

出國報告（出國類別：開會）

出席 2023 年醫療資訊暨管理系統協會
亞太會議

服務機關：臺北榮民總醫院醫學工程部

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出國期間：112 年 9 月 17 日至 21 日

報告日期：112 年 10 月 17 日

摘要

「2023 年醫療資訊暨管理系統協會亞太會議」為亞太地區年度最具影響力數位醫療及資訊技術盛會，象徵全球醫療機構智慧醫療的高品質指標，112 年 9 月 17 日於印尼雅加達召開。來自超過 30 個國家、1000 多名高階智慧醫療之專家到場與會，是醫療保健和技術專業人士最大的聚會之一。會議主軸為創造數位雙生的價值，如何將數位流程貼合臨床流程，達到實踐全人照護連續性、優化病人流與價值流，最後落地成為醫護真正的價值，增加工作的幸福感。為了檢視本院數位醫療發展目標及成熟度，提升數位醫療轉型的完整圖像，定期參與相關國際會議或參與評鑑與國際接軌，可作為醫院未來發展智慧醫療方針重要的方向。

關鍵字：醫療資訊暨管理系統協會 HIMSS, 數位健康指標 DHI , 快捷式醫療照護
互通操作資源 FHIR

目次

| | |
|--------------|----|
| 壹、目的..... | 4 |
| 貳、過程..... | 6 |
| 參、心得及建議..... | 9 |
| 肆、附錄..... | 14 |

壹、目的

日新月異的科技衝擊著醫療臨床場域，如何建立智慧醫院的典範轉移，使醫療達到有時治癒，常常幫助，總是安慰的境界！讓醫護不僅是治療疾病，更帶給病患安慰及溫暖。美國「21世紀法案」，奠定了歐美各國數位醫療法規之發展基礎，定義數位醫療五大內涵包括，行動醫療、健康資訊科技、穿戴式設備、遠端健康與遠距醫療以及個人化醫療。透過數位醫療手法，以資通訊技術運用於醫療照護，突破地理及時間之限制，以使用者為核心，提供趨向個人化的醫療或健康管理服務，並提升醫療資源使用效率及品質。未來，全方位的健康產業將成為主流，傳統醫療照護產業即將走入歷史。

此次參加 2023 年醫療資訊暨管理系統協會亞太會議，其目的為瞭解國外醫療資訊業界最新趨勢並進行未來數位轉型圖像的規劃。智慧醫院是透過先進的資通訊技術，結合醫療改善醫院服務流程與效率。美國醫療資訊暨管理系統協會（Healthcare Information and Management Systems Society，簡稱為 HIMSS）是受理評鑑世界各醫院的智慧醫療高品質指標「數位健康指標」（Digital Health Indicator, DHI）的機構，DHI 著重四大構面的改革力：資訊交互運作能力（Interoperability）、人本掌握的健康照護（Person-Enabled Health）、預測性分析力（Predictive Analytics）及治理能力評估（Governance & Workforce）。而另一個由 Newsweek 以及著名數據資料庫 Statista 公布的世界最佳智慧醫院（World's Best Smart Hospital）則是針對全球醫院的表現衡量三個指標、5 大類別-資訊化、遠距醫療、數位影像、人工智慧和機器人自動化技術等進行評比。由國際智慧醫院的管理、專業人員進行推薦，其次是針對醫院數位技術的實施和使用進行系統性評估，並由首席的資訊人員或管理層進行驗證；最後是對提名醫院進行個案研究，以作為對該醫院的成就驗證。

HIMSS 致力於運用系統性的資訊技術提高醫療水準，在全球健康資訊技術領域開展健康理念、健康教育、健康論壇、市場調查和媒體服務。美國在智慧醫院發展位居全球領先的地位，據統計，美國超過 30%醫療機構已通過 HIMSS EMRAM 評鑑第 6 級有 82 家、第 7 級有 281 家。HIMSS 的評級有非常嚴格的審查標準，根據實現功能的不同可分為 0~7 共八個等級（圖 1）。DHI 是醫院發展以病人為照護中心的創新數位照護模式評鑑指標，考驗數位轉型基礎面向則是進行**整體建設架構成熟度**（Infrastructure Adoption Model, INFRAM）的驗證，而評價電子病歷應用水準模型（Electronic Medical Record Adoption Model, EMRAM）為最多台灣醫院進行的評鑑項目，評鑑指標及流程如下說明：

一、**電子病歷應用水準模型 EMRAM**：HIMSS 的評級有非常嚴格的審查標準，根據實現功能的不同可分為 0~7 共八個等級（圖 1）。0 級表示為尚未完成電子病歷系統，而第 6 等級則為完成全流程醫療資料閉環管理，高級醫療決策支援。HIMSS EMRAM 7 級為其中最高等級評價 - 即是要有完整電子病歷系統，區域醫療資訊共用。截至

目前為止台灣取得 HIMSS EMRAM 6 級醫院有 6 家，7 級有 3 家；林口長庚紀念醫院於 2019 年成為台灣第一家通過 HIMSS 之最高等級第 7 級的醫療機構。通過 HIMSS EMRAM 認證，代表機構對於病歷表單無紙化以及結構化病歷的運用建置水準，表示高度讚賞和肯定。在醫療照護流程中，以資訊協助病人就醫安全，提供病人更為安全的就醫環境，並能不斷地追求卓越，以最先進的資訊安全技術水準，保障病人與家屬獲得最好的醫療服務。

| 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 |

圖 1 HIMSS EMRAM 之醫院評比分級

- 二、**整體建設架構成熟度 INFRAM**：是數位轉型基礎面向的驗證，幫助醫療保健領導者評估和繪製醫療保健基礎設施以及實現其設施基礎設施目標所需的相關技術能力。如果沒有健全的基礎設施，醫療保健組織就無法建立或改善提供優質照護所需的其他能力。如果組織的基礎設施薄弱，他們可能會在數位轉型方面遇到困難。組織可以利用 INFRAM 來改善數位健康的人性化健康和互通性維度。
- 三、**數位醫療指標 DHI**：是醫院發展以病人為照護中心的創新數位照護模式評鑑指標。DHI 衡量四個維度-**資訊交互運作能力**-檢視醫院即時數據無縫銜接健康系統；**人本掌握的健康照護**-檢視醫院以人為本，運用數據成果建構個人化的健康創新照護；**預測性分析力**-檢視醫院能轉化資料為知識，依此建立個人化醫療、預測風險，獲得最佳照護結果，積極優化群體健康成果；**治理和從業人員**-確保醫療隱私、安全、管理和責任，成為永續發展、高績效的數位醫療保健系統。
- 四、其他指標：有考驗醫院數據分析成熟度 Adoption Model for Analytics Maturity (AMAM)，影像應用科技 Digital Imaging Adoption Model (DIAM)、評估照護的連續性 Continuity of Care Maturity Model (CCMM)及社區照護成熟度 Community Care Outcomes Maturity Model (C-COMM)。
- 五、HIMSS 證書給與流程及準則：以評價 EMARM 電子病歷由 8 個階段組成，期望通過技術的運用，實現無紙化環境，提高照護品質，並可以提供醫院和政府機構完全實

現電子病歷的技術路線圖，使實際的醫療服務得到改善，流程所得到的分數是保密的且分析是去識別化的。

六、HIMSS 的導入標準作業程序：醫院的資料蒐集是透過線上調查系統填寫，完成線上資料蒐集後，將進行一個品質審查程序以確保資料之正確性。品質審核完成後會進入現場評審，計算完成後則得到每家醫院的得分。

貳、過程

一、出國行程摘要：

日期：112 年 9 月 17 日至 9 月 21 日

| 日期/時間 | 行程內容 |
|----------|--|
| 9 月 17 日 | 臺灣 → 印尼雅加達 |
| 9 月 18 日 | CIO Workshop 8:30-17:30 |
| 9 月 19 日 | Opening Address & Progress of Digital Health Transformation by HIMSS23 APAC Chairperson Keynote Plenary 1: Health that Connects, Tech that Cares Keynote Plenary 2: Building National EMRs Keynote Plenary 3: Digital Twin Enables Healthcare Success Keynote Plenary 4: How the FHIR Interoperability Standard Can Turbo-Charge Your Digital Maturity Keynote Plenary 5: Human Digital Twin: Improving Health of Our Patients and Employees Keynote Plenary 6: Panel Discussion — Meeting the Challenge of Value-Based Care Closing Keynote Plenary 7 — A New Era for Medicine: Digital Diagnostics and Therapeutics HIMSS APAC Awards Dinner (By invitation) |
| 9 月 20 日 | Keynote Plenary 8: Building a Digital Hospital — Cleveland Clinic Story in Abu Dhabi & London Keynote Plenary 9: Survival of the Digitalist: How Organizations Around the World are Transforming with Tech that Cares Keynote Plenary 10: Revolutionizing Patient-Centric Communication with Zoom Contact Center Keynote Plenary 11: Advancing Healthcare with Generative AI Keynote Plenary 12: Panel Discussion — The Double-Edged Sword of Emerging Technology Keynote Plenary 13: The NUHS Journey - Creating an Integrated Ecosystem Closing Keynote 14: Panel Discussion — The Next Wave in |

| | |
|----------|------------|
| | Care |
| 9 月 21 日 | 印尼雅加達 → 臺灣 |

二、會議重點摘要：

(一)資訊長訓練營

在數位時代，資訊長 (CIO) 的角色已不斷擴展，遠遠超出了管理技術基礎設施的範圍。CIO 是推動數位化的核心轉型，以確保醫療機構可以善用科技來改進病患照護、簡化營運並實現策略目標。CIO 不僅需要掌管組織資訊軟體技能發展，更要有效進行領導溝通，並組織機構資訊計畫與組織目標的策略一致性。智慧醫院是透過先進的資通訊技術，改善醫院服務流程與效率。在會議中精心設計各種腦力激盪的對話激發關鍵思考，並透過務實見解產生支持發展決策的同理心。

1. 數位醫療過程瓶頸：

數位醫療過程常忽略界定所有利益關係人的權利義務，包含哪些是服務受益者、服務提供者、資源提供者、服務仲介者及品管監督者，因此在發展智慧醫時易遇到瓶頸。目前醫院在數位轉型過程中最大的難題是溝通，每位醫師都是獨立自主的，如何能從獨立移動到相互依存，是在數位轉型與智能轉型過程中非常大的課題。

2. 團隊資源的戰略合用：

關鍵是數位雙生，創造數位流程。以數位流程貼合實際臨床流程，利用數據分析來進行情境模擬與預測。如過往進行內視鏡微創手術執行時，需抬頭注視不同螢幕之內視鏡與斷層 2D 影像，並與 3D 模型中內視鏡位置比對，相當不便且易提高手術風險。數位雙生即將患部的電腦斷層掃描資料匯出，利用人工智慧(AI)建置軟/硬組織之數位雙生資料，搭配混合實境開發技術，將導航電腦利用無線傳輸方式，串聯至智慧眼鏡，達到動態追蹤系統精準定位相關手術器材，提供虛實整合導航功能。

3. 基於協議的作業規範：

如近年數位醫療廠商開發病患照護設備，常因未充分掌握標準，使得設備只能侷限在單一場域應用，很難去做跨場域或大廣度的推展。並且在產品開發常缺乏全方位設計考量，反而加重臨床人員負擔。建議應該善用品管、資訊與研創三大思維來進行思考，讓人因工程融入三大思維，讓智慧醫療有機會從難以實現的美夢廣接地氣，卓然而成典範移轉。

4. 數位轉型領導者的思維素養：

有效的策略規劃和溝通是成功的基石。CIO 和智慧醫院的領導者，應該善於制定靈活的策略路線圖，提供清晰度、方向、以適應快速發展的數位時代。有效的溝通不只是簡單的訊息傳遞，更是激發和影響團隊動力。領導者需能夠清晰表達充滿目標的願景，激勵團隊成員；不僅精通技術，而且善於向所有利害關係人傳達數位轉型的願景和好處。

5. 智慧醫院明確的指揮系統原則：實踐全人照護連續性，優化病人流與價值流，將儲備價值落地成為醫護真正的價值，增加工作的幸福感。

(二)會議第二個重點為「快捷式醫療照護互通操作資源」(Fast Healthcare Interoperability Resource; FHIR)：

"FHIR is not a Choice! It is a Necessity"全球的醫療機構需儘快落實使用 FHIR 為數據的交換標準，貫穿整個會議的主軸。FHIR 是一種用於交換醫療保健資訊的標準。透過標準化的事件(event)和訂閱機制(subscription)實現醫療資訊的即時共享，有助於提高臨床工作效率、促進醫療機構之間的資訊互通，以觸發臨床決策支援系統隨選。FHIR 正在改變目前智慧醫院的流程，如在智能藥事數位流程中，即時藥物庫存更新、藥物用量警示、改善藥物分發流程、預防藥物過期、遠程監控與支持。當醫生開處方時可以即時通知藥劑師，當藥品庫存發生變化時，FHIRcast 可以同步更新 EHR 系統中的庫存資訊，讓醫生和護士隨時掌握藥品的庫存狀況，以便制定更合適的治療計劃。

FHIR 運用於護理多個環節的協同工作，如病人護理、用藥管理、檢驗結果查看等。以病患轉科的案例，需要同步更新病人的相關資訊。轉入科室的護理師應該能立即查看患者的病歷，而轉出科室的護理師則不再需要這些資訊。為了確保護理過程的順利進行，護理團隊應該及時了解患者的最新狀況。當醫療機構針對需要長期或持續監測的患者，提供遠程監護。可透過 FHIR，醫療機構可以即時查看遠程患者的生理指標，並及時對病情變化作出響應。

目前全球已有 50 多國採用 FHIR 作為主流交換標準，且預估至 2023 年底，全球 60%的醫療機構都會使用 FHIR。台灣在醫院病歷電子化發展多年 HIS 系統，面臨系統架構參差不齊整合困難、管理難度非常高並且難以修改，控制變數多導致需要投入大量人力維護。臺灣電子病歷和醫療影像目前還沒有統一的交換標準，仍在使用 2005 年所推出的臨床文件架構，導致只能讀取臨床文件、可互動性低，且無法與行動化醫療所需的輕便裝置串聯。從 HIMSS 的不同的小組討論此建議各國政府，可以不同的手腕(經濟誘因以及行政手段)來推動次世代改革。其次是推動 FHIR 為交換數據標準，讓 HIS 系統開放才可以使各醫療院所的數據可以互通，臺灣機構設施設計架構需積極改變才能與國際接軌。

(三) Keynote Plenary 會議重點

明日醫療已經是無法單靠獨善其身來打造醫療生態圈，而需結合不同領域專家的集體智慧，以生態跨域創新策略，針對服務、管理、建築、研究及科技五大面向進行典範轉移，才能真正打造出屬於台灣醫療全新的未來。智慧醫院的簡單定義關鍵就是「智慧元件」，包括機器學習、電腦視覺、自然語言分析及機器程序的自動化等四大功能。一個智慧元件會有一個到多個的技術和功能，但是必須同時達到以下四種用途：更好

的醫療照護、更好的體驗、更好的操作效能以及最重要的減輕員工壓力。這個概念重要但非常難達成，因此常常發生醫護過勞的情況，尤其是在新冠疫情期間，這樣的狀況更為嚴重，因此如何去運用智慧元件來達到這四個用途，應是大家努力的方向。讓數位醫療真正走向智慧醫療，5G+AIoT 是一個重要關鍵。



圖 2 Keynote Plenary 會議

參、心得及建議

HIMSS 是受理評鑑世界各醫院的智慧醫療高品質指標數位健康指標的機構，代表醫院是發展病人為照護中心的創新數位照護模式。HIMSS23 APAC 會議為亞太國家智慧醫療資訊及數位發展趨勢的武林大會，韓國三星醫療中心(SMC) 為全球第一家達到 7 級 INFRAM 及 DHI 最高等級認證的醫療機構；林口長庚紀念醫院為臺灣榮獲 DHI 評鑑全球第二名殊榮；中國醫藥大學附設醫院雖列 DHI 評鑑全球第三名，但獲得另一座國際

智慧醫療頂尖大獎-戴維斯卓越獎(HIMSS Davies Award of Excellence)。我們可以感受到全世界的智慧醫療機構都聯繫起來，致力運用多元數位工具來管理病人，提供病人更創新與優化的醫療照護環境。更值得一提的是，目前國際採用的主流交換標準為 FHIR 作為主流交換標準。目前全球已有 50 多國採用 FHIR，且預估至 2023 年底全球 60%的醫療機構都會使用 FHIR。我國及本院應強化共通性 FHIR 欄位格式編碼標準之建置系統及整合，除了符合國際趨勢，對於公衛研究、醫療資源、醫療品質都有相當大之助益。

臺北榮總總院為榮院體系的領頭羊，更直接領導北榮分院一同走向醫療數位轉型服務歷程。數位醫療的成功，端賴所有具備熱情、專業與願景的夥伴合作，並且善用有效公私協力合作關係，確實認知智慧醫院的三層架構(賦能基礎、槓桿策略、期待成果)，來形成智慧環境、建造智慧機構、培養智慧醫護，從而提高所有病人的健康識能成為智慧病人。未來，以病家為中心、以醫護為核心、以科技為重心，朝向醫院微型化、醫院虛擬化及醫療高效化。創建有不到診間的門診，沒有病床的床位、雙向共編的病歷、客製的健康理專，在宅遠距的照護。讓醫療生態圈創造出零焦慮、零等待、零過勞、零失誤及零風險。

本次參與 HIMSS 「2023 年醫療資訊暨管理系統協會亞太會議」有三個反思感想：
(一)對醫院組織的反思：

數位醫療轉型的圖像是以精實為心、智慧為體的決戰場域。定期參與相關國際會議或參與評鑑與國際接軌，作為醫院未來發展智慧醫療方針重要的方向有其必要性。2024 年 World's Best Smart Hospitals 2024 最新評比成果，除了去年唯一入榜的台中榮民總醫院(第 246 名)外，中國醫藥大學附設醫院已躍升至第 301 名，甚至超越臺大醫院(第 313 名)、台北榮民總醫院(第 320 名)。在智慧醫療轉型的路程上，我們真的需要進行真誠的反思，檢視醫院在轉型的過程，避免片段零星的修補行動「頭痛醫頭、腳痛醫腳」，而是找出病源以透明、可視化和當責進行全盤性改造。本次會議，歸納出以下提供醫院參考：

1. **知道想要達到什麼**：具有企圖心的醫院很清楚為何要進行數位轉型。為了使財務報表有更亮麗的表現，內部員工能落實精實管理、簡化流程，讓病患有更好的醫療品質及有效治療效果，許多醫院開始使用 AI 技術來改善流程速度、降低營運成本，不論原因是什麼，都要定義一個總目標，來作為採用 AI 的指導原則。
2. **與伙伴組成的生態系統合作**：建構智慧醫院需要許多醫資新創公司的合作伙伴才能在智慧醫療發展的取得成功。醫療機構與醫資新創公司在合作過程中需要平衡彼此的利益，透過積極的溝通和協商，確保雙方獲得公平的回報。醫療機構可以分享其病患數據，以幫助新創公司開發更好的醫療軟件；而新創公司則可以提供技術支持，幫助醫療機構提高運營效率。

以往與 ASUS AICS 公司研發中心開發 AI 服務的智慧醫療資訊平台的經驗

為例，首先是要讓合作伙伴能融入並參與醫療場景，發現醫師在臨床上的困境（須在各自獨立的系統的畫面不停切換，查看病人的資料開出正確的醫囑單），並建立信任和透明度後，才能在各自專長的領域進行系統開發；今年 7 月，ECRI 總裁 Marcus 至本院進行廣泛的意見交流，特別是在醫療照護警訊、醫療設備管理相關的議題上。在 11 月我們即將就雙方各自深厚優勢萌發雙方互利的合作意向，在醫療器材上市後表現-如不良警示、設備價格、設備規格、維修、保養、醫療照護技術等進行議題合作。在未來我們應持續與各國的國際伙伴，組成數位雙生的生態系統進行合作。但合作過程中的情況可能會不斷變化，雙方應具備靈活性，以適應變化並應對新的挑戰。

3. **致力使用數據和分析：**數據是機器學習成功的基礎，如果缺乏大量好的數據模型便無法做出正確的預測模型。檢視我們以往在醫院開發電腦輔助偵測 CADe、診斷 CADx，需要收集更多數量質量兼具的醫學影像，需要專業的臨床醫生協助清理、分類和標記近十萬張醫學影像，這些 AI 的開發工作，相較工業界及學術界單純的資料來得困難及辛苦；再以目前醫療器材電子化病歷軟體開發的案例，林副院長帶領團隊視導北區各新竹、桃園、蘇澳、員山、玉里、鳳林、臺東··等分院，發現在資源、人力及醫療器材的困境，後續再視各分院的特色及需求進行客製化修改以精進北區各分院之醫療設備管理，提升醫療服務品質。未來也可與分院共同參與 HIMSS 社區照護成熟度 Community Care Outcomes Maturity Model (C-COMM) 評核，達到另外一個層次的雙贏成長。

4. **整合智慧醫療元素至工作流程：**

美國有些政府機構找到一些很適合 AI 的具體任務與工作流程，如在新冠疫情初期，美國退伍軍人部設置 AI 聊天機器人來回答問題、協助確認確診的嚴重程度，並尋找患者可以入院的地點。在未來無論是與新創公司開發的 AI、資訊室與醫療科部合作所開發出的軟體，甚至提供 3D 列印服務，支援創新實體化，研發教具、零組件以符合臨床單位業務需求，都是將智慧醫療元素整合到目前的工作流程的應用。但我們必須要慎重選題，不要試圖將 AI 放入無法從機器的速度和規模獲益的工作流——如那些很少使用、不涉及、不會產生大量數據和重覆性的流程中。高層主管必須對這些投入院方資源的 AI 流程，有敏銳且有實地的了解，並兼顧第一線員工視角來進行考量。

在「AI 隨處可見」克里夫蘭醫學中心(Cleveland Clinic)，資訊管理執行總監 Chris Donovan 表示：在 AI 轉型的初期，團隊遇到許多困難。醫院所擁有的大數據，經常以不同的方式擷取，甚致有不同的定義，且絕大多數都不是經過清理、結構良好的數據，所以造成數據分析巨大挑戰。即使像血壓這種常見的指標，也可能在病患站著、坐著、臥著時進行量測，並以不同方式進行紀錄。所以，必須了解每種實務做法的數據結構，才能正確解讀血壓數據。

領導人面臨最大的挑戰是文化的建立—強調依數據作成決策，引導員工創建 AI 治理，並對於這些改善充滿熱忱。所以由熟悉 IT 的執行長來領導 AI 行動方案，會有助於數據驅動決策的文化凝聚，並促進整個醫院或組織的創新。

(二) 對組織成員的反思：

目前國內醫院機構最常進行的為：EMRAM 驗證，來檢視醫院電子病歷系統數位發展的成熟度； INFRAM 驗證，來考驗醫院數位建設的整體架構成熟度。首先為重生醫療科技基礎架構，由傳統的資訊科技基礎建設走向雲原生架構。其次是改變機構設施的設計底層架構整合醫療數據規格，最後為資訊基礎架構與運營規劃及資訊管理。

在本次會議中有許多同行台灣醫院機構參與 HMISS 評鑑-長庚醫院、中國附醫、台南市立醫院..。公布本次獲亞洲 2023 HIMSS 戴維斯卓越獎，中醫大附醫以三大智慧醫療平台「智抗菌平台 i.A.M.S」、「遠距 AMI 平台」以及「智慧肺護守 ARDiTeX」成果，拯救更多重症病人的生命，受到高度肯定，成為台灣唯一獲獎的醫院。戴維斯卓越獎是以智慧醫療改善病患健康之傑出成果作為全球醫院學習標竿而設立，曾獲得該殊榮的頂尖醫學中心有克里夫蘭診所 (Cleveland Clinic) 和美國加州大學洛杉磯分校健康照護體系 (UCLA Health) 等國際知名醫院。

台中榮民總醫院是唯一參加 HIMSS 的公立醫院，特別請教參與會議的資訊長，有關參與 HIMSS 的心法及感想：雖然在期初智慧醫療系統可能存在一些初期成本，但長期上利用數據分析、加強管控，使得行政流程效率提升，減少病患再次住院率、更積極的預防性護理來協助降低醫療成本，而這些潛在的長期節省可能超過期初成本。我們透過參與 HIMSS 的活動，能更了解我們在發展智慧醫療還欠缺那些拼圖。從傳統醫院化身為智慧醫院，營運中心需要有最好的決策協助醫院進行效率管理，資源運用極大化、浪費極小化，藉由卓越的營運來加速病人照護流程，人力管理、採購簡化、服務優化。而評核過程的案例都是我們參加 SNQ「國家品質標章·國家生技醫療品質獎」，參加 HMISS 評鑑只是，透過資訊、品管、護理、放射..各臨床部門及行政團隊的合作整理這些案例，也讓我們能更有向心力。

(三) 個人的影響反思：

在會議中，全球智慧醫院翹楚展現許多新穎的科技、百種智慧醫療的創新於臨床應用，但如何進行數位轉型專案落地，才是最難的關卡。雖然科技無疑是智慧醫療的重要組成部份，但它並不是唯一存在的元素，還涉及利用數據、分析和洞察改善預後；運用破局思維透視碳中和與智慧醫療介紹智慧醫療法規生態模式、智財保護及運用醫療大數據的倫理考量。

數字醫療並不是用來取代醫療服務提供者，相反的，它的目的通過提供更便捷、高效的方式來管理健康，並惠及各個年齡段的患者，特別是老年族群。新型態的遠距醫療可以減少往返醫院的舟車勞頓，而在藥物管理也會更貼合醫療遵循。科

技得進步太快，今天的驚豔是明天的 Me too，我們在建構智慧醫院時需掌握初心，時時檢視，Why 為什麼要做、How 如何做、What 該做那些事，我們所做的這些事是否能真正幫忙我們的醫護。因此，應把握創新科技的發展機會，包括服務創新、流程創新和產品創新，但最重要的。我們應掌握時勢，發展虛實整合的連續空間。

現在，即使是一千種算法也不能取代醫生。當機器可以看見時，醫生將多一雙不知疲倦的眼睛來幫助他們診斷和照顧病人。更密切的醫患關係不僅給予患者所需的關注，也撫慰他們的心靈。

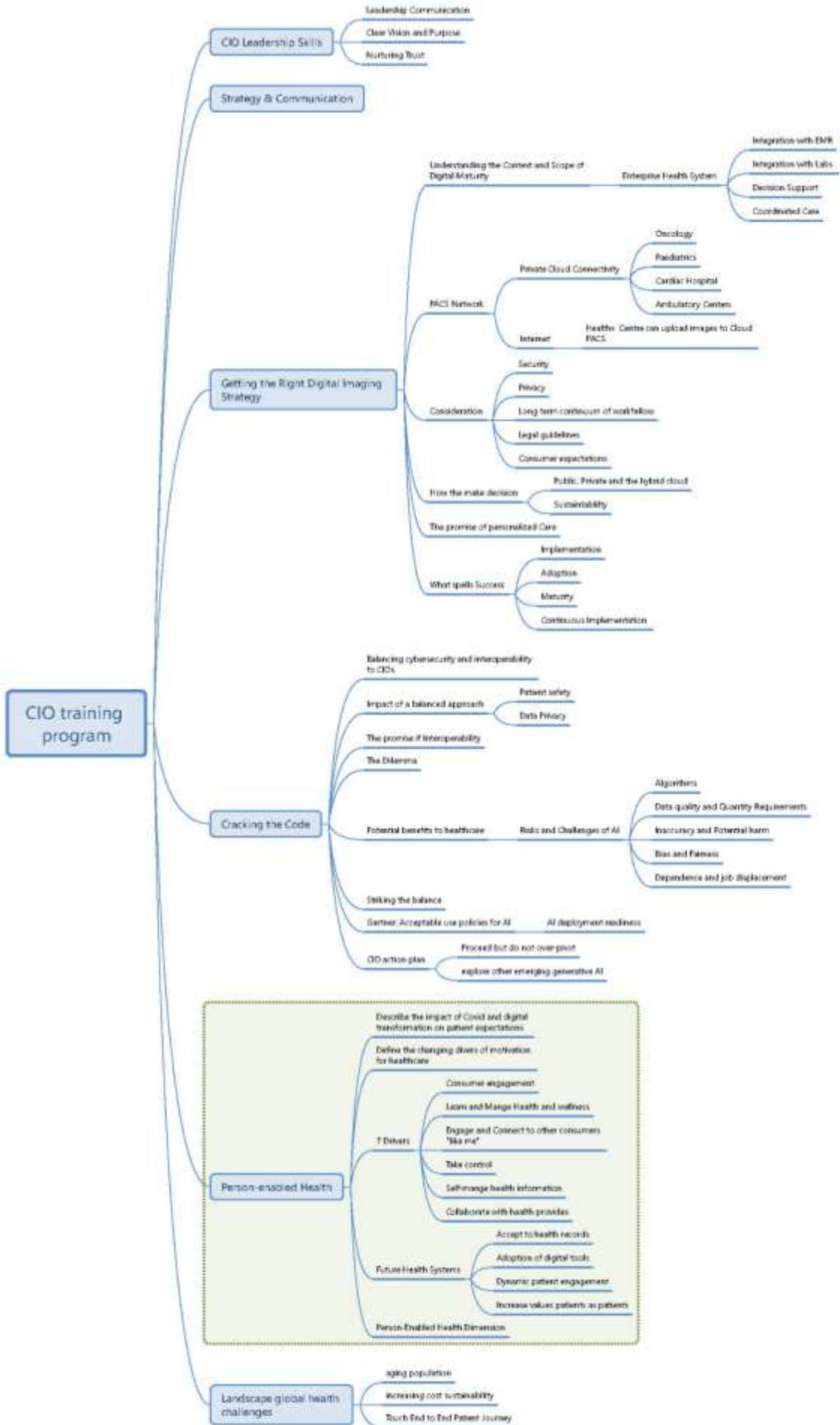
肆、附錄



圖 3 HIMSS23 APAC 會議台灣智慧醫院參與的代表

機構資訊長 CIO 訓練營-互動內容及花絮

1. 團隊資源的戰略合用：關鍵是數位雙生，創造數位流程，以數位流程貼合實際臨床流程，利用數據分析來進行情境模擬與預測。
2. 基於協議的作業規範：建立標準作業流程，提高工作的可靠度，降低不確定變異。
3. 功能導向的戰情中心：以高維度的數位儀表板，提供自動圖形化指標，來呈現跨科部的即時數據。
4. 運算邏輯預測性分析：商化智慧分析最重要的元素，即讓數據變為證據，把證據化身為儲備價值。
5. 明確的指揮系統原則：實踐全人照護連續性，優化病人流與價值流，將儲備價值落地成為醫護真正的價值，增加工作的幸福感。





2023 APAC Health CIO Report

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This report presents comprehensive insights and takeaways from the 2023 HIMSS APAC Health CIO Workshop, a pivotal event held in Jakarta, Indonesia. The Workshop brought together healthcare leaders to explore the multifaceted role of Chief Information Officers (CIOs) and their pivotal role in driving digital transformation in healthcare. Topics covered ranged from strategic alignment to cybersecurity, offering valuable lessons for healthcare executives and leaders.



Table of contents

- 3 Introduction**
- 4 Shared Experiences and Learning**
- 5 Strategy and Communication**
- 6 Building Networks, Community, and Teams**
- 7 Technological Advancements and Innovation**
- 8 Data-Driven Healthcare**
- 9 Patient-Centric Care**
- 10 Cracking the Code & Balancing Cybersecurity and Interoperability for CIOs**
- 12 Driving Digital Transformation in Healthcare**
- 14 Conclusion**





Introduction

In today's healthcare landscape, the role of Chief Information Officers (CIOs) extends far beyond managing technology infrastructure. CIOs are at the heart of driving digital transformation, ensuring that healthcare organizations leverage technology to improve patient care, streamline operations, and achieve strategic goals. The 2023 HIMSS APAC Health CIO Workshop, held on 18 September 2023, in Jakarta, Indonesia, served as a pivotal platform for CIOs to come together and share their experiences, strategies, and insights.

The Workshop encompassed a diverse range of topics, reflecting the multifaceted nature of the CIO role. From soft skills development and effective leadership communication to the strategic alignment of IT initiatives with organizational goals, the discussions were enriched by the presence of esteemed experts and thought leaders. Collated by Tamara Sunbul, MD, MBA, FHIMS, CPHIMS, PMP; Edward Marx, CEO, Marx Advisory, USA; and Gareth Sherlock, CEO, Turimetta Consulting, this report delves into the shared learning points that emerged from the interactions at the conference.



Shared Experiences and Learning

The Workshop accentuated the potent synergy derived from shared experiences and collective learning. Traditionally celebrated for their technological acumen, CIOs voiced the importance of fostering open dialogues and constructive knowledge exchange. Thought-provoking discussions and meticulously designed brainstorming sessions galvanized critical thinking and ignited the sharing of pragmatic insights. This collaborative approach galvanizes innovation and underpins judicious decision-making.

This section underscores that the healthcare industry's metamorphosis is profoundly enriched by a culture of perpetual learning and cooperative ideation. By encouraging professionals to bring their unique experiences and insights to the fore, healthcare organizations can adeptly navigate the tempestuous currents of technological change.





Strategy and Communication

Effective strategic planning and communication are the cornerstones of successful healthcare transformation. In the context of digital transformation, these aspects take on a heightened significance.



Strategic Alignment

The Workshop emphasized that any healthcare organization embarking on a digital transformation journey must ensure that its IT initiatives align seamlessly with broader organizational goals. It's not merely about implementing the latest technologies; it's about using those technologies to fulfill the organization's mission. CIOs and healthcare leaders should be adept at crafting flexible strategic roadmaps that provide clarity, direction, and the ability to adapt to rapidly evolving technological landscapes.



Communication as Leadership

Leadership communication emerged as a central theme. Effective communication goes beyond the simple transmission of information; it's the crucible for inspiring and influencing team dynamics. Leaders who can articulate a clear vision imbued with purpose can galvanize team members and propel them toward shared objectives. The Workshop highlighted the importance of leaders who are not only tech-savvy but also adept at conveying the vision and benefits of digital transformation to all stakeholders, from frontline staff to board members.



Change Management

Managing change effectively within healthcare organizations is paramount. This involves recognizing that digital transformation is not just about adopting new tools; it's often a fundamental shift in how healthcare is delivered. It requires sensitivity to the concerns and anxieties of staff who may be accustomed to traditional processes. Change management strategies that emphasize transparency, education, and involvement of all stakeholders are essential for a smooth transition.



Building Networks, Community, and Teams

Organizational culture and engagement are foundational for nurturing high-performance teams and fostering innovation.



The Virtues of Culture

The Workshop reinforced the idea that organizational culture plays a pivotal role in employee satisfaction and productivity. It was pointed out that Aristotle's 7 Virtues, particularly gratitude, form the bedrock of a positive workplace culture. Leaders in healthcare should prioritize these virtues and create an environment where employees feel valued and appreciated. When employees are content and engaged, they are more likely to collaborate effectively and contribute to the organization's success.



High-Performing Teams

To build high-performing teams, CIOs and healthcare leaders should focus on character-driven recruitment. Beyond technical skills, it's essential to identify team members who exhibit traits like trustworthiness, adaptability, and a commitment to the organization's mission. Addressing team dynamics, fostering trust, and providing stability are essential elements in team building. Additionally, leaders should empower staff to collaborate across disciplines and work with other teams. This interdisciplinary collaboration is often where innovation thrives.



Community and Networks

The Workshop highlighted the significance of creating networks and communities, both within and beyond healthcare organizations. Networking serves as the crucible for forging valuable partnerships, sharing best practices, and staying informed about industry trends. Building a supportive healthcare community can amplify the impact of digital transformation efforts, fostering collaboration among organizations and individuals passionate about enhancing healthcare delivery.





Technological Advancements and Innovation: Setting the Right Infrastructure



Technological Landscape

The healthcare sector is continually evolving, driven by rapid technological advancements. The adoption of 5G technology was recognized as a game-changer in telemedicine and remote patient monitoring. Furthermore, the potential of blockchain in enhancing data security and interoperability garnered significant attention.



Application

Modernizing healthcare infrastructure is a necessity in the digital age. Software-Defined Networking (SDN) and the INFRAM checklist play pivotal roles in healthcare standardization and infrastructure enhancement. By configuring SDN as an integrated network, healthcare organizations can connect information seamlessly, reduce costs, and provide intelligent services. Case studies showcased the benefits of advanced wireless infrastructure like WiFi 6 and 5G. These technologies enable the development of autonomous ward rounds robots and support real-time transmission of large-capacity medical images, enhancing patient care and operational efficiency.

The importance of setting the right infrastructure cannot be overstated in healthcare's digital transformation journey.



The Role of AI and Machine Learning

AI and ML are poised to revolutionize healthcare. Various applications, from predictive analytics for disease management to natural language processing for improved patient interactions, were discussed. Ensuring that AI systems are trained on diverse datasets to mitigate bias is crucial.



Telemedicine and Remote Monitoring

The COVID-19 pandemic catalyzed the widespread adoption of telemedicine. Healthcare organizations must invest in robust telemedicine infrastructure. Additionally, remote monitoring solutions offer valuable insights into patient health and are poised to become standard in chronic disease management.



Data-Driven Healthcare



The Power of Data

Data is the lifeblood of modern healthcare, and harnessing its potential is imperative. It's crucial to invest in data governance and ensure data quality, security, and compliance.



Interoperability Challenges

Achieving seamless data exchange between disparate systems remains a challenge. The Workshop emphasized the need for standardized data formats and interoperability frameworks.



Ethics in Data Utilization

Patient consent, data privacy, and the responsible use of AI in diagnostics were hot topics. Healthcare leaders should establish ethical guidelines for AI and data-driven technologies.

Electronic Medical Records (EMR) are integral to modern healthcare, and the HIMSS EMR Adoption Model provides a structured approach for healthcare organizations to assess their digital health maturity. The Workshop highlighted the importance of establishing a cross-functional digital transformation team and assessing the current digital capabilities of the hospital.

Training staff on digital tools and technologies and implementing data governance policies were identified as critical steps. Continuous monitoring and evaluation of digital transformation progress ensure that healthcare organizations leverage EMR to its fullest potential.

Structured EMR enhances patient care by enabling close-loop, structured data, and AI integration.



Patient-Centric Care



Patient Engagement

Engaging patients in their healthcare journeys empowers them and leads to better health outcomes. Digital tools like patient portals and mobile apps enable patients to access their health records conveniently.



Personalized Medicine

Advances in genomics and AI enable personalized treatment plans. This marks a shift from a one-size-fits-all approach to healthcare.



Value-Based Care

Healthcare is moving away from fee-for-service models towards value-based care, rewarding healthcare providers for positive patient outcomes.





Cracking the Code & Balancing Cybersecurity and Interoperability for CIOs

The Impact of a Balanced Approach: The role of Chief Information Officers (CIOs) in healthcare has evolved significantly in the age of digital transformation. They now face a dual challenge: ensuring systems communicate effectively while maintaining robust cybersecurity. The delicate balance between interoperability and security is critical as it directly impacts patient care, organizational reputation, regulatory compliance, and financial stability.



Patient Safety

The primary concern in healthcare is always patient safety. While interoperability allows for seamless sharing of patient information, it can potentially expose sensitive data to security risks. CIOs must prioritize patient safety above all else, which includes safeguarding patient data against breaches, ensuring the integrity of medical records, and minimizing disruptions to healthcare services.



Data Privacy

Data privacy is a paramount concern in healthcare. Patients trust that their personal health information will remain confidential. CIOs must implement strict data privacy measures, including encryption, access controls, and regular audits, to maintain this trust. Privacy breaches can result in legal and ethical repercussions, underscoring the importance of a security-first mindset.



Regulatory Compliance

The healthcare industry is heavily regulated, with stringent data protection laws and standards like HIPAA (Health Insurance Portability and Accountability Act) and GDPR (General Data Protection Regulation) in place. CIOs must navigate this complex regulatory landscape, ensuring their organizations comply with all relevant laws. Non-compliance can result in severe penalties and damage to an organization's reputation.



Cost Efficiency

Balancing interoperability and security also has cost implications. Investing in cybersecurity measures can be expensive, but the cost of a data breach or cyberattack can be far higher. CIOs must carefully allocate resources to ensure their organizations are adequately protected while maintaining cost-efficiency.



Operational Continuity

Healthcare operations are critical and must remain uninterrupted. CIOs should design systems and processes with redundancy and disaster recovery plans to ensure operational continuity, even in the face of cyber threats. Downtime in healthcare can have life-threatening consequences, emphasizing the need for robust cybersecurity.



Trust

Trust is paramount in healthcare. Patients must trust that their data is safe, and healthcare providers must trust that systems will function reliably. CIOs play a central role in building and maintaining this trust, not only among patients but also among staff, clinicians, and partners.



Innovation and Future-Proofing

While focusing on security, CIOs must also foster innovation. Healthcare is rapidly evolving, with new technologies and treatments emerging regularly. Future-proofing IT systems to accommodate these innovations is a challenging but necessary task. CIOs should proactively assess emerging technologies and their potential impact on healthcare delivery.



Collaborative Care

Interoperability is crucial for collaborative care, where multiple healthcare providers coordinate patient care seamlessly. CIOs must champion collaborative solutions that allow healthcare teams to access patient data securely, leading to improved patient outcomes and more efficient care delivery.



Driving Digital Transformation in Healthcare

Global Health Challenges: The healthcare landscape faces several global challenges, necessitating a proactive approach to digital transformation:



Aging Population

Aging populations worldwide bring unique healthcare challenges. Rising service demands, the need for self-health management, evolving patient expectations, and the requirement for enhanced patient engagement and experience all converge to create a complex healthcare environment.



Healthcare Workforce Shortage

A shortage of healthcare professionals demands innovative approaches to service delivery. Organizations must explore new service models and strategies to retain staff while ensuring patient care remains high-quality and accessible.



Increasing Cost and Sustainability

Rising healthcare costs and economic uncertainty require healthcare organizations to find ways to provide quality care while managing expenses. Supply chain challenges further compound these issues, highlighting the need for cost-effective solutions.



Healthcare Accessibility

Access to healthcare remains a global concern. Disjointed healthcare services, long waiting times for public health services, and underdeveloped primary care, mental health, and specialist services underscore the importance of creating a more accessible services.



Key Success Factors

In a world of constantly evolving healthcare challenges, organizations have identified key success factors critical for driving digital health transformation:

- **A Sense of Urgency:** Transformation often gains momentum during major crises, such as a pandemic. Urgency catalyzes change, compelling organizations to prioritize digital transformation as a top-level concern.
- **Business Leader Ownership:** Successful transformations have business leaders who take ownership and accountability for connecting the dots between strategy and execution. Their leadership is instrumental in driving change.
- **Outcomes Established:** Organizations that thrive in the digital age have clear, quantified outcomes to achieve. These outcomes are defined in advance and are significant and recognizable, providing a tangible measure of transformation's impact.
- **Technology Enabled:** Digital transformation relies on technology as a key enabler. Modernizing technology platforms facilitates easy access, personalization, and automation, making healthcare more efficient and patient-centric.
- **Strong business leadership is vital.** Leaders must be assigned, visibly committed to, and actively involved in transformation initiatives.
- **A Design Thinking approach** that focuses on identifying pain points encourages staff to challenge old ways of working and adapt processes and procedures to leverage new digital technologies.
- **Identifying champions, empowering staff, promoting collaboration, and developing new skills** are key to engaging staff in the transformation and enabling cross-team and cross-discipline work.
- **Technology enablement, with a focus on adopting modernized technology, accelerates digital transformation.**
- **Clear, ambitious goals with well-defined objectives and key results help align efforts and ensure progress is measurable.**

Conclusion

The 2023 HIMSS APAC Health CIO Workshop held in Jakarta, Indonesia, marked a significant milestone in the journey toward digital transformation in healthcare. This report has encapsulated the insights, experiences, and collective wisdom shared by healthcare leaders and experts during the Workshop.

In today's rapidly evolving healthcare landscape, CIOs are not just technology stewards but strategic leaders guiding organizations toward a digital future. They play a pivotal role in ensuring that healthcare is patient-centric, data-driven, and secure.

From fostering a culture of continuous learning to strategically aligning IT initiatives with organizational goals, from embracing the latest technological advancements to prioritizing patient-centric care, and from navigating the complex landscape of cybersecurity and interoperability to embracing the key success factors for global digital health transformation, this report has covered a diverse array of topics that are instrumental in shaping the future of healthcare.

The key takeaways from this report underscore the critical importance of leadership, collaboration, technology enablement, and measurable progress. Strong business leadership, a commitment to innovation, and a focus on patient-centered care will be the pillars on which successful healthcare organizations will build their digital futures.

As healthcare organizations worldwide embark on their digital transformation journeys, it is our hope that the insights and lessons shared in this report will serve as valuable guidance. The road ahead may be challenging, but with the right strategies and unwavering commitment, healthcare can embrace the opportunities of the digital age to improve patient outcomes, enhance operational efficiency, and ultimately, transform lives.

