

# **Health Information Technologies' Influence on Healthcare Professionals and Society**

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On my honor as a University Student, I have neither given nor received unauthorized aid  
on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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It is important to examine how kidney transplant coordination systems, which is how transplant coordinators organize kidney donations, will affect the interactions in organ transplant services. The technical project's goal is to implement the prototype for a kidney transplant management system to ease communications between different healthcare professionals as well as patients and to provide organized information. While working on the technical project, questions of how doctors communicate with their patients and other healthcare professionals. Within medical institutions, several healthcare professionals are communicating with each other, whether it discusses treatment options or patient health. Healthcare providers between medical institutions also need to exchange information with each other if patients need to go to other hospitals or if updated information on diseases and treatments needs to be quickly passed. Thus, the STS research focused on how advanced technology has affected communication/interactions between doctors, healthcare workers, coordinators, and patients. The technical and STS projects are both connected this way. The technical project focuses on developing one kind of organ transplant healthcare information system to assist coordinators, doctors, and patients while the STS project examines how healthcare information systems play a role in communication.

The technical project entails implementing a kidney management system that automated visualization and tracking for coordinators and patients to utilize. The system provides visualization on deceased-donor waitlist information while prioritizing those who have been on the waitlist longest. It also utilizes a relational database to store information via tables on patients and coordinators, allowing for efficient information accessibility and retrievals. The main feature that is the focus of the project is the visualization of a patient waitlist. Coordinators can view the waitlisted patients they are responsible for and track their attendance in appointments ensuring that patients are following routine tests. Formatting and prioritizing the information coordinators

want to view will be enhanced while allowing them to measily access more detailed information on a specific patient or test. Both coordinators and patients can log in and access the information needed in a secure manner that requires authentication as dictated by the Health Insurance Portability and Accountability Act (HIPAA). HIPAA sets a standard of protection of patient data to prevent their data from being released without their consent. The system will bring a clean and organized user interface and user experience to offer both patients and healthcare professionals refined communication and information accessibility.

Medical mistrust has affected vaccination efforts for Covid-19, creating tension when enforcing mask mandates and following guidelines recommended by healthcare professionals. This example of mistrust between healthcare workers as well as their patients shows how the rise of healthcare information technologies has changed their dynamics. The research question is how is the current way of technology used for communication between healthcare professionals as well as their patients, and what are the issues affecting better communication? To better understand the socio-technical dynamics behind HIT, the Interactive Sociotechnical Analysis (ISTA) model developed by Harrison et al. (2007) assists in the analysis of these relations. The research will analyze the feedback loops portrayed in interactions and unintended consequences between social groups with introductions to new healthcare technologies. Through research on historical trends and significant issues related to actors in the healthcare system, a pattern of issues or relationships on the influence of technology on healthcare workers and their patients over the development of technology could be revealed. These results will provide insight on design and usability aspects of healthcare technologies that engineers should consider and technology's role in communication in healthcare that future STS researchers should explore.

Both the technical and STS topics were closely interrelated with each other and each topic impacted how the other was approached. An awareness of the considerations in the features and usability of the technical project once understanding the issues healthcare providers have with current healthcare information technologies and factored these problems when developing the features for the organ transplant information system. Likewise, working on the project encouraged deliberation on the potential issues that the transplant information system could have and the broader scope of issues. Not only did the effects of the prototype system need to be considered, but concerns with various issues with usability and scaling also came up and provided for a more unique perspective on the paper. Working on each project individually would not have yielded the same in-depth considerations for each one.