# : What is Technology Leapfrogging?

Ciara Heavin

and Daniel J. Power

The Winter 2020 global coronavirus outbreak created a significant impetus to adopt new technologies to support and manage the response to this pandemic. Some might say that we are currently witnessing "Technology Leapfrogging" in areas such as education and healthcare. In some situations, it possible to "move forward rapidly through the adoption of modern systems without going through intermediary steps" cf., Leapfrog Digital Strategies (2019). Technology leapfrogging occurs when decision-makers choose to adopt leading-edge technology, skipping one or more technology generations. For example, going straight from only using face-to-face to exclusively using Zoom or Microsoft Teams for collaboration and meetings.

People, organizations, and countries with inadequate or poorly-developed technology can sometimes move forward rapidly to greater technological sophistication and jump ahead or make rapid and nonlinear progress. Technology leapfrogging is the adoption of the current, most advanced technology solutions without going through the adoption and use of older, legacy technologies. Technology leapfrogging involves bypassing or skipping one or more intermediate stages of technology evolution to catch up with competitors or peers, cf., Lee and Lim (2001). Moving to unproven technologies does have challenges and risks.

Prior theory proposes four stages of technology leapfrogging (Tan et al., 2018), that include:

1. Psyching: devising a technology blueprint

2. Planting: laying the foundation for technology development

3. Propelling: operationalising the plan including leveraging existing technological capabilities, and

4. Perpetuating: maintaining the trajectory for technology development,

These stages outline an overarching strategic plan for technology leapfrogging and also describes specific activities that need to occur to achieve the plan. We briefly explore the recent “Technology Leapfrogging” in healthcare. Digitization of healthcare is occurring in a number of ways, we have identified two key areas. First, we are observing significant technology investment aimed at creating new capacity and efficiencies in healthcare systems. These technologies enable healthcare professionals to screen, assess, diagnose, and monitor patients with coronavirus, as well as to

contact trace for new incidences of a communicable disease. As a result, there has been a recent surge in purchasing multiple Covid-19 related technologies.

Second, against a backdrop of the Covid-19 crisis, there is pressure to maintain “business as usual” in existing healthcare services. For example, primary care services and home healthcare-related services for palliative care and stroke patients and their families are changing. Technologies like electronic health records (EHR) are required and enhanced. Indeed, healthcare professionals recognize that the people who had chronic conditions and were seriously ill before the Covid-19 outbreak remain ill and continue to require treatment. People continue to experience heart attacks and strokes requiring medical attention in acute hospital settings and follow-up care in the community. Providing a wide array of health services is an ongoing need.

The creation of new ICT systems often requires a diverse range of available information and computing technologies, i.e., an ICT bricolage approach described by Tan et al. (2018). Decision-makers and healthcare professionals are working hard to leverage existing available technology such as video conferencing platforms as well as to investigate new digital solutions like smart systems to support and enable the delivery of care to the community during a time where the movement of people is restricted and face-to-face access to patients is limited.

In this new remote, social distancing world, the digital transformation of healthcare has resulted in an increase in mobile Health (mHealth) apps for screening, monitoring, and tracking both data and information individuals and population trends. The need for secure, accessible, cost-effective telemedicine and devices for remote patient monitoring has increased exponentially. “Big Health Data” is used by medical experts and healthcare professionals to provide data-based decision support for many uses, including informing government leaders as they respond to the current crisis. Data enables decision-makers to optimize the use of scarce resources and predict health outcomes.

Selecting technologies that are “fit for purpose”, particularly when there are time pressures, remains a challenge. When should simple analog thermometers be replaced with digital thermometers? When should no contact digital thermometers with blue tooth connectivity be purchased and integrated as part of a patient monitoring system? How cost-effective is the most recent innovation? Education about information technologies remains a significant barrier to the widespread adoption and use of new technology in such a short timeframe. This is a challenge for stakeholders including managers, educators, healthcare professionals, students, and patients.

Technology by itself does not solve problems (Fong, 20133). In some ways, the recent “technology leapfrogging” and the digital adoption acceleration experienced in some sectors may inadvertently create a "brave new world" of artificial intelligence (AI), robotic processes, and continuous

monitoring/engagement through IoT and smartphone technology.

**References**

Fong, M. W, L. (2013). "Technology Leapfrogging for Developing Countries," Journalist Resource, pp. 3707-3713 at URL https://journalistsresource.org/wp-content/uploads/2013/04/Technology-Leapfrogging-for-Developing-Countries.pdf

Leapfrog Digital Strategies (2019). Leapfrogging, Retrieved from https://leapfrog.cl/en/leapfrogging

Lee, K, and C. Lim (2001). "Technological regimes, catching-up and leapfrogging: findings from the Korean industries," Research Policy, Elsevier, vol. 30(3), pages 459-483, March.

Tan, B., Ng, J., Jiang, J. (2018). The process of Technology Leapfrogging, International Journal of Information Management, 38, 311-316. DOI: https://doi.org/10.1016/j.ijinfomgt.2017.10.008

Winthrop, R. and E. McGivney with A. Barton, "Can We Leapfrog? The Potential of Education Innovations to Rapidly Accelerate Progress," Center for Universal Education at Brookings, at URL https://files.eric.ed.gov/fulltext/ED583015.pdf

Author: Daniel Power
Last update: 2020-05-09 10:38