hastanesi**

Marmara Region (Marmara Bölgesi) — 4.3

Black Sea Region (Karadeniz Bölgesi) — 3.6

Eastern Anatolia Region (Doğu Anadolu Bölgesi) — 3.3

Central Anatolia Region (İç Anadolu Bölgesi) — 3.3

Aegean Region (Ege Bölgesi) — 4.2

Mediterranean Region (Akdeniz Bölgesi) — 4.0

Southeastern Anatolia Region (Güneydoğu Anadolu Bölgesi) — 3.0

Selected highlights from the 1st Turkish Stage 7 hospital:

- **Reduced the use of human albumin** by 48% in 2015 compared to 2014. This has so far resulted in savings in excess of 69,000 Turkish Lira (= 22,900 €, Exchange rate of 2015)
- **Reduced the number of late cancer presentations** and in doing so detected 16 cases of early cancer in 2015. This was achieved by working in association with the Tire Public Health department and creating reminders for referring clinicians.
- **Reduced consultation access time** from 30 mins to within the 20 minute target. This is achieved by using a pop up message every minute until a response is initiated.
- **Reduced the number of patients requiring a blood transfusion** by identifying candidates for auto transfusion prior to TKR and THR. This resulted in 70% savings in 2015 compared with the previous year.
- **Reduced length of stay** by 26% despite a 30% increase in orthopaedic inpatient activity. This is achieved by ordering rehabilitation assessments earlier and better use of the bed management system.

"It is an honor for us to be amongst the top four hospitals in Europe when it comes to digital maturity. The recognition we have received reflects the team's hard work and effort and we look forward to keeping up the standards for the next three years, until our hospital is next validated in 2019."

Dr Gürhan ZİNCİRCİOĞLU, CMIO and MD at Tire Public Hospital

The gap overview report….

A typical report from a Stage 3 hospital….

❑ Stages 0 - 5

- Survey (varies: phone, worksheet, web)
- Self-reported assessment

❑ Stage 6 on-site Validation

- Capability and intent
- Focus on model fundamentals
- Preparatory guide provided with clear requirements
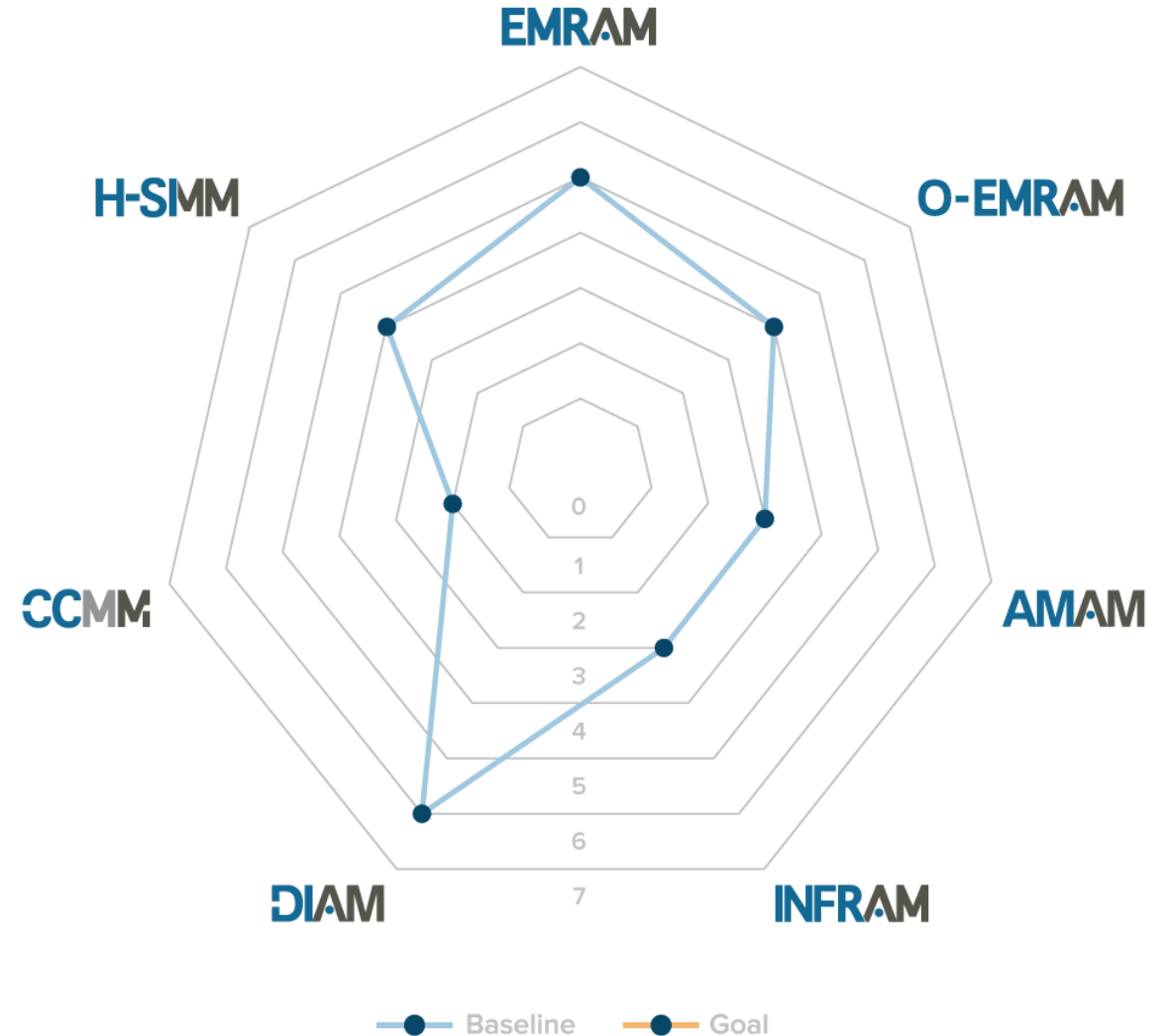- Valid for 3 years

❑ Stage 7 on-site Validation

- Focus on advanced capabilities, strong case studies, strategic alignment
- Preparatory guide provided with clear requirements
- Valid for 3 years

Digital Profile – Baseline

Use the self-assessment tools to determine the current status of an organisations maturity within each model.
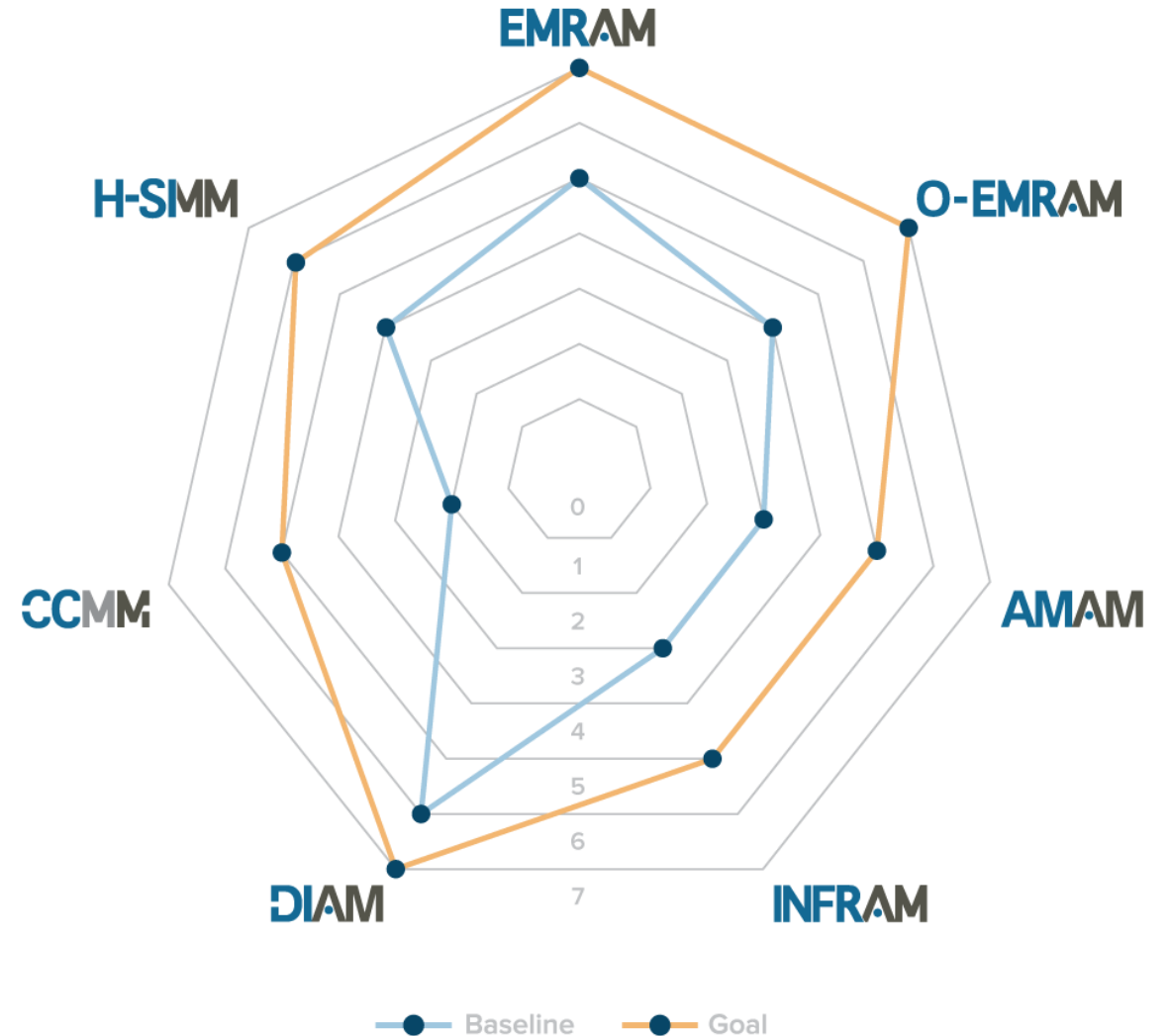
Digital Profile – Goal

Use the models to establish an organizational baseline position

Agree with clinical and organisational leaders their level of ambition
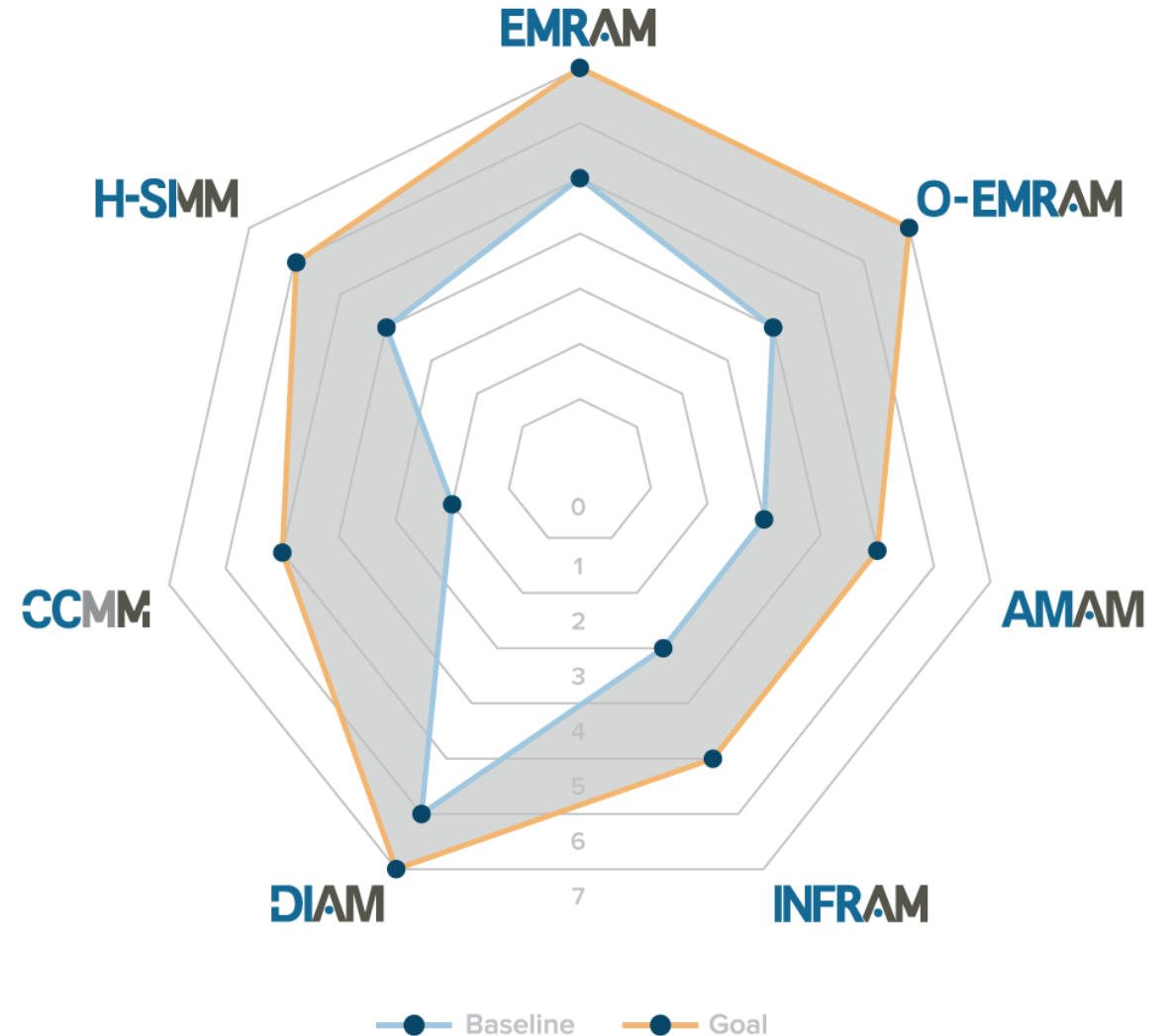
Create the roadmap

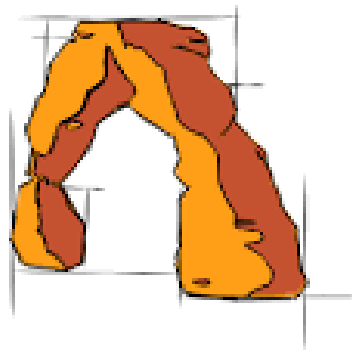*EMRAM & O-EMRAM are base models and expected to be Stage 7*

Digital Profile – Opportunity

The grey area represents the project scope and business opportunity.

Not about reaching Stage 7 but improving capabilities and maximising technology investments and resources available.

Benefits at Stage 7 – Acute Care

Benefits at Stage 7

"I see first hand during EMRAM and OEMRAM validations that there are organizations that are excited about their EMR and the benefits they are deriving from its use."

- *Philip Bradley, Regional Director HIMSS Analytics*

Is there a correlation between the Arch Collaborative MD satisfaction and the EMRAM Stages?

HIMSS EMRAM Stage	Count of Unique Hospitals	Count of Physicians Surveyed	Physician Net EHR Experience Score	Percent of Hospitals with Positive Physician Net EHR Experience Score
US Hospitals Not on Stage 6/7 Validated List	63	3,769	6.6	67%
Stage 6 Hospitals	145	14,528	17.5	74%
Stage 7 Hospitals	65	5,226	33.8	95%

Data Sources Used

- HIMSS Analytics publically available list of Stage 6 & 7 organizations (US Only)
- KLAS Arch Collaborative survey data (MDs responses only)

Method

- Matching organizations in the Arch Collaborative to HIMSS Stage 6 & 7 organizations

Benefits at Stage 7
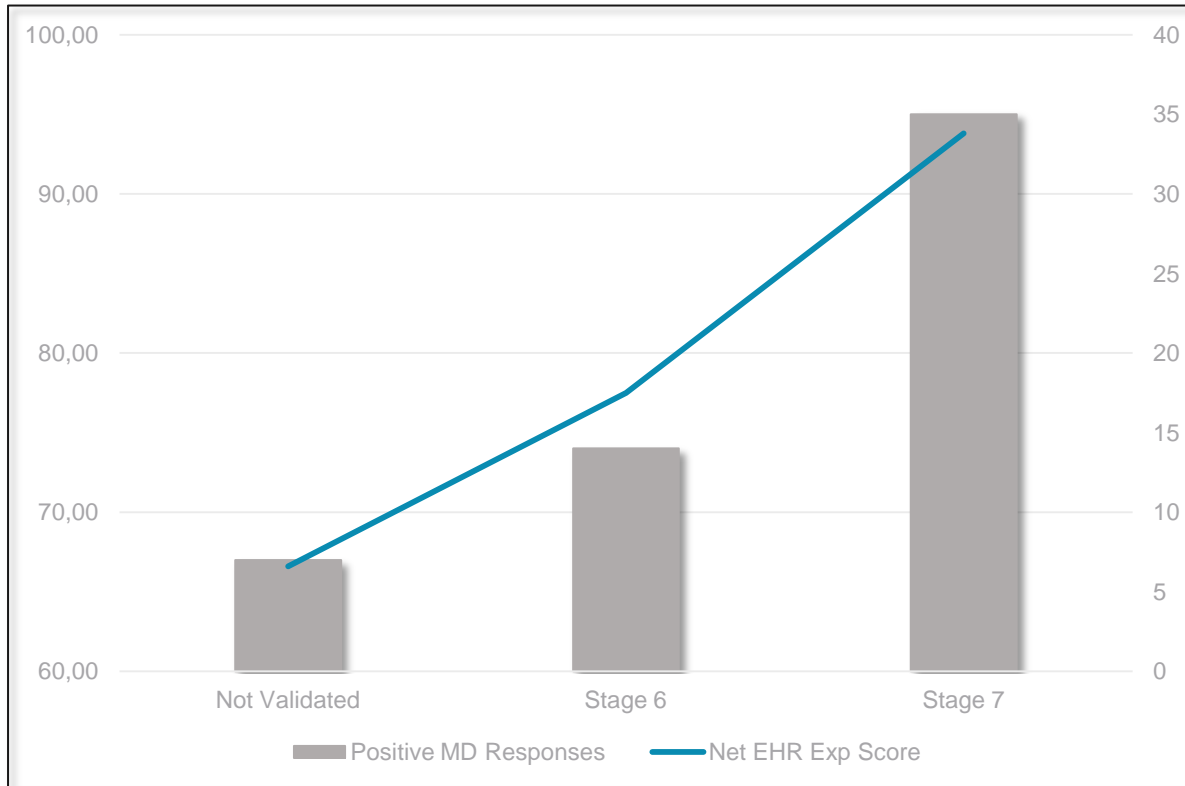
"The jump in satisfaction is statistically significant (p<.001) and very large. Especially meaningful is that of the 65 stage 7 hospitals, 95% of them had a positive Net EHR Experience Score—that is really amazing to us."

Taylor Davis, KLAS
VP of Innovation

"Only included hospitals which had more than 15 physician responses, and we only included physician responses."

HIMSS Analytics®

Benefits at Stage 7

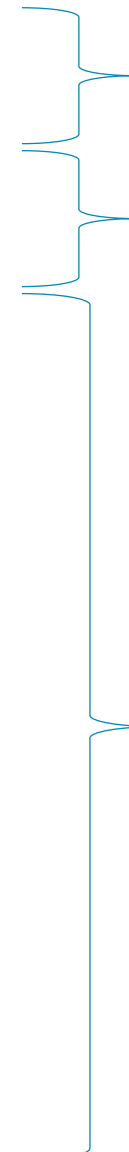| STAGE	HIMSS Analytics® EMRAM — EMR Adoption Model Cumulative Capabilities	
7	Complete EMR; External HIE; Data Analytics, Governance, Disaster Recovery, Privacy and Security	6%
6	Technology Enabled Medication, Blood Products, and Human Milk Administration; Risk Reporting; Full CDS	36%
5	Physician documentation using structured templates; Intrusion/Device Protection	
4	CPOE with CDS; Nursing and Allied Health Documentation; Basic Business Continuity	
3	Nursing and Allied Health Documentation; eMAR; Role-Based Security	58%
2	CDR; Internal Interoperability: Basic Security	
1	Ancillaries - Laboratory, Pharmacy, and Radiology/Cardiology information systems; PACS; Digital non-DICOM image management	
0	All three ancillaries not installed	**The U.S. Market**

Benefits at Stage 7

HIMSS Analytics® EMRAM

EMR Adoption Model Cumulative Capabilities

STAGE	
7	Complete EMR; External HIE; Data Analytics, Governance, Disaster Recovery, Privacy and Security
6	Technology Enabled Medication, Blood Products, and Human Milk Administration; Risk Reporting; Full CDS
5	Physician documentation using structured templates; Intrusion/Device Protection
4	CPOE with CDS; Nursing and Allied Health Documentation; Basic Business Continuity
3	Nursing and Allied Health Documentation; eMAR; Role-Based Security
2	CDR; Internal Interoperability: Basic Security
1	Ancillaries - Laboratory, Pharmacy, and Radiology/Cardiology information systems; PACS; Digital non-DICOM image management
0	All three ancillaries not installed

The Danger Zone

WHY?

STAGE	HiMSS Analytics® EMR·AM — EMR Adoption Model Cumulative Capabilities
7	Complete EMR; External HIE; Data Analytics, Governance, Disaster Recovery, Privacy and Security
6	Technology Enabled Medication, Blood Products, and Human Milk Administration; Risk Reporting; Full CDS
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1	Ancillaries - Laboratory, Pharmacy, and Radiology/Cardiology information systems; PACS; Digital non-DICOM image management
0	All three ancillaries not installed

The Danger Zone

Benefits at Stage 7

At Stage 4 & 5 Dr's are introduced to CPOE and Documentation.

At these stages the medical record is a hybrid mix of online and paper. It can only provide rudimentary clinical decision support to the Dr.

Benefit and Value….

- Benefits of using an Electronic Patient / Medical Record System

- Benefits being able to benchmark and compare

- Benefits and value of being a Stage 6/7 hospital

Value and Benefit....

- **Benefits of using technology**
  - Reducing sepsis and sepsis related mortality
  - Reducing Length of Stay
  - Reducing the number of in patient falls and harm from falls
  - Reducing the number and severity of adverse drug events
  - Reducing the number of inappropriate investigations and X ray examinations

Value and Benefit…

- **Measurement and Benchmarking**
  - Investment in technology and patient safety
  - Investment in technology and improved clinical care
  - Higher levels of patient and staff satisfaction
  - Improved staff retention and recruitment
- **Third party attestation**
  - The EMRAM score helps to measure and compare

HiMSS *Analytics*®

Value and Benefit…

- **Being an EMRAM Stage 6/7 hospital**
  - Paying lower insurance premiums in those countries where such schemes exist (NHS Resolution formerly NHS Litigation Authority)
  - Members of staff are less likely to move from Stage 7 hospitals to Stage 4 hospitals than they are between Stage 6 hospitals thus staff retention is a factor
  - Being more likely to withstand legal claims involving record keeping, data loss and medical negligence
  - Being more attractive to those who pay and commission (PCT's and insurance companies) Regulators in some countries require hospitals to be at Stage 6
  - Being more competent, safe and outwardly sophisticated to those who regulate (CQC, JCI)
  - Greater levels of patient satisfaction and patient confidence in those countries who measure these parameters (Higher NPS and Family and Friends score)

Value and Benefit…

- **Being an EMRAM Stage 6/7 Hospital**
  - Modernisation, managing successful change, innovation, clinical engagement, strong leadership and the ability to successfully invest
  - Attracting positive attention from others who wish to learn, emulate and use for reference purposes
  - Potential financial remuneration from system suppliers in return for reference site status
  - The ability to withstand ministerial, MoH and other forms of political scrutiny
  - Kudos, respect and other forms of reward and privilege. (Invited to join national committees, reference opportunities, speaking and presenting opportunities, councils etc)
  - Stage 7 hospitals in some countries often have the ability to influence thinking, strategy and product development

HiMSS *Analytics*®

Thank you

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