School of Nursing, Paramedicine and Healthcare Sciences

# An exploration of digital health capability in Australian paramedicine

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## Introduction

Digital health is an evolving area which broadly refers to a range of technologies which support the provision of healthcare. They include diverse elements such as the curation and management of patient data, the use of digital communication modalities, and the use of technology to augment and enhance clinical practice and clinical education.[1,2] Digital health is more than a collection of independent technologies, it also represents a paradigm shift in how healthcare is delivered.

## Paramedicine and Digital Health

Paramedics are no strangers to technologies. However, paramedic practice is often driven by emerging technologies rather than having technology integrated into core practice. In many cases paramedics inherit hospital technology which has been made small enough and rugged enough for out-of-hospital use. New paradigms of practice, however, can leverage the adaptability and utility of paramedics. There have been several notable examples of paramedic being early adopters of technology such as remote patient monitoring, interprofessional communication, and telehealth.[3-6] Despite the introduction of a range of digital health initiatives in paramedicine, the capacity of paramedics to engage in digital health, especially in a comprehensive and structured way is limited. Analysis of digital health capability in paramedicine suggests paramedicine is poorly positioned to engage in the rapidly growing area of digital health practice and that practitioners are poorly trained in digital health both conceptually and practically.[7-8] There is a paucity of research in digital health in relation to paramedicine as well as a lack of integration of digital health competencies in paramedicine education.

## Benefits of Digital Literacy and Digital Capability

There are significant advantages to building digital competency. Paramedics with digital literacy have been shown to increase innovation in their practice and better engage with emerging technologies.[9] Likewise, paramedics with digital capabilities can contribute themselves to technological development and digital health practice.[10] Digital literacy is recognised as a key element to support safe and effective decision-making.[7] Additionally, digital health is seen as a key element in cooperative interprofessional care with potential for providing optimal patient outcomes.[11]

## Discussion

Digital health is an area which has historically been seen as an adjunct in paramedicine but not a core area of practice. Within paramedicine, competencies and practice domains are potentially underrepresented suggested a poor focus on digital health as a practice modality. Some areas such as community paramedicine has already been engaged in the early adoption of technology in areas such as remote patient monitoring.[3] The COVID-19 pandemic also creates an environment for rapid adoption of technology in community paramedicine much as it did in many other areas of health.[12]

Given the increasing use of different aspects of digital health such as telemedicine, e-health records, mobile decision-making applications, and digital assessment technology; it is critical that an understanding of digital health is embedded in paramedic practice as a key knowledge area both in entry-to-practice education and wider paramedic practice. There are a range of challenges regarding digital health in paramedicine including a poor understanding of digital health frameworks, a low level of digital health literacy in academic staff working in entry-to-practice programs and poor clarity in digital health standards. It is critical that paramedicine adopts a clearer set of standards and engaged with digital health frameworks, or there is significant risk paramedicine will be left behind as digital health increasingly influences healthcare policy and practice reform.[8]
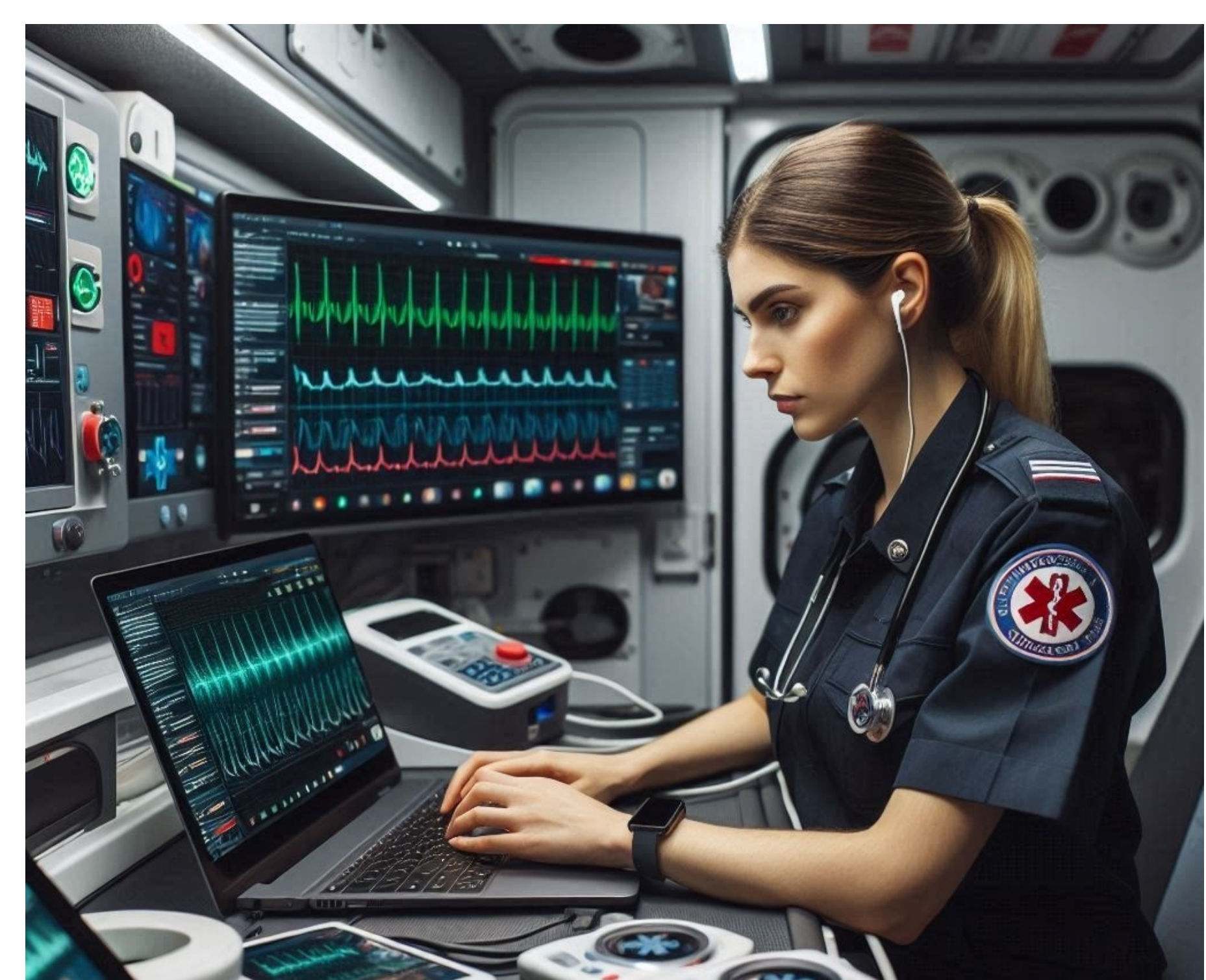
## Advances in Digital Health

What are the emerging areas of Digital Health?
1. AI and Machine Learning (ML):
   - AI algorithms analyse data, predict diseases, and personalise treatments.
   - ML models assist in diagnosis and drug discovery.
2. Telehealth and Telemedicine:
   - Remote consultations via telehealth services.
   - Virtual reality telemedicine and holographic interactions.
3. Wearable Devices and Sensors:
   - Wearables track health data.
   - Implantable biosensors and nanobots for continuous monitoring.
4. Blockchain for Health Data Security:
   - Secure health record sharing using blockchain.
   - Decentralised networks protect privacy.
5. Genomics and Personalized Medicine:
   - Genomic testing guides treatment decisions.
   - Gene editing therapies and personalised drug cocktails.
6. Virtual Reality (VR) and Augmented Reality (AR):
   - VR aids training and pain management.
   - AR overlays enhance surgical precision.
7. Health Apps and Digital Therapeutics:
   - Mobile apps focus on mental health and wellness.
   - Prescription digital therapeutics replace drugs.
8. Robotics and Automation:
   - Surgical robots assist surgeons.
   - Robotic exoskeletons aid rehabilitation.
9. Internet of Things (IoT) in Healthcare:
   - IoT devices connect medical equipment.
   - Smart hospitals optimise patient care.
10. Bioprinting and Organ Regeneration:
    - 3D bioprinting creates tissues.
    - Lab-grown organs and regenerative medicine.
*(List compiled by Microsoft Co-Pilot using Chat GPT4.0)*

## Capability Frameworks

Australia has a adopted a capability framework which will be integrated into the pre-employment training of all registered health professionals. The Australian Digital Health Capability Action Plan relies on a range of strategies including improvements in governance, training and frameworks and guidelines.[13] This capability framework provides an example of a set of core competencies for all health professionals which would underpin digital health literacy.

Paramedics globally will need to adopt similar frameworks to Increase the capability of the workforce to engage in digital health. With the introduction of new technologies and digital platforms occurring at an exponential rate, it is critical that digital literacy is considered a core skill for health professionals.
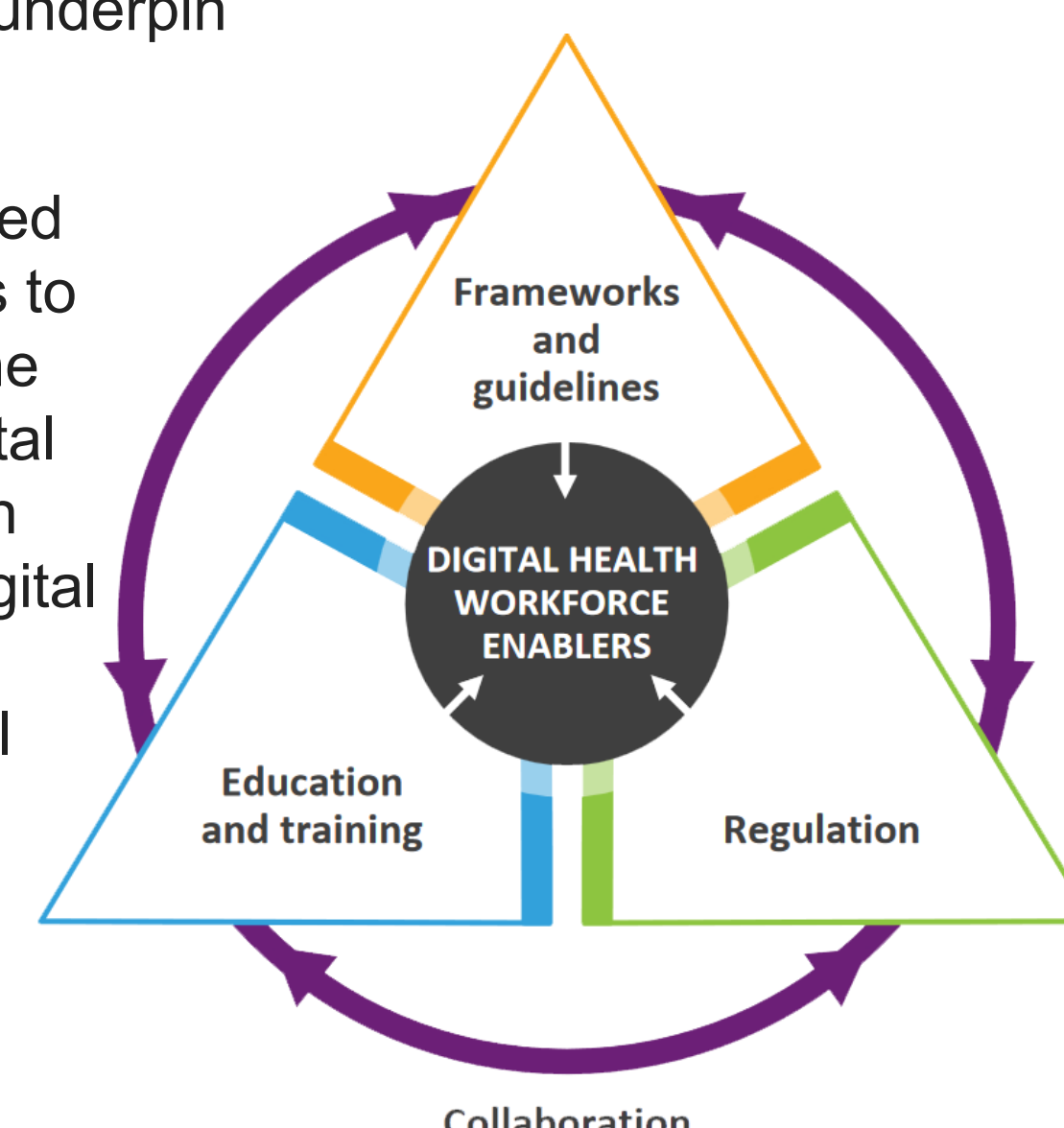


## Strategies for Capability Building

1. Digital Professionalism:
   - **Maintain Professional Standards**: Healthcare professionals should adhere to ethical and legal standards when using digital technologies. This includes respecting patient privacy, confidentiality, and appropriate communication online[3].
   - **Online Identity**: Encourage professionals to create and manage a positive online presence. This involves understanding how to use social media responsibly and professionally.
2. Leadership and Advocacy:
   - **Digital Health Leadership**: Develop leadership skills related to digital health. Professionals should advocate for the adoption of digital technologies and promote their benefits within their organizations[2].
   - **Workplace Leadership**: Encourage professionals to lead digital change initiatives within their workplaces. This involves championing digital transformation and supporting colleagues in adopting new tools and practices.
3. Data and Information Quality:
   - **Data Integrity**: Emphasize the importance of accurate and high-quality data. Professionals should understand data capture methods, validation, and data integrity for decision-making.
   - **Information Enabled Care and Services**: Train professionals to use reliable information sources and critically evaluate data. Enable evidence-based decision-making through digital health tools.
4. Reasoning and Evaluation:
   - **Critical Thinking**: Foster critical thinking skills related to digital health. Professionals should evaluate the effectiveness and impact of digital interventions[1].
   - **Problem Solving and Feedback**: Encourage problem-solving abilities when faced with digital challenges. Professionals should seek feedback and continuously improve their digital practices.
5. Technology:
   - **Appropriate Technologies**: Provide training on selecting and using appropriate digital tools. Professionals should understand the benefits and limitations of different technologies.
   - **Digital Health Controls**: Educate professionals about security, privacy, and risk management related to digital health systems.

*(List compiled by Microsoft Co-Pilot using Chat GPT4.0)*

## Australian Digital Health Capability Framework
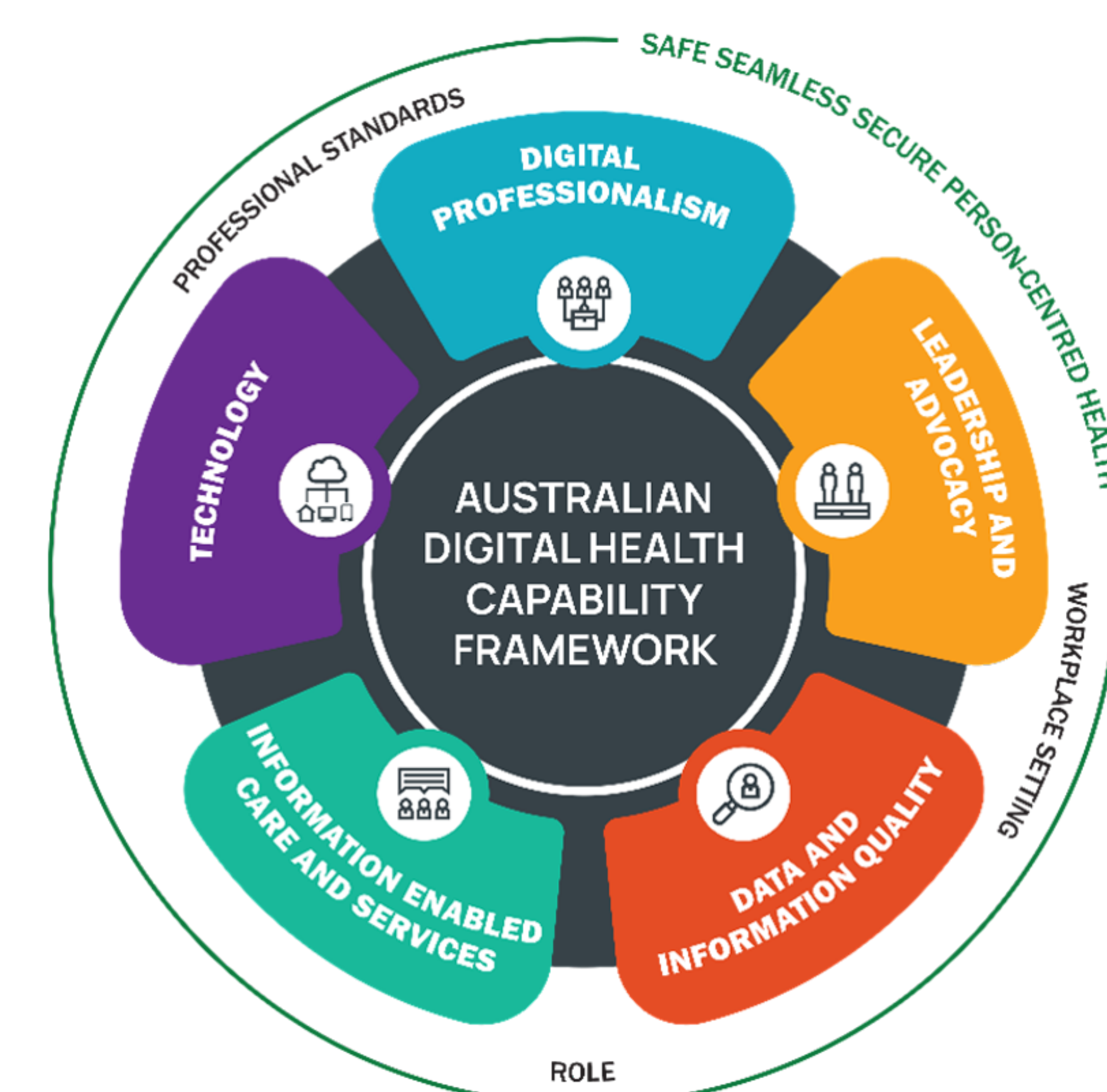


## Assess your Digital Health Capability Here
(Mapped against the ADHCF)

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