



udla.

**Primer Workshop Internacional de
Informática Médica - Salud Digital**

**MODELOS DE MADUREZ EN
SALUD DIGITAL**

**VICEPRESIDENCIA DE LA
REPÚBLICA DEL ECUADOR**

 **Gobierno**
del Encuentro | Juntos
lo logramos

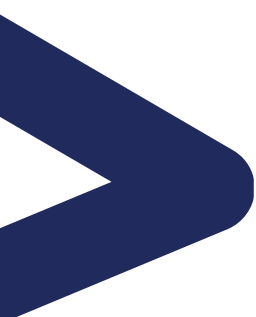
 República
del Ecuador

Dr. Claudio Giulliano

MD, MSc, PhD, CPHIMS

Médico, maestría y doctorado en Informática en Salud y Certified Professional in Healthcare Information and Management Systems (CPHIMS). Como experto en salud digital, Claudio tomó parte en importantes proyectos en hospitales, plan de salud, empresas de tecnología y gobierno. También fue presidente de la Sociedade Brasileira de Informática em Saúde (SBIS). Actualmente, es CEO de FOLKS Consultoria em Saúde Digital (HIMSS Digital Health PREMIER partner). Mas detalles en <http://linkedin.com/in/claudiogiulliano>.





Our mission is to **accelerate** digital transformation in healthcare, contributing with **knowledge, methodology and technology.**



Colaboración



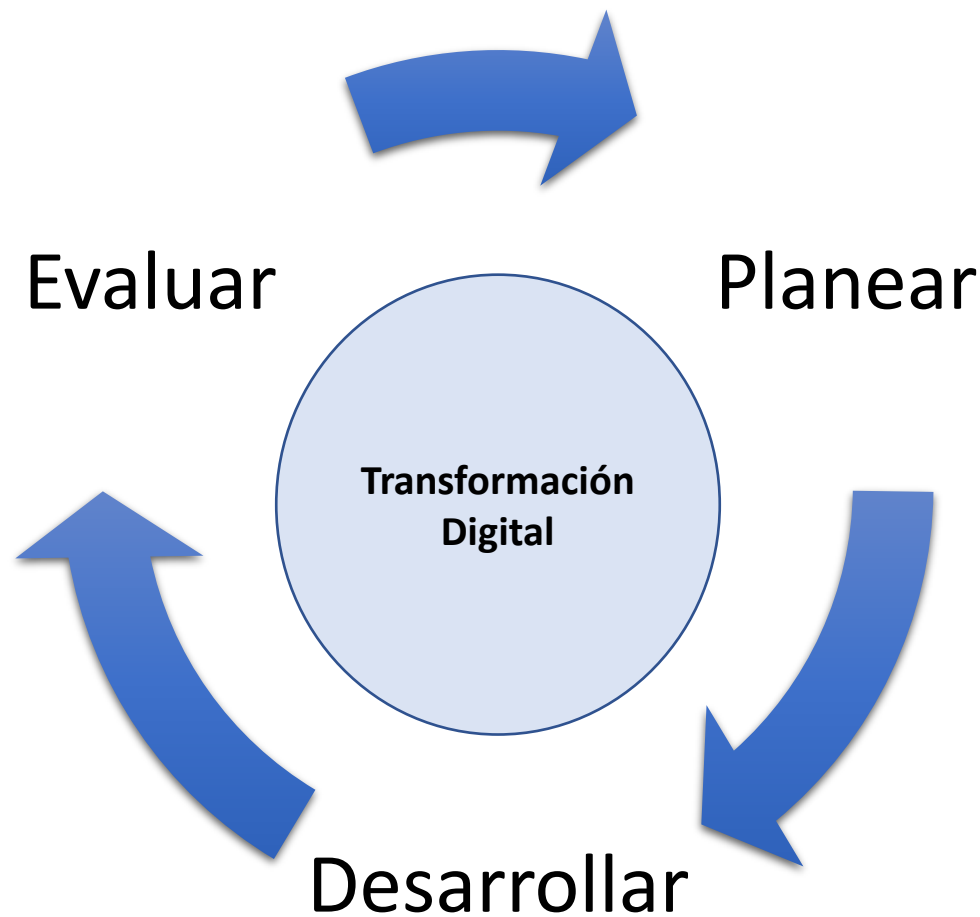
HIMSSSM

**DIGITAL HEALTH
TECHNOLOGY
PARTNER
PREMIER**



Official partner for Latin
America

Etapas de la Transformación Digital



Evaluación de la Madurez Digital



Auto-evaluación

Encuesta

Visita Diagnóstica

Certificación



Digital Maturity Index for Healthcare by FOLKS

Evaluación simple para **monitorear** la transformación digital



HIMSSSM

Evaluación completa para **guiar** a transformación digital

Que es el DMI-H?



Digital Maturity Index for Healthcare (DMI-H) by FOLKS es un índice porcentual que define o nivel de digitalización de una institución de salud, considerando a adopción de la tecnología e la preparación para a jornada digital.

El índice está basado en una auto-evaluación simples a través de una encuesta on-line, disponible en español, inglés y portugués.



Digital Maturity Index for Healthcare by FOLKS

Índice de Madurez Digital en Salud



DMI  **H**

Digital Maturity Index for Healthcare by FOLKS



digitalmaturityindex.health

DMI-H: Dimensiones y Dominios



Digital Maturity Index for Healthcare

Adopción de la Tecnología

Preparación para la Jornada Digital

Servicios y
Aplicaciones

Infraestructura
y Arquitectura

Datos y
Informaciones

Estructura y
Cultura

Estrategia e
Gobernanza

Índice de Maduridade Digital da Saúde

2/10



20%

Datos de la Institución

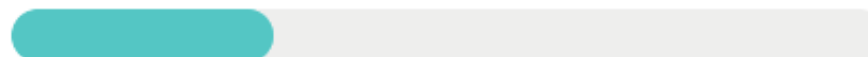
* Institución

* Código postal

* País

Índice de Maduridade Digital da Saúde

3/10



30%

Perfil de la Institución

* Naturaleza Jurídica

- Privado con animo de lucro
- Privado sin animo de lucro
- Público de gestión directa
- Público de gestión tercera

* Categoría de la Institución

- Hospital

Índice de Maduridade Digital da Saúde

5/10



50%

Servicios y Aplicativos

Conteste a las siguientes preguntas indicando su nivel de madurez para cada segmento solicitado.

Cada pregunta tiene un rango de 1 a 5, donde 1 indica poca o ninguna madurez, mientras que 5 indica muy alta madurez.

Al ingresar al nivel 2, confirme que ha alcanzado el nivel 1. Al ingresar al nivel 3, confirme que se cumplen los niveles 1 y 2; etc

Si la pregunta no tiene sentido para la realidad de su institución, marque la opción "No aplicable". (Por ejemplo: el control de pie de cama no se aplica a los consultorios médicos que no tienen administración de medicamentos).

* Personal de TIC

¿El personal de TIC está estructurado y es capaz de apoyar la transformación digital de la institución?

Sin una estructura organizada

1

Equipo de TIC con perfil muy técnico

2

Analistas de negocios con experiencia en salud

3

Equipo multidisciplinario con profesionales de TIC y de atención clínica

4

Líderes especializados en salud digital (CMIO y CNIO)

5

* Cultura de la Organización

¿Existe una cultura en la institución que privilegia e impulsa la adopción de tecnologías digitales?

Cultura conservadora, preferencia por procesos manuales

1

Resistencia al cambio en sectores aislados

2

Profesionales de la asistencia sin resistencia al cambio

3

Algunos gerentes involucrados en la transformación digital

4

Todos los empleados son aficionados y seguidores de la transformación digital

5

Índice de Maturidade Digital da Saúde

Muito obrigado **Claudio Giulliano** do(a) **Hospital Exemplo S/A** pelo seu interesse em saber o nível de maturidade digital da sua instituição!

O Índice de Maturidade Digital para Saúde (DMI-H) da sua instituição é

64.39%



Jornada para se tornar digital

O DMI-H é apenas a primeira camada de avaliação do seu nível de maturidade digital. Para aquelas instituições que desejam avançar na sua jornada digital, recomenda-se uma avaliação mais detalhada através dos modelos de maturidade da **HIMSS Analytics**. Para isso, entre em contato com a equipe da FOLKS: folks@folks.la.

Relatório Detalhado do DMI-H

Em breve, a equipe da FOLKS enviará um relatório mais detalhado, com benchmarking e outras informações!

Fases de la Transformación Digital en Salud



Índice de Madurez Digital para Salud Digital Maturity Index for Healthcare (DMI-H)

1 a 25%

Tradicional

Aplicaciones no digitales
No hay un plan

26 a 50%

Evolución

Parte son digital
Hay plan de transformación digital

51 a 75%

Sofisticación

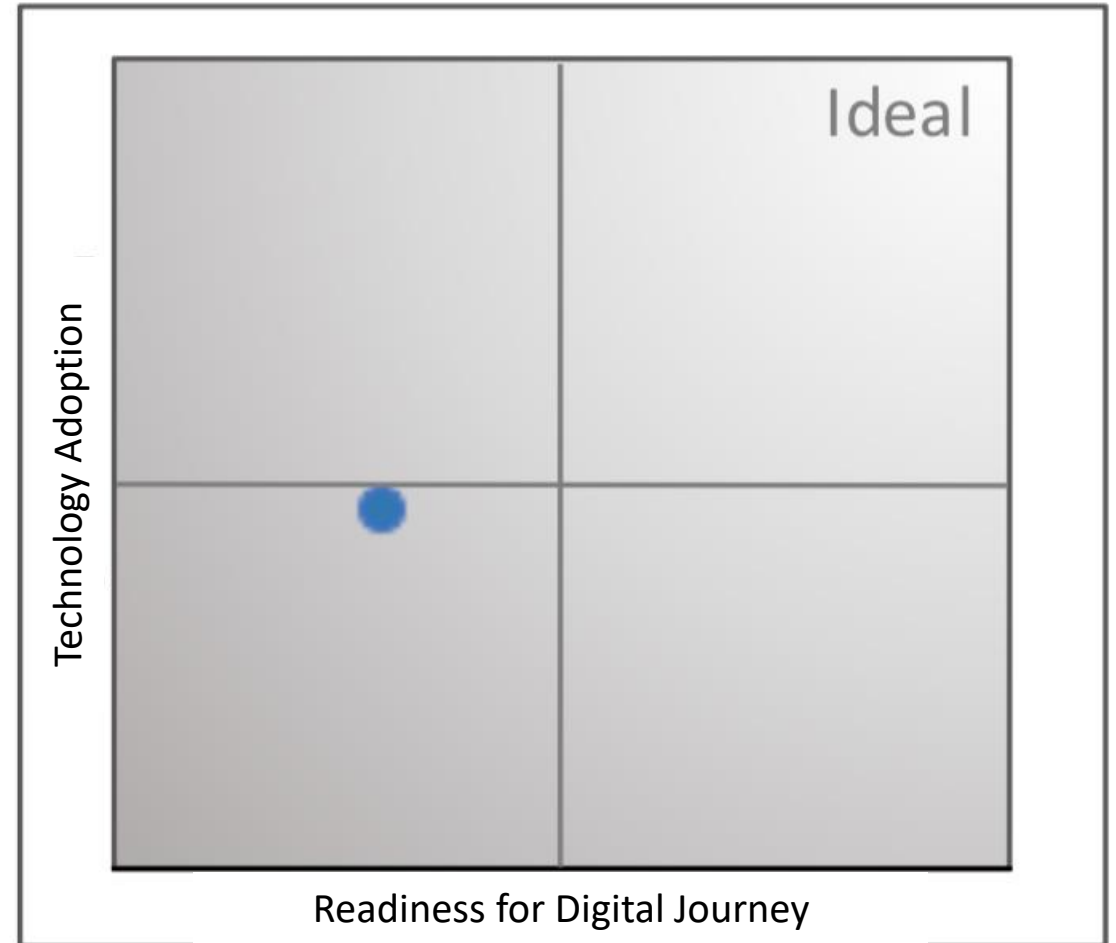
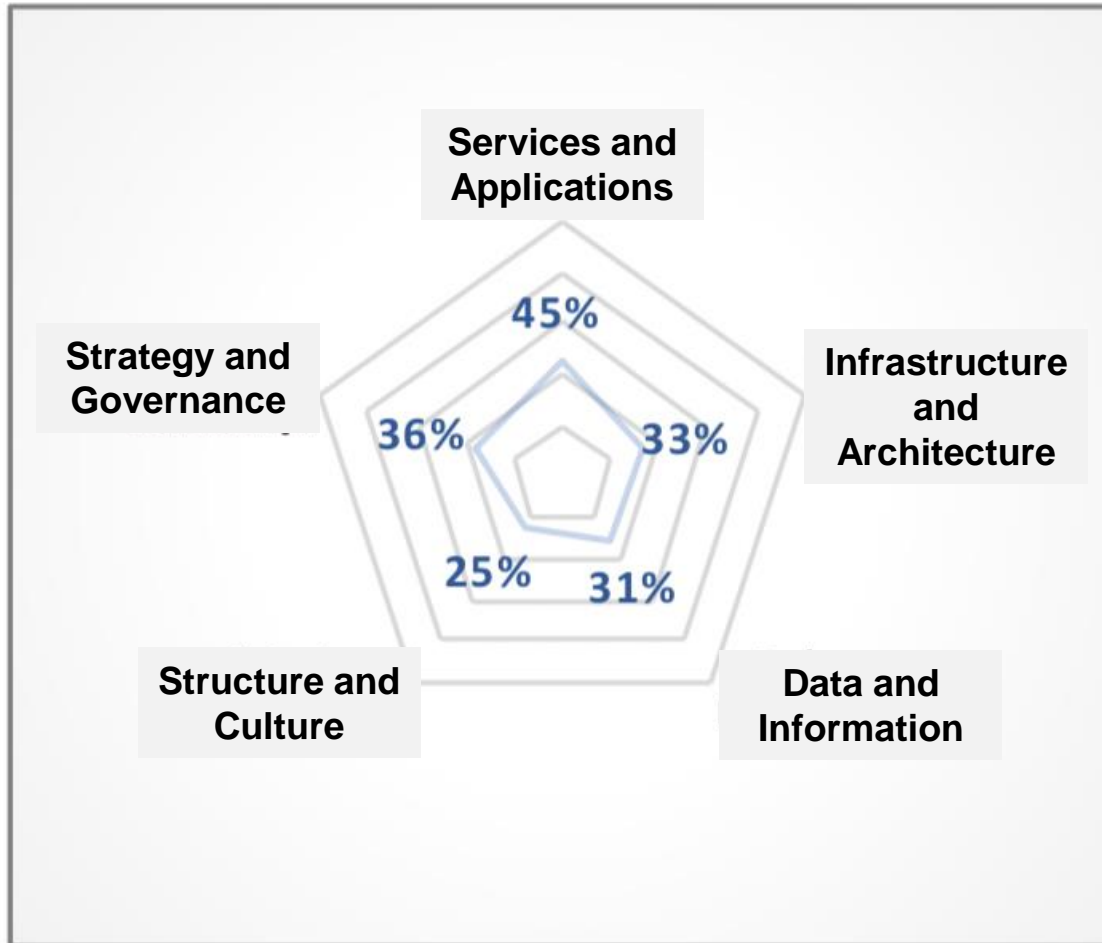
Mayoría son digital
Herramientas y Analytics

76 a 100%

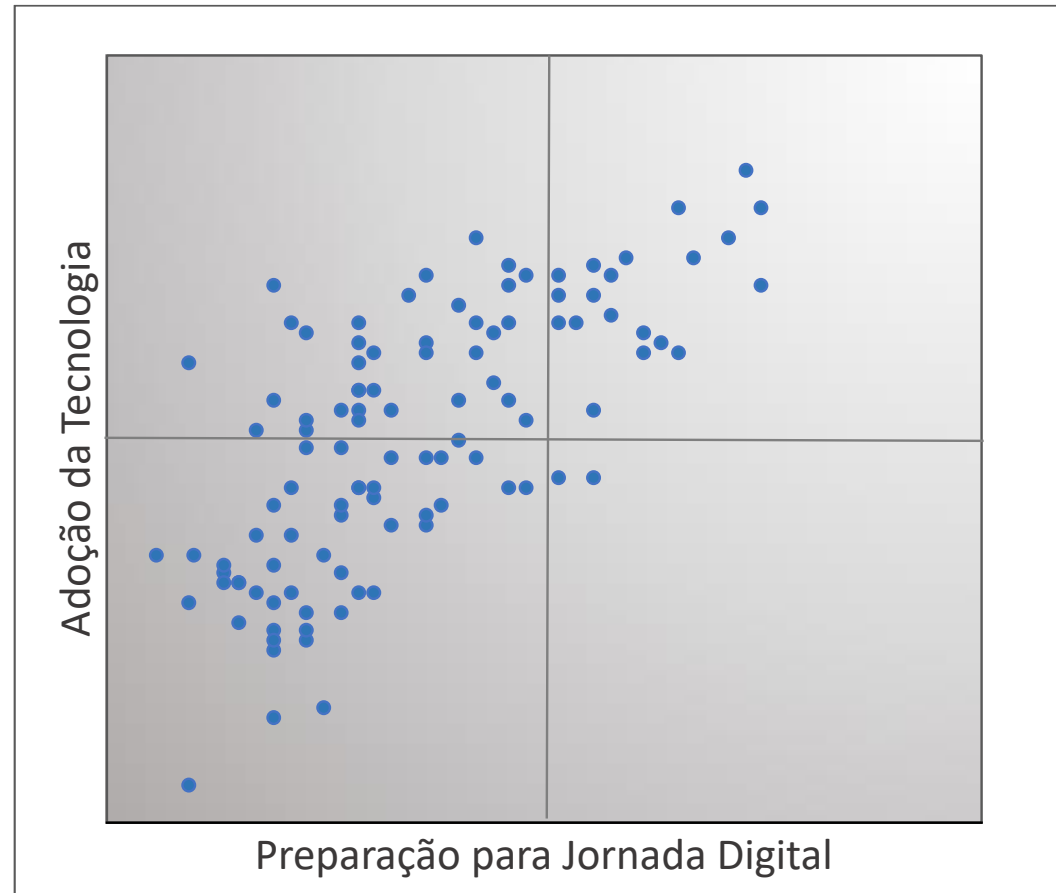
Innovación

Servicios digitales
Nuevos negocios

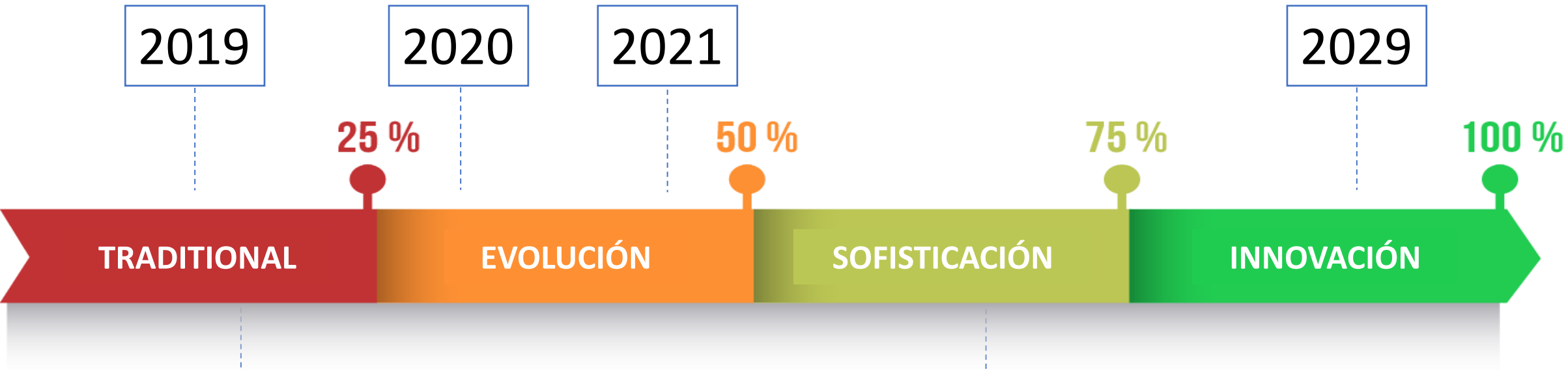
Informe detallado



Madurez Digital en Salud en Brasil



Seguimiento de la Transformación Digital



Framework de la transformación digital en Salud



HIMSS⁵¹

EMRAM HIMSS SOLUTION		EMR Adoption Model 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	

O-EMRAM HIMSS SOLUTION		Outpatient EMR Adoption Model Capabilities
7	Complete EMR; external HIE, data analytics, governance, disaster recovery	
6	Advanced clinical decision support; proactive care management, structured messaging	
5	Personal health record, online tethered patient portal	
4	CPOE, Use of structured data for accessibility in EMR and internal and external sharing of data	
3	Electronic messaging, computers have replaced paper chart, clinical documentation and clinical decision support	
2	Beginning of a CDR with orders and results, computers may be at point-of-care, access to results from outside facilities	
1	Desktop access to clinical information, unstructured data, multiple data sources, intra-office/informal messaging	
0	Paper chart based	

CCMM HIMSS SOLUTION		Continuity of Care Maturity Model Capabilities
7	Knowledge driven engagement for a dynamic, multi-vendor, multi-organizational interconnected healthcare delivery model	
6	Closed loop care coordination across care team members	
5	Community wide patient records using applied information with patient engagement focus	
4	Care coordination based on actionable data using a semantic interoperable patient record	
3	Normalized patient record using structural interoperability	
2	Patient centered clinical data using basic system-to-system exchange	
1	Basic peer-to-peer data exchange	
0	Limited or no e-communication	

AMAM HIMSS SOLUTION		Adoption Model for Analytics Maturity Capabilities
7	Personalized medicine & prescriptive analytics	
6	Clinical risk intervention & predictive analytics	
5	Enhancing quality of care, population health, and understanding the economics of care	
4	Measuring and managing evidence based care, care variability, and waste reduction	
3	Efficient, consistent internal and external report production and agility	
2	Core data warehouse workout: centralized database with an analytics competency center	
1	Foundation building: data aggregation and initial data governance	
0	Fragmented point solutions	

DIAM HIMSS SOLUTION		Digital Imaging Adoption Model Capabilities
7	All three	Stages 5-7 are non-hierarchical and can be adopted in any order: A. Advanced imaging analytics B. Clinical decision support and value-based imaging C. External image exchange and patient engagement
6	Two of three	
5	One of three	
4	Fully integrated image management with efficient enterprise-wide image sharing across different service areas	
3	Imaging governance and strategy; workflow and process safety	
2	Electronic image management covering a variety of images across the enterprise	
1	Electronic image management covering the service area(s)	
0	No or limited electronic image management	

INFRAM HIMSS SOLUTION		Infrastructure Adoption Model Capabilities
7	Adaptive and flexible network control with software defined networking; home-based tele-monitoring; internet/TV on demand	
6	Software defined network automated validation of experience; on-premise enterprise/hybrid cloud application and infrastructure automation	
5	Video on mobile devices; location-based messaging; firewall with advanced malware protection; real-time scanning of hyperlinks in email messages	
4	Multiparty video capabilities; wireless coverage throughout most premises; active/active high availability; remote access VPN	
3	Advanced intrusion prevention system; rack/tower/blade server-based compute architecture; end-to-end QoS; defined public and private cloud strategy	
2	Intrusion detection/prevention; informal security policy; disparate systems centrally managed by multiple network management systems	
1	Static network configurations; fixed switch platform; active/standby failover; LWAP-only single wireless controller; ad-hoc local storage networking; no data center automation	
0	No VPN, intrusion detection/prevention, security policy, data center or compute architecture	

CISOM HIMSS SOLUTION		Clinically Integrated Supply Outcomes Model Capabilities
7	Clinically integrated supply chain achieved enabling precision and personalized healthcare, traceability of care processes, and products used in care linked to patient outcomes to identify the conditions by which best outcomes are achieved for unique population segments	
6	Transparency across patient journey of care supports automated traceability of patient care processes and products used in care; provider teams all linked to individual patient outcomes	
5	Supply chain processes are automated and integrated at the point of care to enable complete traceability of products, care processes, and automated tracking of adverse events and product recalls	
4	Integration of supply chain processes into clinical programs support optimization of inventory management linked to patient care needs	
3	Supply chain strategy creates visibility of inventory across the organization, automates financial processes, and informs product standardization	
2	Inventory tracking and automation focus on optimization of supply costs and inventory management	
1	Basic supply chain processes are established as a business function for the organization	
0	Inventory and supply processes are manual; there is no supply chain strategy identified for the organization	



- 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

Conceptos fundamentales del EMRAM



Historia Clínica Estructurada	Apoyo a la decisión clínica	Paperless	Filmless
Circuito cerrado de productos	Integración	Continuidad del cuidado	Analytics
Gobernanza	Seguridad de la información	Alta disponibilidad	Contingencia

EMRAM 
HIMSS SOLUTION

Latinoamerica



HMC
HOSPITAL
MÁRCIO CUNHA

 HOSPITAL
SANTA PAULA



HOSPITAL ITALIANO
de Buenos Aires



Mirante

Hospital



Hospital
Filantrópico



- 7 Knowledge driven engagement for a dynamic, multi-vendor, multi-organizational interconnected healthcare delivery model
- 6 Closed loop care coordination across care team members
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- 4 Care coordination based on actionable data using a semantic interoperable patient record
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- 2 Patient centered clinical data using basic system-to-system exchange
- 1 Basic peer-to-peer data exchange
- 0 Limited or no e-communication



Experiencias con modelos de Madurez



- IMDES – Brasil
- Turkey – EMRAM
- Costa Rica – EMRAM y O-EMRAM
- New Zealand – EMRAM y CCMM
- Singapore - CCMM

Benefits at Stage 7

At Stage 4 & 5 MDs 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 MD.

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The Danger Zone

ARTICLE OPEN

Evaluating the impact of organisational digital maturity on clinical outcomes in secondary care in England

Guy Martin¹, Jonathan Clarke¹, Felicity Liew², Sonal Arora¹, Dominic King^{1,3}, Paul Aylin² and Ara Darzi¹

All healthcare systems are increasingly reliant on health information technology to support the delivery of high-quality, efficient and safe care. Data on its effectiveness are however limited. We therefore sought to examine the impact of organisational digital maturity on clinical outcomes in secondary care within the English National Health Service. We conducted a retrospective analysis of routinely collected administrative data for 13,105,996 admissions across 136 hospitals in England from 2015 to 2016. Data from the 2016 NHS Clinical Digital Maturity Index were used to characterise organisational digital maturity. A multivariable regression model including 12 institutional covariates was utilised to examine the relationship between one measure of organisational digital maturity and five key clinical outcome measures. There was no significant relationship between organisational digital maturity and risk-adjusted 30-day mortality, 28-day readmission rates or complications of care. In multivariable analysis risk-adjusted long length of stay and harm-free care were significantly related to aspects of organisational digital maturity; digitally mature hospitals may not only deliver more harm-free care episodes but also may have a significantly increased risk of patients experiencing a long length of stay. Organisational digital maturity is to some extent related to selected clinical outcomes in secondary care in England. Digital maturity is, however, also strongly linked to other institutional factors that likely play a greater role in influencing clinical outcomes. There is a need to better understand how health IT impacts care delivery and supports other drivers of hospital quality.

npj Digital Medicine (2019)2:41 ; <https://doi.org/10.1038/s41746-019-0118-9>

Seguridad del paciente



Madurez
Digital

Seguridad
del Paciente

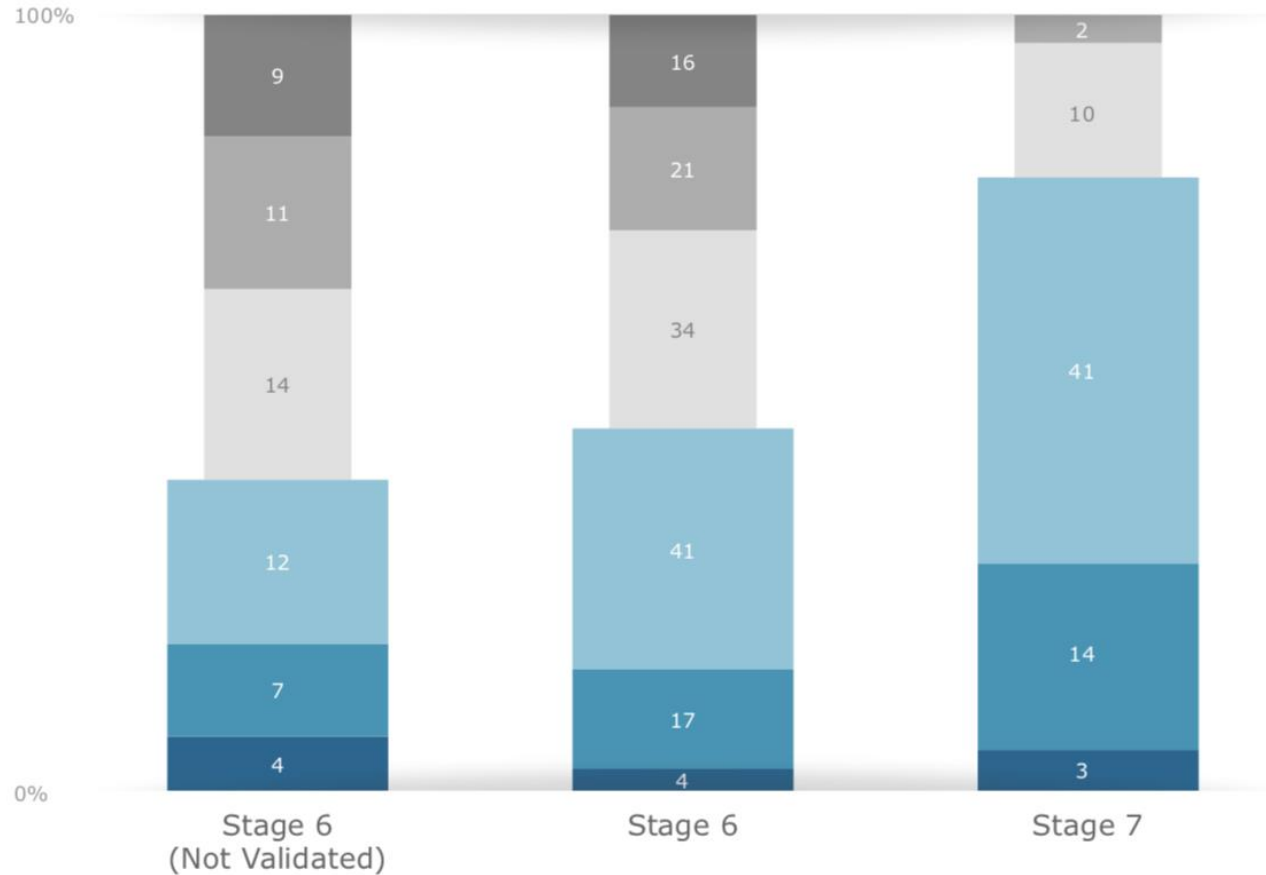
Martin, G., Clarke, J., Liew, F. *et al.* Evaluating the impact of organisational digital maturity on clinical outcomes in secondary care in England. *npj Digit. Med.* 2, 41 (2019) doi:10.1038/s41746-019-0118-9

Physician Satisfaction with EHR

Each observation represents a hospital with 15+ physicians surveyed
(n=248 hospitals; n=23,309 physicians)

- Extremely High (61+ NEES†)
- High (41-60 NEES)
- Above Average (21-40 NEES)
- Below Average (1-20 NEES)
- Low (-20-0 NEES)
- Very Low (Below -20 NEES)

† See next page for definition of NEES



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GRACIAS

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