User Personae for Health Information Exchange & Evaluation of ELEMREX™ Platform

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ABSTRACT

This study presents an evaluation of ELEMREX™ , a HIPAA-compliant, cloud-based medical referral platform designed to remove communication and technical barriers that can delay timely patient referrals and treatment. The goal of ELEMREX™ is to boost patient acquisition, increase physician revenue, and improve patient outcomes. Utilizing evidence-based tools and behavioral analytics, ELEMREX™ facilitates assessment and management by providers and partners. The platform enables access, exchange, and consultation of electronic health information securely, consolidating data regardless of format or source.

ELEMREX™ is developed by Actual HealthCare Solutions (AHS), a promising Health IT startup whose mission is to revolutionize healthcare solutions. AHS is a physician-founded organization that focuses on simulating the needs of real-world medical practices in a digital environment. It provides direct assistance to healthcare providers and patients by using a cloud-based system to manage their scattered personal health information.

HITLAB conducted Heuristic Evaluation of the ELEMREX™ platform, focusing on assessing its usability from the perspective of different user personae – a primary care physician, a patient, a specialist (surgeon), and an administrator. The evaluation considered specific use cases of interest to AHS and identified specific problems in the use of the platform for each of the personae.
Overall, the ELEMREX™ platform demonstrated commendable performance across a comprehensive set of heuristic standards, affirming its role as a cutting-edge solution in the realm of Health Information Exchange.

OBJECTIVES

- Understand and develop persona for target user types.
- Evaluate ELEMREX™ platform based on Jakob Nielsen's ten established heuristics for specific use cases of all target users.
- Provide feedback on the current functionality of the platform.
- Provide recommendations for future development.

STUDY METHODOLOGY

- A total of 4 expert reviews were conducted by 4 independent HITLAB researchers, each taking one user persona.
- This evaluation examined the typical user experience of the platforms from the perspective of a patient, physician, specialist, and an administrator.
- For an efficient expert review, usability professionals utilized knowledge of heuristic standards, coupled with their experience designing and testing platforms and applications, to walk through the platform in the shoes of a typical user.
- Researchers explored the design, layout, functionality, navigation, content, and examined areas where platform diverges from established standards or hampers the user experience.
- After each account type was set up, instructions for use were provided via the tutorial session with AHS, and subsequently a demonstration was performed using the ELEMREX™ platform.

Specialist Persona

Dr. Olivia Lee

Occupation: Orthopedic Surgeon
Age: 52

"As a surgeon, my goal is to improve my patients' quality of life by treating them with the latest techniques and technology. I'm committed to providing the best possible care and staying up-to-date with the latest research to achieve the best outcomes for my patients."

Background
Dr. Lee is an experienced orthopedic surgeon. She received her medical degree from Johns Hopkins School of Medicine and completed her residency in Orthopedic Surgery at the Hospital for Special Surgery in New York. Dr. Lee further gained expertise in treating a wide range of orthopedic conditions at the University of California. She currently serves as the Department Chair for Orthopedic Surgery at a large academic medical center in California, where she sees a mix of patients with various orthopedic conditions in addition to leading the department and managing its operations.

Personality
As a Department Chair of orthopedic surgery, Dr. Lee is committed to improving the quality of care provided by her department. She is dedicated to fostering a culture of excellence within her department, encouraging and supporting her team to achieve their full potential. Through her leadership, Dr. Lee strives to ensure that her department is at the forefront of orthopedic surgery, providing the highest level of care.

Daily Activities
- **Managing departmental administration:** Handle administrative matters and departmental operations.
- **Collaborating with healthcare professionals:** Work with other healthcare professionals, to ensure coordinated patient care and smooth departmental operations.
- **Reviewing patient cases:** Provide guidance and support to other surgeons on the team to ensure the best possible care is provided to each patient.
- **Engaging in research and academic activities:** Take part in research, presenting at conferences, and publishing papers in academic journals.
- **Interacting with hospital administration:** Dr. Lee collaborates with hospital administrators to ensure that the orthopedic surgery department is meeting the hospital's goals and objectives, and to secure resources and support for the department.

Motivations
1. Positive impact of her care on patients' lives and their gratitude for her dedication.
2. Professional growth.
3. Fulfillment in helping patients understand and manage their conditions, empowering them to take control of their health.

Frustrations
- **Time management:** Dr. Lee struggles to balance her schedule, administrative tasks, and patient care.
- **Patient communication:** Dr. Lee finds explaining complex medical concepts to patients challenging, leading to misunderstandings.
- **Referrals process:** Dr. Lee occasionally faces difficulties getting patient referrals with good insurance schemes.
- **Document management:** Dr. Lee is overwhelmed by paperwork, including patient charts, test results, and insurance forms. She finds it challenging to access critical patient data siloed in EMR databases and is unable to review referred patient EHR in advance due to HIPAA constraints.
- **Insurance and reimbursement:** Dr. Lee deals with time-consuming and frustrating insurance issues.

Goals
- Improve patient outcomes
- Streamline administrative tasks
- Enhance patient communication
- Improve referral process and increase revenue
- Advance the field of surgery: mentoring/coaching of primaries who require higher education assistance
- Minimize scheduling and data access delays to increase patient appointment conversion.

Administrator Persona

John Smith

Occupation: Department or Clinic/Practice administrator
Age: 40

"As a healthcare practice administrator, my ultimate goal is to create an environment where our staff and physicians can deliver the highest quality care to our patients, while also fostering a culture of collaboration and continuous improvement."

Background
John has worked in administration of clinics and practices for over 10 years and has extensive experience in managing an entire department, staff, finances, and resources. He holds a Master's degree in Healthcare Administration and has worked for both public and private clinics and medium sized practices.

Personality
John is a detail-oriented and analytical person, who is committed to delivering high-quality patient care while balancing the financial needs of the hospital. He is a strategic thinker, who likes to plan in advance, and hold discussions with the staff to achieve common goals. John values transparency, honesty, and open communication in his interactions with staff, physicians, and patients.
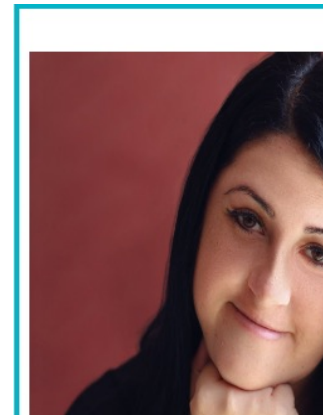
Daily Activities
John oversees and assists with managing events and facility operations, including but not limited to, staff schedules, setup and breakdown, cleaning and maintenance forms. He observe facility programs ensuring safety protocols, security procedures and equipment usage are properly maintained. He ensures clinic compliance with all regulatory agencies governing health care delivery and the rules of accrediting bodies. He works closely with the Director of Operations or the Clinic Medical Directors to ensure that expectations of the patients and providers are met.

Motivations
John is motivated by the opportunity to make a positive impact on patient care and to ensure that the clinic/practice is providing the best possible services to the community. He is passionate about healthcare and believes that effective administration is critical to improving patient outcomes and experiences.

Frustrations
- **Redundancy in administrative processes:** Frustration with the number of administrative processes that are required for the smooth functioning of a healthcare practice. Often, these processes are repetitive and time consuming.
- **Siloed information across departments:** Challenges in accessing important information related to patient care, hospital finances, and staff performance due to lack of integration between different departments. This can lead to a lack of coordination and communication between departments, resulting in inefficiencies and errors.
- **Inadequate communication:** Inadequate communication with staff and physicians lead to delays in decision-making, which can negatively impact patient care and clinic/practice operations.

Goals
John's goals include streamlining administrative processes, improving access to information, and enhancing communication channels through implementing new technologies. These goals are focused on reducing redundancy and improving efficiency, facilitating better collaboration and decision-making, and enhancing understanding and collaboration among staff, physicians, and administrative staff.

Primary Care Physician Persona

Dr. Henry Chambers

Occupation: Primary Care Physician
Age: 38

"I believe that every patient deserves the best possible care, and I am committed to providing that care with empathy, compassion, and professionalism."

Background
Dr. Chambers is a highly experienced primary care physician with over 10 years of experience in providing general medical care to patients. He completed his medical degree at a prestigious university and went on to complete his residency and fellowship in internal medicine. Dr. Chambers has worked in a variety of healthcare settings, including academic medical centers and private practices. He is passionate about providing the best possible care for his patients and is always looking for ways to improve his practice.

Personality
Dr. Chambers is empathetic and caring, and he takes the time to listen to his patients and understand their concerns. He is also analytical and detail-oriented, and he pays close attention to his patients' medical histories and symptoms to develop accurate diagnoses and treatment plans.

Daily Activities
- **Conducting consultations and examinations:** Dr. Chambers discusses medical concerns with patients and performs thorough assessments to identify health issues.
- **Reviewing charts and tests:** Dr. Chambers examines patients' records and post medical information to inform treatment decisions.
- **Diagnosing and treating conditions:** Dr. Chambers manages various health issues, like diabetes and hypertension, using evidence-based approaches.
- **Collaborating with healthcare professionals:** Dr. Chambers partners with specialists and nurse practitioners to provide multidisciplinary patient care.
- **Prescribing medications and coordinating with pharmacies:** Dr. Chambers prescribes appropriate medications and ensures their timely dispensing.
- **Providing preventive care:** Dr. Chambers promotes vaccinations, health screenings, and patient education to minimize future health complications.
- **Managing referrals and follow-up care:** Dr. Chambers connects patients with suitable specialists and coordinates follow-up care to monitor progress.

Motivations
1. **Personal fulfillment:** Dr. Chambers finds satisfaction in witnessing the positive impact of his care on patients' lives, motivating him to continue refining his practice.
2. **Professional growth:** Dr. Chambers is driven by the pursuit of knowledge and expertise, inspiring him to stay current with medical advancements and engage in professional development.
3. **Patient advocacy:** Dr. Chambers is motivated by his commitment to his patients' well-being and the desire to provide the best possible care tailored to their needs.

Frustrations
- Managing a large patient referral volume, resulting in longer wait times and reduced individual attention for each patient.
- Challenges in effectively coordinating patient care with other healthcare providers, potentially leading to gaps and delays in treatment.
- Technology flaws and inadequate IT infrastructure hindering connected and efficient healthcare.
- Time-consuming and frustrating process of obtaining HIPAA consent forms for referrals.
- Not enough processes to manage and follow-up on patient referrals.

Goals
- **Embrace technology:** Dr. Chambers aims to adopt new technologies to streamline processes, improve patient engagement, and enhance overall practice efficiency.
- **Pursue professional development:** Dr. Chambers aspires to balance his workload and continue his education, staying up-to-date with the latest research and advancements in internal medicine.
- **Strengthen referrals and follow-up care:** Dr. Chambers seeks to build trust with patients, enhancing their satisfaction and commitment to treatment plans.

Patient Persona

Mary Johnson

Occupation: High School Teacher
Age: 42

"I'm eager to learn and adapt to new technology, even if it takes me a little longer. I see the potential for it to improve my quality of life and keep me connected with my healthcare providers."

Background
Mary is a 42-year-old divorced woman who lives with her two children in an apartment in a housing estate building. She is a high school teacher and enjoys taking the time out to do fun activities with her children and balance her heavy - duty school workload. Mary has been diagnosed with chronic back pain making it difficult for her to do chores and finish physical tasks without pain. She also has Type 2 diabetes, which require her to take medication daily.

Personality
Mary is a balanced yet determined and resilient individual who is willing to adapt to new technology to improve her health and quality of life. At times, she may require assistance from others to navigate new digital healthcare tool but she is eager to learn and stay connected. Mary is compassionate and values open communication with her healthcare providers.

Daily Activities
Mary spends most of her days between school and home where she is teaching, interacting with students and other teachers, cooking for her family, watching TV leaving with little time to complete physical tasks and get exercise , but enjoys staying in touch with loved ones through phone calls and video chats.

Motivations
Mary is motivated by her desire to stay active and engaged in life. She enjoys spending time with her children and helping her students and colleagues on her teaching days. Mary is motivated to embrace new digital healthcare and use digital healthcare tools to better manage her time, health and access healthcare services.

Frustrations
- Lack of time and back pain management limitations affect Mary's daily life.
- Being a single mother, or others for assistance with some tasks and inability to physically complete tasks.
- Difficulty adapting to new technology, but Mary is willing to learn.
- Variable support from her primary care physician when seeking referrals to specialists.
- Lengthy wait times for referral appointments, which may be affected by insurance coverage.

Goals
Mary's primary goal is to maintain her independence and quality of life as much as possible despite her health issues. She wants to be able to continue going through her day effectively and remain healthy allowing time for exercise and socialisation.

The ELEMREX™ Difference

Secure Data Storage — a lock/key encrypted cloud-based, HIPAA-compliant system that eliminates the need to transfer medical data across the internet

Eliminates Multiple Searches — all patient data is aggregated in one place for multiple physicians' easy access

Reduces Data Exposure Risk — patented technology significantly reduces chances of patient data mismatch

Current Augmented Intelligence (AI)/Machine Learning features - verbal navigation, first of its kind AI self-updating comprehensive patient histories, AI assisted clinical documenting, AI radiology summary generation. Commercial release will incorporate AI scrubbed metadata analytics to continually update AHS's patented Medical Organic Digital Library (MODL).

RESULTS

ELEMREX™ Strengths	Instituted HITLAB Recommendations
The platform ensures users are consistently informed about ongoing processes with appropriate feedback presented within reasonable timeframes. This clarity enhances user confidence and understanding of the system's operations.	Offer concise guidance when physician names are unavailable, directing users to seamlessly add new physicians. Additionally, consider empowering users to edit contact details within their profiles, while granting administrators access to comprehensive activity logs
ELEMREX™ seamlessly integrates with users' mental models, adhering to real-world language, phrases, and conventions. This alignment enhances user comfort and reduces the learning curve associated with adopting new technology.	Incorporate AHS HIPAA forms for users to review and sign, with provisions for updates. It's essential that prompts prioritize the addition of doctors, followed by displaying editable demographics. Finally, ensure a confirmation step for granting access to newly added physicians.
The platform empowers users with control and freedom through features like an "emergency exit" and undo/redo options, enabling confident navigation and quick error correction.	To enhance security measures, consider implementing automatic user logouts after 15 minutes of inactivity. Additionally, it's imperative to address any non-functioning options, such as adding data or progressing to the next page, as they are vital for seamless functionality.
ELEMREX™ prioritizes careful design to prevent errors, presenting plain-language messages that pinpoint issues and suggest constructive solutions, reducing user frustration and enhancing usability.	It's recommended that the platform swiftly updates to reflect changes, displays patient emails lacking physician response, and provide indications for inaccessible physicians in the drop-down menu.
The platform minimizes users' memory load by prioritizing recognition over recall and offering ease of navigation. This design choice reduces cognitive burden and enhances user efficiency. ELEMREX™ employs minimalist design, prioritizing relevant information to minimize distractions and enhance visibility.	Ensure clarity regarding the identity of the super administrator for seamless contact, enable manual changes to documents, and provide clear notifications to other users about tasks exclusive to the super administrator through pop-up notifications
The platform ensures users have access to easily searchable, task-focused, and concise information to enhance self-sufficiency.	The platform could benefit from enhancements such as a search function, additional help resources and a superadmin chat feature.

CONCLUSIONS

As a result, ELEMREX™ highly aligns with industry-accepted heuristic standards, affirming AHS's commitment to delivering a user-centric experience.

- Overall, HITLAB's recommendations helped improve the usability of ELEMREX™ platform to a great extent.
- AHS worked on all HITLAB recommendations and improved functionality of the platform wherever possible in the current state of development.

HITLAB

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