Applying User Experience Journey Mapping to the Modernization of VHA Health Information Technology Solutions

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Background & Objective

Journey maps are a type of alignment diagram that allow for visual representation of different aspects of an experience in a grid-like display for easy comparison and analysis. Aspects of the experience (such as tasks/activities, emotional state, activities shared with other people, health information technology (HIT) tools used, data standards employed, etc.) are aligned vertically along a chronological timeline so that relationships between the different aspects can be easily identified and compared throughout the entire experience. [1]

The objective of this project was to visualize a series of outpatient clinical encounters from the perspectives of three different people. In this manner, the team hoped to identify innovative solutions to pain points that would produce the best experience for all individuals involved. Providing this information to development teams and executive decision makers can help them understand how opportunities or compromises in Health Information Technology (HIT) investment could affect the vision of the ideal to-be experience, specifically the prioritization of the modernization of VA's Electronic Health Record (EHR).

Methods

This project employed literature consultation, rapid ethnography, interviews and unmoderated questionnaires to collect qualitative information. This qualitative information was used to produce a rich narrative of the storyline, which was reviewed by clinical Subject Matter Experts (SMEs). Supporting information for each event, including touchpoints, was collected or generated and then visualized in the form of journey maps.

The team produced a coordinated package of maps of the experiences of three people (represented as validated personas). All maps depicted the same health need for one Veteran patient and mapped her perspective along with that of two VHA staff members involved in delivering her care.

1. **Meghan**: Post-9/11 female Veteran experiencing the early pregnancy of her third child with her new husband, who is active duty Navy. The journey is triggered with the pregnancy diagnosis and proceeds through the resolution of a teratogenic drug issue resulting in a seizure at approximately 8 weeks post-conception.
2. **Dr. Francis**: Meghan's Primary Care Provider.
3. **Vera, RN**: Meghan's Maternity Care Coordinator.

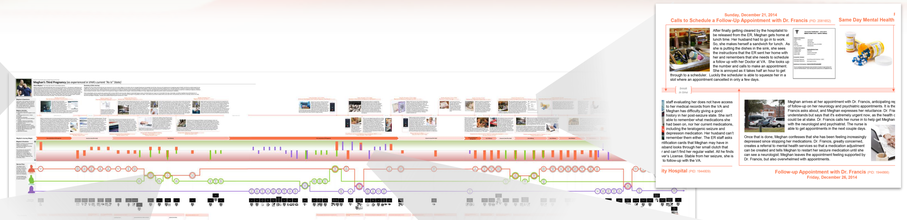
The package contained 6 maps. Each person's journey was mapped to show their experience in VA's current **"as-is" state** with their experience in a future envisioned **"to-be" state**, along with the supporting HIT resources for both.

Results

The development of the "as-is" journey maps identified dozens of touchpoints that demonstrate opportunities for innovative improvements to the overall experience of clinical outpatient encounters, for both Veterans and their providers. These opportunities were used to develop the future envisioned "to-be" state, including application of innovative ideas to design excellent experiences for both Veterans and those who support their care, while also engaging Veterans as active members of their own care teams.

Center the Journey on the Persona

A persona is a specific individual (but not a real person) who represents the needs and expectations of a larger group. Our personas were developed based on a data collection effort and then validated with users that they are meant to represent. [2] In this way, our personas form an "empathetic bridge" between software development teams and end users. They enable everyone to make decisions that produce the best user experience possible. In our journey mapping effort, each map is developed for a single persona and shows how the personas interact with each other in the total experience.

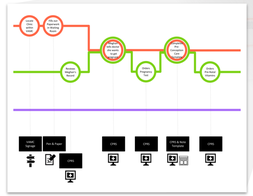


Visualize the Narrative

Each persona experiences both individual and shared events. These events are conveyed in the form of a rich narrative providing context for the individual's experience. On the map, they are represented using chronological photos and/or HIT system screenshots placed on a timeline.
The events in this narrative are told from Meghan's perspective, using words that represent how she might tell this story. Events shared with Dr. Francis or Vera are also told from their perspectives in corresponding journey maps. Standardized timelines with identical breaks across all maps allow for simple comparison of maps across personas to understand and/or compare experiences from different perspectives.

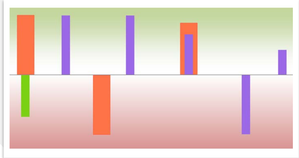
Visualize Service Flow of the Touchpoints

Depicted as a "transit style" diagram, this visualization shows activity from each of the major contributors (people) to this story. Where activities are shared, these touchpoints are shown as overlapping. The diagram demonstrates overlap between persona experiences as the flow proceeds. It also indicates the HIT that they use or share to support the process steps. Technologies and services are indicated for each touchpoint by the plumb line dropped down to the designation of technologies used.



Visualize the Persona's Emotions

This column graph represents Meghan's emotions based on how pleasant (above the center line) or unpleasant (below the center line) her feelings are during each touchpoint. [3] Her emotions (presented in orange) are represented in contrast with the emotional experiences of her supporting VA Primary Care Provider (PCP) (Dr. Francis, presented in green) and VA Maternity Care Coordinator (MCC) (Vera, RN, presented in purple). This visualization makes it simple to identify where different personas experience the same events quite differently.



Applications for Journey Mapping as a "Package"

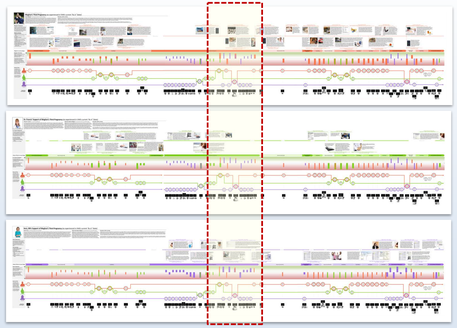
These maps will ensure that users are at the center of VA's organizational thinking as new Electronic Health Record (EHR) components are acquired, customized, built and/or integrated. All maps in the package are centered on the Veteran health need and the comprehensive Veteran experience through a series of diverse encounters. As such, the maps will continually encourage consideration and balance of users' questions and needs throughout decision making at all levels.

- Executives and other management can use the journey maps to identify potential infrastructure capabilities needed to deliver on the future vision and make more informed decisions on impacts associated with necessary compromises in funding specific HIT investments.
- HIT managers can use them to gain a more holistic view of the user experience, helping them to identify areas to improve and drive organizational impact.
- Software designers and developers can use them to gain perspective on the motivations and constraints of the users of their products, resulting in a stronger empathetic bond that can translate into better software design decisions and compromises. These teams can also use the maps to prioritize fixes or enhancements and plan the rollout of future HIT products or enhancements based on user needs.
- Teams can use the maps to help inform communications intended for users of the systems, as well as oversight bodies, such as Congress.

Understanding the Whole Journey with Multiple Persona Perspectives

When maps are paired to provide the perspectives of the variety of people experiencing the same series of events, opportunities and compromises can be more thoughtfully considered, while continually accelerating decision making and innovation.

In this example, the "as is" state maps for all three personas are aligned vertically to produce an even larger alignment diagram. In this way, specific areas can be explored to fully understand the experience from multiple perspectives. In this way, a designer can accommodate all sociotechnical aspects of the experience when preparing to propose a new solution that must support needs of all personas. [4] Here, the maps show how, while Meghan is celebrating her pregnancy, Dr. Francis is struggling with the challenges of her workload (which caused the delay in notifying Meghan), and Vera is anxiously digging through the electronic health record for the orders from Dr. Francis to assist Meghan in acquiring maternity care from a community provider.

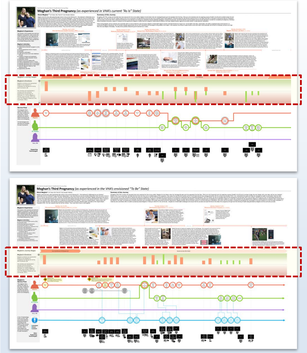


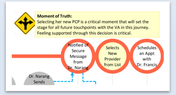
Designing a Better Experience

for Veterans AND their Providers

For each persona, the "as is" maps can be aligned with the "to be" maps to make comparisons for a variety of purposes. For example, the maps show "Moments of Truth" (MoT, presented as small yellow indicators on the service flow diagram). MoTs are critically charged touchpoints that have potential to significantly affect the experience of the individual over the journey as a whole (either positively or negatively). MoTs can be examined for opportunities that could be prioritized above others. [1]

Using MoTs, a new VA technology was envisioned for the "to be" state as a virtual assistant, lending the power of computing to the talents of the humans. It is presented as its own touchpoint service flow and demonstrates how the experience could be improved for Veterans and clinicians with changes in all aspects of clinical experiences, including policies, procedures and supporting HIT products (hardware and software investments). These improvements directly impact the overall pattern in emotions, which can be seen as more pleasant in the "to be" experience than in the "as is."





Conclusions & Next Steps

Journey maps are powerful tools to help put and keep the user at the center of organizational thinking. Journey maps of clinical scenarios done in "packages" can support prioritization of business process re-engineering needs, process improvement projects, and health information technology development.

This particular package of maps is being used for EHR Modernization prioritization activities. In support of this purpose, the following next steps are planned:

- All maps in the package will be validated with Veterans and clinicians/VHA employees.
- For each major event, activity or touchpoint area of the map, supporting data standards and/or clinical decision support data sources are identified. We plan to use this information to identify the high-priority interoperability requirements. This can be done by providing implementation guidance on representing patient notifications, reminders, patient-generated information using FHIR Communication, Patient, Questionnaire Response, etc. based on the content of the journey maps. [5]
- Maps in this package will be used to inform HIT requirements for generalizable encounters included in the storyline (such as primary care appointments, mental health appointments, etc.). Packages with other Veteran personas are planned to expand to other generalizable clinical encounters (such as suicide intervention, inpatient care, etc.).

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Footnotes & References

[1] The concept of a journey map as an alignment diagram and the uses as such, are defined in Kalbach's book, "Mapping Experiences." Kalbach, J. (2016). Mapping Experiences (First). O'Reilly Media, Inc.
[2] VA Human Factors Engineering (HFE) produced a poster for the 2015 Human Factors Engineering Health Care Symposium outlining the process for creating the personas. Kabel, M., Cook, A., Brown, J., Robbins, J., & Noonan, A. (2015). FACT not FICTION : Building Evidence Based Personas at VHA. In Human Factors and Ergonomics in Health Care Symposium. Retrieved from https://www.hfes.org//Web/HFESMeetings/Fact Not Fiction- Building Evidence-Based Personas at VHA.pdf
[3] VA HFE used a psychological model of emotions to quantify the emotions used in the visualization of personas emotions. Our team decided to use a model in order to offset the elusive nature of emotions and the ambiguity of natural language surrounding emotions. Our team selected the Hourglass of Emotions as a model, as it is presented for affective human computer interaction. The authors propose the model to potentially synthesize the full range of emotional experiences in terms of "Pleasantness", "Attention", "Sensitivity" and "Aptitude." For this journey map, our team selected the scale for "Pleasantness." Cambria, E., Livingstone, A., & Hussain, A. (2012). The hourglass of emotions. Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 7403 LNCS, 144–157. https://doi.org/10.1007/978-3-642-34584-5_11
[4] Systems Engineering Initiative for Patient Safety (SEIPS) model of work system and patient safety provides a framework for understanding the structures, processes and outcomes in health care and their relationships. Using this model, our team approaches human factors engineering activities, including journey mapping, in a more holistic manner. Carayon, P., Wetterneck, T. B., Rivera-Rodriguez, A. J., Schoofs Hundt, A., Hoonakker, P., Holden, R., & Gurses, A. P. (2014). Human factors systems approach to healthcare quality and patient safety. Applied Ergonomics, 45(1), 14–25. https://doi.org/10.1016/j.apergo.2013.04.023
[5] Our team is mapping a variety of standards to the journey maps, including the Fast Healthcare Interoperability Resources (FHIR), a next generation standards framework created by HL7. Health Level Seven. (2017). Fast Healthcare Interoperability Resources (FHIR). Retrieved July 10, 2017, from http://hl7.org/fhir/