



International Society for
Telemedicine & eHealth

ISfTeH-Digital Health Capacity Building Working Group

A framework and roadmap for
global digital health workforce
development – Part I

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Image-1: We need to consider the factors mentioned above while developing digitally enabled healthcare workforce development.

Recent advancements in computing and the internet in the new millennium touching every life and helping nations to build digitally-enabled platforms to deal with complexities in healthcare. In the absence of human resources, digital health is not likely to the level of adoption it needs. Hence at ISfTeH we decided to come out with a list of human resources we would need over the next decade for taking digital health at scale. The working group duly acknowledges immense efforts from Prof. Bipin G. Rathod in compiling this exhaustive list. We appreciate our members from across the globe to check this and let us know if we missed something. Please feel free to write to bipin4uk@yahoo.co.uk / rajendra.gupta@isfteh.org.

What is Digital literacy

Digital technology is already integrated into our lives. As technology evolves, we want the health and social care workforce to be fully competent, confident and capable in its use in the workplace (1)

A digitally skilled workforce is a crucial ingredient for organizations undertaking a digital transformation to realize expected benefits in both operational efficiency and customer experience. The most digitally mature companies understand this: they are five times more likely to provide their employees with resources and opportunities to develop their digital skills than those at an early stage.

The Digital Workplace Skills Framework takes as its foundation a broad conceptualization of digital literacy that encompasses technical, cognitive, and socio-emotional skills. Employees, besides operating devices, also need to find and share information, communicate and collaborate, and continuously learn and adapt to achieve tasks, solve problems, be productive, and flourish in the digital workplace.

The focus on digital, technology, and data within healthcare continue to rise. More than ever, there is a significant need to ensure we have a workforce who are both skilled and knowledgeable alongside creating the conditions to ensure individuals can put those skills and knowledge to good use and have the confidence they can progress with a career should they wish to do so

This document focused on ;

- Articulating health informatics career pathways across the globe
- The national-level strategy of recruitment and retention
- Requirements of professional body and understanding digital health network opportunities
- Regional and System approaches to developing a digital health workforce
- Professionalism, Leadership, and culture in digital health
- National level digital health academy

Hospitals

Roles	Major discipline	Minor disciplines	Workforce required	Digital health capacity
Chief Medical Information Officer	Medical	Information management	For every 250 Bedded hospital	Operational level IM/IT/IS/CDSS/Coding Management
Chief Nursing Information Officer	Nursing	Information management	For every 500 Bedded hospital	Operational level IM/IT/IS Management
Chief Digital Health Officer	IT/IS	Medical/Nursing	For every 500 Bedded hospital	Digital transformation
Chief Information Officer	Information system/Information management	Hospital and healthcare	For every 500 Bedded hospital	Strategic & Operational level IM/IT/IS Management. Data Integration Data Management Data Modelling Business Intelligence Business Analytics Advanced Analytics & Data Science Infrastructures & Technologies
Chief clinical Information Officer	Clinician	Clinical informatics	As needed	Clinical information management
Chief clinical governance officer	Clinician	Law, Management		
Chief Clinical Intelligence Officer	Clinician	IS/IM		
Clinical transformation specialist	Clinical informatics	Clinicians/nursing		
Chief Technology and Information Officer	Technology IT/CS/IS	Clinical health information technology	As needed	Clinical technology management
Chief Research	IT / Medical	Research / PhD	Medical Institute	Innovation and

and Innovation Officer				research
Nursing Informatics specialist	Nursing	IT/IM	For every 100 Bedded hospital	Training and implementation management-EMR/HIS
Pharmacy Informatics specialist	Pharmacy	IT/IM	For every 100 Bedded hospital	Training and implementation management-EMAR
Digital Medical Record Officer	Medical record	IT/IM	All hospitals	Digital hospital records
Health Informatics Technician	Medical record	IT/IM	All hospitals	Digital hospital records
Hospital Billing Manager	Finance	Hospital or Health	For every 100 Bedded hospital	Hospital finance
Health insurance and Billing Manager	Insurance	Hospital or Health accountancy	For every 100 Bedded hospital	Hospital finance and accountancy
Pharmacy informatics technician	Pharmacist	IT/CS		
Lead- Virtual health				
Clinical coding auditor	Medical /paramedical			
Clinical Coder	Nursing/Paramedical	IT	For every 100 Bedded hospital	
Tele health Service coordinator	Nursing/Paramedical	IT/IM		
Tele medicine command centre manager	IT/CS	Management	As needed	
Digital and Social Media coordinator	IT/CS	Hospital and health management	For every 500 Bedded hospital	Social media management/Medical tourism
Lead digital patient engagement	nursing/doctor	IT/CS		
Data governance analyst				
Enterprise virtual health-Lead				
Clinical information analyst				

Healthcare

Roles	Major discipline	Minor disciplines	Workforce required	Digital health capacity
Chief Health Information Officer	Public health, Health Informatics	Management IM/IS	Every district levels	Public health data management
Geographic Information system officer	Geography/CS	Health management	State level	
Public Health Informatics officer	Health/Medical Informatics	IT/IM	Every district levels	
Health Insurance manager	Insurance/IT	Health/hospital management	Every district levels	
Chief digital and analytics officer	Analytics and data science	IT/IM	State/regional level	
Monitoring and evaluation officer	Analytics and data science	Healthcare	State/regional level	
Digital health specialist	IT/CS	Health Management	District level	Data and IT management
Population Health data analyst	MPH/Health informatics			
Chief health intelligence officer	Health Informatics/public health	Health information management	State level	Population health, epidemics intelligence
Healthcare digital project manager				
Clinical nurse consultant – digital health	Nursing informatics			
Diseases registry officer	MPH/Health informatics	Enterprise architect		
Health Information manager	Health information management	Health management	Regional level	Health data management

Information Technology companies

Roles	Major discipline	Minor disciplines	Workforce required	Digital health capacity
Business system architect	Computer science /ITechnology/IS	Enterprise architect / management	Nation level	Develop digital health technologies
System architect	Computer science/IT	Hardware technology/system on Chip		Develop health system technology

Core medical IT technologist	Biomedical science/Bio-Medical informatics	IT system developer		Digital health tool and technology development
Medical IoT system Architect	IoT engineering, system engineering	Medical informatics		Clinical informatics technology development
Software and data architect	Software engineering, data engineering			Emr/ehr development
Medical cloud architect development	Cloud engineering	Medical domain		
Interface and interoperability engineering	UI/Ux designing Human computer interfacing	Medical system architect / interoperability standards		
Digital health solution architect	IT/CS/CE	Enterprise architect		
Clinical system architect/engineer	Biomedical engineering			Digitally enabled clinical system development
Business analyst	IT/CS/medical/nursing	MBA/IS		Solution development and implementation
Electronic patient record developer	IT/CS			
Release manager – digital health				
Clinical information assurance officer	Clinical / insurance	IM/IS		
E Health release coordinator				
Automation informatics specialist				
Business change facilitator	Organizational psychology	Management		

Academic and Research

Roles	Major discipline	Minor disciplines	Workforce required	Digital health capacity
Faculty of digital health	Health/Medical informatics	Research	State level	Workforce training and research

Digital health lab and simulation centre head	Digital health architect	Clinical informatics		
Head digital and virtual learning environment	Simulation and 3D realities	Nursing / clinical	Institute level	
Digital health research lab-Head	Informatics research	Core research post doc	National level lab	Core digital health research facility
Head – digital health content development	Media and library science	Digital content		
Instruction design specialist	Art and educational psychology	Digital content		
Chair digital health innovation				
Virtual and hybrid healthcare training	Surgical specialist	Digital content		

Consulting firms and business house

Roles	Major discipline	Minor disciplines	Workforce required	Digital health capacity
Data visualization and storey teller	Data science	Healthcare management		Decision science
Healthcare data scientist	Data science	medical/health		
Health care analyst	Business management	Medical / paramedical		
Healthcare big data analyst	Big data, data science	MBA		
Digital health management consultant	Strategic management	Digital health		
Digital health project coordinator	Project management	Digital health		
Lead digital health data product	Data science	healthcare/medical		
Digital health delivery manager				
Digital health communication strategist				

Intelligence associate-emerging technologies				
Consultant digital health plan				
Digital health platform and capability Lead				
Strategy insight digital connected health				

Pharmaceuticals and Biomedical research

Roles	Major discipline	Minor disciplines	Workforce required	Digital health capacity
Digital health R&D Lead-therapeutics	Biomedical research	Digital medicine		
Digital health manager	Digital health	Biopharmaceuticals		
Digital health product manager	Medical / clinical informatics			
Head innovative health partnership				
Digital health coach-Therapeutics				
Digital health solution strategy & BD				
Digital health analyst				

References:

1. <https://www.hee.nhs.uk/our-work/digital-literacy>
2. <https://digitalworkresearch.com/wp-content/uploads/2018/02/The-Digital-Workplace-Skills-Framework-final.pdf>
3. <https://www.hee.nhs.uk/our-work/building-digital-ready-workforce/health-informatics-career-pathways-project>