

Digitization of Surgical Flowsheets
(Technical Report)

Implementing an Electronic Medical Record System in Developing Nations
(STS Research Paper)

An Undergraduate Thesis Portfolio
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by

Mary Blankemeier

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Preface

Five billion people from disproportionately low- and middle-income countries cannot access safe, timely, and affordable surgical and anesthesia care.

How can Rwanda's surgical records be digitized to identify at-risk patients? The African Surgical Outcomes Study (ASOS) calculated a mortality rate twice the global average for surgical patients in Africa. The perioperative mortality rate (POMR) measures African surgical patients' risk for in-hospital postoperative mortality and severe complications. Digitized surgical flowsheets yield more useful surgical risk scores. To optimize the digitization process, the research team redesigned the digital upload process, building a mobile app that integrates scanning and uploading functions into one convenient and efficient step, reducing the number of devices and platforms needed for doctors and hospital staff to upload a flowsheet. Further improvements to the Scanning Apparatus for Remote Access (SARA) increased the quality, consistency, and exposure of scanned surgical records. With the new system, doctors can automatically convert past and future handwritten records to a digital format in an average of fifteen seconds per sheet. Checklists were built to fix broken parts, introduce a new user, and ensure continuity between all users in Rwanda's primary hospital.

How can the digitization of medical records in low and middle-income countries affect healthcare? By indicating EMR's social implications, the Interactive Sociotechnical Analysis (ISTA) framework can guide successful EMR. Experienced practitioners and implementers of EMR systems in low- and middle-income countries built on this foundation within their patient populations to improve their processes and care. In Bangladesh, a new health care organization is advocating EMR's value for patients, providers, and outcomes; in Rwanda, EMR's gave access to information in various locations striving towards analysis and risk calculation; in Guatemala,

the EMR's improved efficiency and collaboration of care; and in Liberia and Indonesia, the EMR led to more accurate diagnostic and treatment decisions. However, successful EMR requires significant resources to communicate EMR's purpose, implement it effectively, and continually support the infrastructure, people, and processes behind it. EMR is cost effective only when patient histories are used. EMR systems serve diverse goals from billing and guiding patient care, supporting and holding providers accountable for their work, and updating administration on patient procedures, outcomes, and costs.

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