MedBiquitous® 2030: Building the Digital Ecosystem for Health Professions Education

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Background

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

Professions 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 have been 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 not available in the paper-based world that preceded it. Taking a digital ecosystem perspective when looking at HPE, and health care broadly, will increase understanding and adoption of standards that improve efficiencies across all areas of HPE.

In describing the potential of a 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.
- A learner-centric environment with portable records 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 collaborative research or innovation.
- A comprehensive system that encompasses all the required educational tools and processes from a variety of providers and that is digitally diverse, using systems that are practical, relevant, and appropriate for the organization, based on accepted data exchange standards.

The MedBiquitous Steering Committee aims to align these attributes with the common attributes of a digital ecosystem that is a distributed, adaptive, open sociotechnical system with properties of self-organization, scalability, and sustainability inspired by 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. The Boston Consulting Group, which works with a range of industries, described:

> "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."[1]

Current Challenges for an HPE Digital Ecosystem

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

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 make efficiency gains and cost savings 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.
- 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 toward the goal of implementing a learning health care system, the MedBiquitous 2030 initiative aims to:

- Support the evolution of the health professions education landscape. To understand this landscape, MedBiquitous administers a neutral forum among the health professions along the continuum of education, inclusive of all relevant stakeholders, with a global reach. Over the next 10 years, MedBiquitous 2030 will focus on:
    - Inclusion of technology developers with high impact on health professions schools.
    - U.S. systems of licensure and credentialing.
    - Collaboration with government and regulatory agencies.
    - Representation from health professions beyond medicine and nursing (dentistry, veterinary medicine, pharmacy, etc.).
- Use the MedBiquitous consensus process to gather necessary input to develop recommendations for an HPE digital ecosystem and relevant standards.
- 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 or tool to support the variety of activities for education and training programs, continuing education offices, or credentialing bodies will

likely remain an elusive and aspirational target. However, by using IT standards, stakeholders can create a curriculum inventory, deliver competency-based assessments and track learner outcomes, and share simulation and other diverse learning resources, with the ability to perform analytics across systems.

Case Scenarios Modeling a Future Digital Ecosystem for HPE

Building toward an ideal future digital ecosystem for health professions education would enable the following scenarios:

Health Professional Lifelong Learning and Employment Record (LER). Using the Performance Framework, Educational Achievement, other relevant MedBiquitous standards, and emerging credentials standards, the 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 professions and are portable with learners as they move through their careers. Pragmatically, data flows seamlessly, decompressing the manual efforts currently required to weave all data together.

The portability of learning and employment data creates a streamlined approach to determining an individual's educational trajectory from one context to the next. It also allows training programs to monitor their learners' outcomes toward nationally created milestones. Ultimately, it allows each institution and the health care 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, and simulated patients are among the significant number of resources used to run a training program and overlap considerably from one training program to the next.

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

A curriculum with modular curricular resources that are appropriately tagged with learning objectives and competencies will be tailored to an individual's acquisition of new knowledge, and remediation of existing skills will be created quickly and easily. Competencies measured in one profession can be compared with those in another profession. The educational interventions implemented to achieve and maintain competence will 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 will be achieved due to standards that permit the sharing of content and comparison of outcomes data.

Comparison of training programs across health professions will 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 by 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 that the data will lose value when brought together.

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

When performing continuous quality improvement or preparing for accreditation, data will 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.

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 to advance 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, with target completion in 2022.
- 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 MedBiquitous Implementation Subcommittee.
- On an ongoing basis, the Institute of Electrical and Electronics Engineers (IEEE) and other standards relevant to health professions education and credentialing will be identified for inclusion in the MedBiquitous 2030 recommendations by the MedBiquitous 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 steps 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.

MedBiquitous 2030: Proposed Road Map

Planning Phase

In the first half of 2022, a working group will be created by the MedBiquitous Steering Committee and its subcommittees. The methods for execution and evaluation of the proposed plan for MedBiquitous 2030 will be the working group's primary focus. This group will serve as the hub for any other work related to the initiative.

The target for publishing these methods is the first half of 2022.

Research and Alignment Phase

Using 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 July 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 ongoing.

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 ongoing.

Join Us

Join us as we begin this journey toward the year 2030. In the coming years, our world will continue to change and evolve; however, one thing remains true: For us to collectively achieve our goals, we must work together. That is a core value of the MedBiquitous community. The members of this community are dedicated to the advancement of health professions education and credentialing by developing and curating the resources necessary to realize our digital future.

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[1] Boston Consulting Group. Digital ecosystems. https://www.bcg.com/capabilities/digital-technology-data/digital-ecosystems. Accessed March 25, 2021.

This document has been endorsed by the MedBiquitous Steering Committee. All content reflects the views of the committee and does not reflect the official position or policy of the AAMC unless clearly specified.