

**PHPM 631 Assignment 3: Interoperability**

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## **Executive Summary**

Interoperability in healthcare is an important focus for improving patient safety and quality of care. Interoperability allows health information systems to communicate data with each other and ultimately provide meaningful information to users. Sharing this information has many benefits, but there are costs associated with it. These costs have led to many barriers in full implementation of interoperability. Some of these include issues with financial incentives, trust, and lack of cohesive standards. Despite this, several advancements have been made including fully interoperable systems in large regions throughout the world, but there is still much to do. Currently, many IT developers and healthcare systems are developing tools that promote interoperability among electronic medical systems in the US. One day, healthcare systems will likely overcome the barriers to interoperability, and hopefully, that day will be soon. Until then, work towards full interoperability in healthcare will continue.

## **Main Report**

Interoperability is a vital aspect of improving health information management technology. According to the Healthcare Information Management Systems Society:

Interoperability is the ability of different information systems, devices or applications to connect, in a coordinated manner, within and across organizational boundaries to access, exchange and cooperatively use data amongst stakeholders, with the goal of optimizing the health of individuals and populations. (HIMSS, 2019)

Interoperability is essentially concerned with the vast area of computerized systems within and between different industries and their ability to exchange and interpret data. Increased levels of

interoperability lead to increased quality of care as patients obtain greater control of their health care information and processes are made more efficient (Continuum, 2018).

Information exchange within and between organizations takes place at varying levels of interoperability. These exchanges fit one of four categories listed in order of increasing complexity: foundational, structural, semantic, and organizational (HIMSS, 2019). Foundational interoperability is important for forming the initial basis of information exchange between information systems by establishing inter-connectivity requirements. However, this does not mean that the receiving system can interpret the data (HIMSS, 2019). Structural interoperability is defined by the standardization of data passed between information systems. Data may be interpreted at the individual field level, but ultimately remains unaltered (Continuum, 2018). Semantic interoperability is defined by multiple systems' ability to communicate via data exchange, data interpretation, and individual system use of said data (Continuum, 2018). Organizational interoperability includes the technical aspects of the previous levels of interoperability, and includes policy, social, and organizational components. These additional components ensure secure, seamless, and timely exchange and use of data to increase cooperative efforts for positive patient outcomes (HIMSS, 2019). Interoperability will function at its best when these four levels work together seamlessly.

Although interoperability is a necessary aspect for any information system, it is especially important for healthcare information systems as it can affect patient safety and quality of care. Concerns with interoperability in healthcare have been around since the birth of health information technology. For decades, a focus on standardization has been heralded as a means by which to obtain interoperability (Gritzalis, 2009). However, barriers have constantly prevented

full interoperability. Challenges in the political arena, difficulty between operating systems that were implemented over a series of decades, monetary costs, and more have prevented interoperability (Barbarito, F., et al., 2012). Some have even gone so far as to call interoperability “the Tower of Babel of healthcare systems” (Interoperability in Healthcare Systems, 2017).

Barriers to interoperability include Health Information Blocking, which is purposeful blocking of health information by providers and other IT companies (Shah, n.d.). Some doctors, especially in the private sector, think that interoperability will hurt their competitive advantage as a business. Unfortunately, these professionals are not considering the potential increased quality of healthcare (Shah, n.d.).

Financial barriers also stunt the growth of interoperability. Interoperability frequently requires providers to purchase the latest technology. If they are unable to purchase these systems and add-ons, then interoperability becomes more difficult to achieve (Cohen, 2019). Until recently, CMS offered little to no financial incentive to move towards interoperability. With the dawn of value-based care, interoperability is beginning to be financially rewarded as providers try to move away from duplicating tests and move towards better communication about a patient’s health. Until more incentives come, though, interoperability will continue to be a slow process (Cohen, 2019).

Trust is another factor that has slowed the movement towards full interoperability. Providers question if the technology that allows electronic health records (EHRs) to communicate with one another is secure and HIPAA-compliant (Cohen, 2019). In addition, the movement towards interoperability can be burdensome on a system. Once providers venture out

and start using interoperable systems, they realize that some reporting requirements are too stringent on their business (Cohen, 2019). For example, some quality metrics that providers must report on under MACRA (Medicare Access & CHIP Reauthorization Act) may have nothing to do with their speciality but still have to put in the work to make sure they meet those reporting requirements. Thus, interoperability becomes burdensome on providers and their staff, which affects their ability to achieve lower cost and higher quality care overall.

Despite constant barriers, some look at interoperability optimistically and believe it is possible to one day achieve full interoperability within healthcare systems. Some believe regional interoperability may be the first step in achieving this goal. The Lombardy Region in Italy achieved regional interoperability via the Regional Social and Healthcare Information System (Barbarito, F., et al., 2012). This system is available to all the individuals in a region of approximately 10 million citizens. It provides “full access to clinical and health-related documents independently from the healthcare organization that generated the document itself” (Barbarito, F., et al. 2012). As of 2012, the system managed “4,700,000 pharmacological e-prescriptions, [and] 1,700,000 e-prescriptions for laboratory exams per month” (Barbarito, F., et al., 2012). In addition, the system generated 490,000 laboratory reports, 180,000 radiology reports, 180,000 first aid reports, and 58,000 discharge summaries each month (Barbarito, F., et al., 2012). Systems like the one in Lombardy show that interoperability on a large scale is possible, but stakeholders must invest to create infrastructure and a legal framework to allow this to happen.

Another success story of interoperability is the Unified Health Record in Mexico City, Mexico. Thirty hospitals, who serve a total of 4 million individuals in the city, worked together

to create the Medical Administration and Hospital Administration System (SAMH) (Interoperability in Healthcare Systems, 2017). Within two years, the project took the health data of millions and allowed it to be immediately accessed in any of the hospitals. This has already allowed for a decrease in duplicate tests and an increase in overall savings (Interoperability in Healthcare Systems, 2017).

Unfortunately, while systems like these thrive in the area of interoperability, hospitals in the United States struggle. In order to reach interoperability, a system must thrive in four metrics: “data integration, reception, distribution, and finding” (Castillo, 2018). A 2017 report stated that only 29.7% of U.S. hospitals were able to meet these metrics (Holmgren, Patel, & Adler-Milstein, 2017).

To combat this, EHR vendors in the United States have focused on creating technology to allow their systems to communicate with one another. One example of this is PMP AWARe, which is an add-on to almost any EHR system. This add-on can exchange data between different EHRs and allows providers to look up medications that their patients have been prescribed (AWARe, 2019). AWARe allows one EHR to automatically interact with other EHRs to look up a patient’s prescription medications (AWARe, 2019). This information becomes available to providers, who can then accept the information into their own system (AWARe, 2019). This technology is being developed over time and is working towards greater interoperability amongst EHRs. Through add-ons like this, providers can make more informed care decisions for their patients.

Thankfully, in an era focused on value-based care, the idea of interoperability is becoming more important for hospitals to consider (Castillo, 2018). In the U.S., paper records,

which were once the standard, have largely been replaced by electronic health records, which allow for the electronic exchange of information (Park, 2014). Now, individuals in the field face the problem of forcing systems that have been developed over different periods of time and different operating systems to “speak” to each other and provide meaningful data to consumers (Park, 2014).

Some standards have been established. For example, HL7 V2.X and HL7 V3 were established so “demographic, clinical, and administrative data” could be shared among a variety of systems (Interoperability in Healthcare Systems, 2017). DICOM allows diagnostic imaging to be shared across a variety of platforms (Interoperability in Healthcare Systems, 2017). ASC-X12 has allows “procedures, patient eligibility, and benefit payments” (Interoperability in Healthcare Systems, 2017) to be shared. Other areas of interoperability that have established standards include codes such as ICD-10, which relates to diagnoses and procedures for billing (Interoperability in Healthcare Systems, 2017). SNOMED CT permits a standardization of biomedical concepts and clinical expressions (Interoperability in Healthcare Systems, 2017).

Overall, the United States healthcare system is on the cusp of creating a better healthcare experience for patients. Interoperability plays a vital role in this. In the quest for interoperability, much has been overcome. However, as companies and individuals work to obtain and perfect interoperability, more challenges are sure to emerge. Like all challenges, these will be overcome so that providers can create a more interoperable system that will benefit the wellbeing of all.

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## Appendices