[DRAFT] MedBiquitous 2030: Building the Digital Ecosystem for Health Professions Education

Author: Johmarx Patton
Date: April 13, 2021
Status: DRAFT

Background

A consistent challenge that MedBiquitous has been called upon to address is bringing to bear a distributed set of tools and resources in support of health professions education (HPE) and credentialing. Although the MedBiquitous community has answered this call on multiple occasions, the challenge remains that the adoption of the standards and guidelines produced by the community occurs only in niche pockets, rather than by the HPE community at large. All industries have standards, many of which are applicable to HPE. It is our goal to educate the community on the importance of harmonizing standards across industries and acknowledge their impact on HPE.

Professional education, and society at large, has seen tremendous growth in key areas such as social networking, the "sharing economy," interprofessional education, open educational resources and integrated curricula. These changes are driven by deep-seated human values such as sharing, collaboration, and community. Rather than acting in their silos, individuals and organizations are yearning to be a part of a cohesive and functional ecosystem. In our current world, digital tools provide affordances that were not available in the paper-based world that proceeded it. Taking a digital ecosystem perspective when looking at HPE, and healthcare broadly, lends itself to an approach that will increase an understanding and adoption of standards and lead towards improving efficiencies across all areas of HPE.

In describing the potential of the Digital Ecosystem for Health Professions Education, the MedBiquitous Steering Committee expressed the following attributes:

- Frictionless sharing of information between systems that enable institutions to deliver on their mission;
- Enabling the recombination of curricula and assessments across modality and source;
- Learner-centric and portable with the learner across the continuum of learning;
- An environment for different types of organizations that are digitally enabled to connect with each other for compiling of operational data, or sharing data for a collaborative research or innovation; and,
- A comprehensive system that encompasses all the required educational tools and processes, from a variety of providers – digital diversity, utilizing systems that are practical, relevant and appropriate for the organization, based on accepted data exchange standards.

The MedBiquitous Steering Committee aims to align with the common attributes of a digital ecosystem being a distributed, adaptive, open socio-technical system with properties of self-organization, scalability and sustainability inspired from natural ecosystems. Digital ecosystem models are informed by knowledge of natural ecosystems, especially for aspects related to competition and collaboration among diverse entities. When looking at this definition, the power of bringing together all stakeholders in HPE to understand the importance of a digital ecosystem becomes apparent and other industries have recognized this power as well:

> "In a digital ecosystem, many largely independent economic players join forces to create a digital offering that is more valuable than a single company's product or

> service. Some digital ecosystems develop solutions… Others bring together buyers and sellers on a digital platform.
>
> This new collaboration model isn't a fad; it's the future of business. Many of the world's largest companies are part of vast digital ecosystems that are disrupting not just their industries but broad swaths of the economy." [i]

Current Challenges

The extensive use of education technology, including within the health professions that MedBiquitous supports, continues to grow and mature. The scope of educational technology includes information and learning technology used to deliver and support the education of healthcare professionals, as well as the data management and data exchange practices of all entities involved in education and credentialing of these professionals.

In the last year, the global COVID-19 pandemic has exposed the fragility of our existing technology infrastructure. The delivery of education and the verification of credentials are just two examples of high-level processes that were disrupted and rapidly modified to accommodate changes that accompanied the pandemic. In almost every case, silos between existing technologies and data sets were made abundantly apparent, and integration and interoperability were touted as solutions to this dilemma.

Educators, technology professionals, and government and regulatory agencies are all attempting to improve the state of health professions education and credentialing. However, the challenges faced are manifold:

- Duplication of effort, immature data management practices, local/proprietary software integrations, and increasing software/technology costs often lead to an environment where efficiency gains and cost savings are hard to achieve;
- Policy and legal barriers can be difficult to overcome at the level of the individual or individual organization;
- A lack of attention to critical accessibility and interoperability requirements can hamper uptake of technology innovations in learning design and delivery, and prevent improved efficiency in administrative processes; and,
- Data management practices are only recently becoming part of standard operating procedures; poor data quality leads to delays in continuous quality improvement of education and credentialing activities.

Goals for MedBiquitous 2030

To encourage the adoption of data and other technology standards in support of health professions education and credentialing, as well as to promote best practices towards the goal of implementing a learning healthcare system, the MedBiquitous 2030 initiative aims to:

- administer a neutral forum, across the continuum of education, between the health professions, inclusive of all relevant stakeholders, with a global reach, to understand the health professions education landscape and its evolution over the next 10 years;
- use the MedBiquitous consensus process to gather necessary input to develop recommendations for an HPE digital ecosystem and relevant standards; and,
- provide universal access to the standards needed to realize a thriving digital ecosystem by the year 2030.

The ability to communicate information between accreditors, education programs, credentialing bodies, learners and employers is still a largely manual process in 2021, often requiring data manipulation to send or consume data. The ultimate objective of a single platform/tool to support the variety of activities for education and training programs, continuing education offices, or credentialing bodies will likely remain an elusive and indeed aspirational target. However, creating a curriculum inventory; delivering competency-based assessments and tracking learner outcomes; and sharing of simulation and diverse,

varied learning resources, with the ability to perform analytics across systems, could be achieved across multiple tools and systems using information technology standards.

Building towards an ideal future state, a digital ecosystem for health professions education, would enable the following scenarios:

Health Professional Lifelong Learning and Employment Record (LER)

Utilizing the Performance Framework, Educational Achievement, other relevant MedBiquitous standards and emerging credentials standards, integration of data will lead to the development of lifelong portfolios of learning and employment records. These portfolios are mapped to competency frameworks for their profession and portable with learners as they move through their career. Pragmatically, data flows seamlessly, decompressing the manual efforts required in the current state to weave all data together.

The portability of learning and employment data creates a streamlined approach to determining the educational trajectory of the individual from one context to the next. It also allows training programs to benchmark their learners' outcomes against their peers. Ultimately, it allows each institution and the healthcare system to develop competent health professionals who can continuously monitor their own knowledge, skills, behaviors and attitudes, then subsequently adjust where needed.

Health Professions Education Curriculum Exchange

Competencies and learning objectives. Curricular content. Assessments. Simulated patients. The volume of resources utilized to run a training program are significant, and highly overlap from one training program to the next.

In a future state, by utilizing the Healthcare LOM (Learning Object Metadata), Virtual Patient and other relevant standards, curricular content can be repurposed from one training program to another and any evaluation data about the outcomes from that implementation can be used to refine the content for future use.

A curriculum with modular curricular resources that are appropriately tagged with learning objectives and competencies can be tailored to an individual's acquisition of new knowledge and remediation of existing skills can be created quickly and easily. Competencies measured in one profession can be compared to another profession. The educational interventions that are utilized to achieve and maintain competence can be monitored for effectiveness, allowing for better personalization of the curriculum for the individual learner.

Assessment collaboratives that coordinate development and sharing of assessments to meet the needs of multiple types of learners across institutions and professions can be achieved due to standards that permit the sharing of content and comparison of outcomes data.

Comparison of training programs across health professions can be achieved by utilizing the Curriculum Inventory standard, and new training programs can quickly learn from the structure of existing programs to develop their curriculum.

Health Professions Education and Credentialing Analytics

The aggregation of data from multiple institutions, sometimes within an organization, will be achieved utilizing data standards. By using Professional Profile, Activity Report, and other relevant standards, education programs or multi-institution consortia can fast track the development of data marts or federated data exchanges. Data standards provide the common language that eliminates ambiguity of the data. Collaborations on curricular innovations, research, and quality improvement are unbounded by the concern of what the data will become when brought together.

With improvements in data sharing capabilities, better research can be conducted on the linkage between educational interventions and clinical outcomes; more support can be confirmed for best practices in health professions education; and alignment can be demonstrated across health professions curricula.

When performing continuous quality improvement or preparing for accreditation, data can be utilized for internal longitudinal analysis or external benchmarking. Comprehensive visibility into the activities of an education program, including experiential learning in the clinical environment, allows an education

program to perform the necessary analytics to fully adapt to societal and healthcare needs, perform outcomes-based research, and provide for high-quality education and training technology innovation.

-

In summary, by establishing these goals for the future of health professions education and credentialing we can provide for an HPE digital ecosystem that fully supports and results in improving the health of people everywhere.

Objectives for MedBiquitous 2030

- MedBiquitous 2030 will serve as an education campaign for the HPE community on the importance of data and other information technology standards in advancing the mission of the health professions
- This initiative will set the prioritization principles for the standards development work of the MedBiquitous community through 2025
- Existing MedBiquitous standards will be approved as American National Standards (ANS) – target completion Dec 2021
- Prioritization of standards revisions and innovations will be determined by their importance in the overall digital ecosystem
- Standards adoption and implementation metrics will be determined by the Technical Advisory Group
- On an ongoing basis, IEEE and other standards relevant to health professions education and credentialing will be identified for inclusion in the MedBiquitous 2030 recommendations by the Research and Alignment Group
- An open repository of data and other technology standards, technical guidelines, implementation best practices, and other resources will be developed to serve as a recommendation to reduce barriers for adoption and implementation of technology to support health professions education and credentialing
- By 2030, key elements in a global learning health system that continuously improves and tracks educational outcomes of learners at all levels will be established

Proposed Plan

Planning Phase

In the first half of 2021, a working group will be created by the Steering Committee and its subcommittees. The methods for execution and evaluation of the proposed plan for MedBiquitous 2030 will be their primary focus. This working group will serve as the hub for any other work related to the initiative.

The target for publishing these methods is November 1, 2021.

Research and Alignment Phase

Utilizing the methods created in first phase of MedBiquitous 2030, use cases will be developed that will establish which development efforts will be prioritized.

The target for starting this phase is January 1, 2022.

This phase will result in the creation of new development projects and collaborations with other standards developers. The target end date for this phase is 2025. It will overlap with the next phase. Research and alignment activities will be ongoing.

Adoption Phase

This phase of MedBiquitous 2030 will focus heavily on promoting the adoption of standards and begin to capture metrics describing the efficiency of the system.

The target for starting this phase will be 2023. Adoption activities will be on-going.

Continuous Improvement Phase

As the adoption phase begins to peak, the activities in this phase will be designed to monitor the initiative and adjust MedBiquitous priorities for development efforts.

The target for starting this phase is 2025. It will be on-going.

[i] BCG.com. (2021, March 25). Digital Ecosystems. *Boston Consulting Group*. Retrieved from https://www.bcg.com/capabilities/digital-technology-data/digital-ecosystems