Looking back on digital health and innovation in Australian general practice

Rahul Mohan, Rob Hosking, Darran Foo

Background
Over the last 3 decades, Australian general practice has undergone profound digital transformation. From handwritten prescriptions and paper files to comprehensive practice management systems, each technological wave has promised efficiency while introducing new layers of complexity.

Objective
This paper traces the development of national digital health infrastructure, including unique healthcare identifiers, interoperability standards, My Health Record and electronic prescribing, and examines how these have progressively connected general practice within the broader health system, despite persistent challenges in seamless connection and usability.

Discussion
The COVID-19 pandemic acted as a catalyst, embedding telehealth and e-prescriptions as core elements of routine care. The emergence of cloud systems and artificial intelligence represents a new frontier, offering opportunities to streamline workflows and refocus care on the patient. Drawing lessons from past implementation efforts, this paper argues that success will depend on designing technologies grounded in usability, interoperability, equity and trust to ensure that innovation strengthens rather than fragments the therapeutic relationship.

STEP INTO A GENERAL PRACTITIONER'S (GP'S) OFFICE in the 1990s and it would feel like another world. Referrals were handwritten, prescriptions scrawled onto carbon pads and towering file cabinets groaned under the weight of manila folders. The fastest way information moved was through the shriek and hiss of a fax machine.

Fast forward to today, a child born in the digital age would scarcely recognise that clinic. Over the years we have seen the gradual but relentless computerisation of general practice, replacing pens with keyboards and paper with pixels. What began as a simple prescription-writing tool in the 1990s snowballed into full-suite practice management systems that transformed how GPs document, bill, prescribe, and coordinate care. By the mid-2000s, the computer was the pulse of the consulting room, with 90% of GPs using computers for clinical notes.[1,2]

But the journey of digital health in general practice has never been linear. Each wave of technology promised efficiency, yet often introduced new silos, complexities and demands. From the rise of clinical software and the creation of national digital health infrastructure to the challenges of secure messaging, interoperability and My Health Record (MHR), the story of digital health is as much about friction as it is about progress.

This retrospective traces how general practice has adapted across 3 decades of digital transformation, from the early days of software pioneers to the disruptive accelerant of COVID-19, and situates Australian general practice as an early and sustained leader in clinical computerisation. The purpose of this paper is to document that leadership, to reflect on policy and technological inflection points that shaped current infrastructure, and to identify practical lessons to inform the next phase of digitally enabled primary care as the sector enters the era of artificial intelligence (AI).

Early practice management software history

The introduction of practice management software (PMS) marked one of the most significant digital transformations in Australian general practice.

From the late 1980s, several Australian GPs and programmers experimented with early electronic medical record systems that laid the groundwork for modern PMS. Examples, as stated in written communications from Associate Professor Oliver Frank (MBBS, PhD, FRACGP, FAIDH) in October 2025, included Medrecord, which ran on the Pick operating system and impressively supported four users on 64K memory; JAM Software; LOCUM developed by Drs Hugh and Heather Leslie; MARS by Dr John Emery; MIMScript by Dr John Angie; and Rx Medical, which later evolved into Zedmed.

Alongside this activity, The Royal Australian College of General Practitioners (RACGP) Informatics Committee hosted a series of 'computer conferences' through the late 1980s and 1990s, which fostered collaboration between clinicians, vendors, and policymakers around the emerging role of information technology in primary care (Figure 1).[3]

One of the notable systems that emerged from this period was MedicalDirector. Known for its broad uptake, it was co-founded in the early 1990s by GPs Dr Frank Pyefinch and Dr Andrew Magennis (Figure 2), and began as a DOS-based prescription tool that rapidly expanded to include billing, clinical notes, test results, prescribing and decision support.[4] Its availability as a free, advertising-supported product coincided with federal government incentives and sustained hands-on support from Divisions of General Practice and the General Practice Computing Group (chaired initially by Professor Michael Kidd), which provided training, troubleshooting and on-site assistance from the 1990s through to My Health Record (MHR) implementation, collectively accelerating computerisation across general practice.[5,6] Dr Pyefinch went on to establish Best Practice in 2004, which was clinician-focused and innovative, establishing itself as the leading PMS in Australia within a decade.[7,8]

Today, both MedicalDirector and Best Practice are joined by a growing number of competitors and newer cloud-based entrants in the PMS market. The evolution of these systems underscores the interplay between clinician-led innovation, government policy and market dynamics in shaping Australia's digital primary care infrastructure.

Figure 1. Pictures from the 1987 RACGP 5th Computer Conference, Melbourne Exhibition Centre.
Reproduced from The Australian College of General Practitioners (RACGP). RACGP conferences across the years – a montage. RACGP, updated April 2021 (www.racgp.org.au/the-racgp/history/history-of-the-racgp/racgp-conferences-across-the-years-a-montage), with permission from the RACGP History Committee.

Figure 2. Medical Director booth at the 1996 RACGP Annual Scientific Convention (ASC), Perth.
Reproduced from The Australian College of General Practitioners (RACGP). RACGP conferences across the years – a montage. RACGP, updated April 2021 (www.racgp.org.au/the-racgp/history/history-of-the-racgp/racgp-conferences-across-the-years-a-montage), with permission from the RACGP History Committee.

Building the digital health architecture

The rapid adoption of computers and PMSs transformed the consultation room. Computers became the focal point, dividing the space between the doctor's chair and the examination bed.[6] While efficiency improved dramatically, the proliferation of proprietary systems also created 'walled gardens', silos of data that limited information sharing and set the stage for a national push towards interoperability.[9]

By the mid-2000s, it was clear that the efficiency at the clinic level was not enough, leading to the realisation that interconnectivity was to be the next big hurdle for continued digital transformation across the health system.[4,10] The vast silos of medical information were starting to be a strain on the health system, and access to personal health data emerged as a national priority. On the back of this, the National Electronic Health Transition Authority (NEHTA) was born in 2005 to provide the building blocks for an interconnected system.[1,2,5,9] This had clinician input with a team of over 80 clinicians under the leadership of Dr Mukesh Haikerwal, who also articulated the reform agenda in contemporaneous policy and editorial work that helped shape the national primary care reform and the Personally Controlled Electronic Health Record (PCEHR) program.[11]

NEHTA delivered several key foundational systems to enable a nationally connected health record such as the Health Identifier service and NASH (National Authentication Service for Health). For example, when a GP uses their software to generate an electronic prescription, the authentication service confirms the patient's IHI (Individual Healthcare Identifier), the prescriber's HPI-I (Healthcare Provider Identifier–Individual), and the receiving service, allowing the transaction to be validated securely and in real time.[5,12] These are critical services in use today and the envy of many countries.

NEHTA also adopted Systematized Nomenclature of Medicine – Clinical Terms AU (SNOMED CT-AU), providing a single unified language across all clinical information systems.[13,14] Standardised terminology enables health data to be aggregated and retrieved consistently, supporting accurate data extraction for clinical reviews, research purposes and internal quality improvements.[10,12]

NEHTA subsequently launched the PCEHR as the government's vision for an all-inclusive health record.[5,15] The uptake was slow due to lack of interconnectivity, and it was poorly received by clinicians and patients. Following its lukewarm reception, PCEHR was repurposed as MHR in 2017 under the new ADHA (Australian Digital Health Agency) which was a transitioned version of NEHTA.[5,12,13,16] The MHR was controversially changed to be an opt out solution to ensure large scale adoption. While adoption has improved significantly, there are still lingering concerns regarding usability, clinical value, and privacy[10,17] and there is significant new government funding to modernise the MHR and new legislation to mandate 'sharing by default'.[18]

These limitations highlighted a broader issue: without effective interoperability and secure messaging, even national records like My Health Record could not fully deliver on their promise. Despite repeated calls for GPs, and the organisations they communicate with, to move beyond the fax machine, progress has been slow.[19–21] Although secure messaging technologies have been available for more than 2 decades, their implementation has faltered. Early clinical software systems were developed independently, without interoperability as a priority, creating silos that compounded over time. Uncertainty about competing secure messaging solutions further discouraged uptake, leaving faxing and postal services as an easier option for many clinicians. To address these barriers, the ADHA introduced the Australian-developed Fast Healthcare Interoperability Resources (FHIR) standards.[13,20,22] This development with CSIRO (Commonwealth Scientific and Industrial Research Organisation) in partnership with ADHA and many clinicians and software developers, is seeing great positivity around interoperability. While FHIR has alleviated some interoperability challenges, widespread adoption is still required to achieve a safe, effective and universally accessible messaging system.[23] Health Connect Australia is the federal government's initiative to improve interoperability by the development of a nationwide Health Information Exchange.[24]

The COVID-19 accelerant

While these national initiatives laid the groundwork for a connected digital health system, it was the COVID-19 pandemic that truly stress-tested this architecture, accelerating telehealth and other digital solutions from peripheral tools to core elements of general practice.

Almost overnight, telehealth shifted from being a niche service used mainly in rural and remote contexts to a mainstream mode of care delivery.[25–27] Although the technology had long existed, uptake was limited by concerns over the lack of physical examination, technical barriers, patient hesitancy and the absence of Medicare funding for virtual consultations. The pandemic removed these barriers, with urgent demand, rapid policy change and new Medicare rebates driving unprecedented uptake. Within weeks, virtual care was firmly embedded in general practice, demonstrating how systemic pressures could accelerate adoption where years of planning and infrastructure had struggled to do so.[28,29]

The rapid uptake of telehealth during the pandemic also acted as a catalyst for electronic prescribing. Although a national framework for eScripts had been in place since 2019, implementation was slow and uneven, with limited incentives for both prescribers and software vendors to prioritise adoption.[29] COVID-19 created an immediate need for contactless, streamlined prescribing processes to complement virtual consultations, and eScripts moved from peripheral to essential overnight.[29]

The National Prescription Delivery Service (NPDS) enabled two models of electronic prescribing, the Token model and the Active Script List (ASL) model.[30–32] Together, these models streamlined prescribing, improved convenience and reduced reliance on paper-based processes, changes that have since become a permanent feature of general practice. We have also seen the development of National Electronic Medication Chart standards for aged care facilities which is enabling remote access and seamless collaboration with GPs, aged care staff and pharmacists.[15]

The modern era: Cloud systems and artificial intelligence

The last decade has ushered in a new phase of digital health, marked by the rise of cloud-based systems and AI in primary care. Platforms that aggregate de-identified practice data for quality improvement and population health management now support benchmarking, preventive care prompts and commissioning decisions, extending the

value of general practice data beyond the individual consultation. Cloud platforms now enable practices to operate beyond the four walls of the clinic, offering mobility, real-time data access and integration with the broader digital health ecosystem.[33,34] Yet, they also revive familiar concerns around data sovereignty, privacy and reliability.

At the same time, AI technologies are beginning to shape everyday practice. Early applications include AI scribes that automate clinical documentation, decision support systems that guide diagnoses and prescribing and patient-facing tools that enhance self-management.[35–38] As with past innovations, their potential lies in efficiency and safety gains, but history reminds us that poorly integrated systems risk adding new layers of complexity rather than reducing them.

Conclusion

General practice has always been about balancing clinical expertise, human connection and efficiency in the face of ever-growing demands. While digital health has brought both progress and complexity, AI offers the chance to reclaim time lost to clicks and screens. Guided by the lessons of the past, with an emphasis on usability, interoperability, equity and trust, these emerging technologies have the potential to transform digital complexity into simplicity and restore the focus of care to where it belongs: the patient.

Key points

- Australian general practice has led global clinical computerisation through clinician innovation and government incentives.
- Foundational infrastructure like healthcare identifiers, SNOMED CT-AU and FHIR enables interoperability but needs sustained investment.
- Crises like COVID-19 accelerate digital adoption far faster than incremental planning.
- AI and cloud-based tools can reduce administration burden but risk adding new complexity if poorly integrated.
- Digital health must prioritise usability, interoperability, equity and trust.

Authors

Rahul Mohan BMed, MD, DCH, CHIA, FRACGP, General Practitioner, TMRW Health, Surry Hills, NSW; Member, The Royal Australian College of General Practitioners Digital Health and Innovation Specific Interest Group, Sydney, NSW

Rob Hosking MBBS, FRACGP, FAIDH, Chair, The Royal Australian College of General Practitioners Expert Committee Practice Technology and Management, Melbourne, Vic

Darran Foo BMed, MD, FRACGP, Deputy Chair, The Royal Australian College of General Practitioners Digital Health and Innovation Specific Interest Group, Sydney, NSW; Chief Medical Information Officer (APAC), Heidi, Sydney, NSW

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Correspondence to:
zhiyongdarran.foo@hdr.mq.edu.au

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