

Introduction

- Many digital health technologies, including the Electronic Health Record (EHR) originate from a **mechanistic isolationist** characterization of workflow.
- The combination of a mechanistic view and the rapid implementation of the EHR yielded **unintended consequences (UCs) and negative user experiences (UX)**.
- Description of nurses' experiences with UC is underdeveloped.
- UCs include technology-induced errors, unfavorable workarounds, additional work, and technology overdependence that hamper situational awareness and impact decision-making.

Purpose

To describe the synthesis of concepts from Task-Technology Fit[1] theory and the Technology Acceptance Model [2] to derive a new, synthesized framework that addresses antecedents and outcomes of nurses' UX.

Method

- The User Experience to Adoption (UXA) conceptual framework was formulated using **Walker and Avant's Theory Synthesis** [3] method.
- It builds on **empirical evidence from nursing studies on UX from 2008-2018**.
- Byproduct of the initial evidence from a comprehensive literature review.
- We pulled together available information about nurses' UX with the EHR and organized the different concepts and statements to represent UX and technology adoption.

Results

- In the UXA Framework (Figure 1), **UX is a precursor** to actual system use which is aligned with the construct of adoption.
- Actual system use is derived from **the fit among task, technology, individual, and organizational characteristics**.
 - Task characteristics:** documentation demands, non-functional data entry requirements, task switching, regulatory impact, and information access.
 - Technology characteristics:** hardware, software, and environmental design factors.
 - Individual characteristics:** computer attitudes, skills, literacy, age, clinical experience, training, and previous experience with EHR.
 - Organizational characteristics:** users' input to design, authentic leadership, organizational support and communication, work setting, and work shifts.
- The model depicts the **multi-dimensional outcomes of UX**. This interplay impacts **UX consequences**
- UX** categorized across multiple dimensions:
 - Functional:** Interruptions due to suboptimal design, substandard functions, data entry requirements.
 - Physical:** Use and accessibility, hardware-related.
 - Perceptual:** Human-computer interaction, usability, reliability, customization.
 - Cognitive:** Workload and workarounds
 - Psychological:** Satisfaction, documentation time.
 - Social:** Communication changes, organizational culture.



- In this framework, **actual system** use is **mediated by user intention** and **influenced by UX consequences**.
- Testing of the framework is underway.**
 - Data mining to describe nurses' task characteristics as measured by nurses' EHR navigation patterns.
 - Regression analysis to quantify the relationship between the antecedents and outcomes of user experience.
 - Measurements:
 - Technology characteristics by the preferences and settings for individual nurses roles.
 - Individual characteristics by nurses' demographic information.
 - Organizational characteristics using the nurses' hospital site.
 - Cognitive dimension using time spent in the EHR and cognitive workload using NASA-TLX.

Conclusion

- The UXA framework can be used in a wide variety of practical applications including describing the antecedents and consequences of UX with the EHR.
- It can be used to design interventions to prevent unintended consequences and to identify factors for assessing meaningful use and adoption of EHR.
- The framework may have applicability to other technologies beyond the use of the EHR.

References

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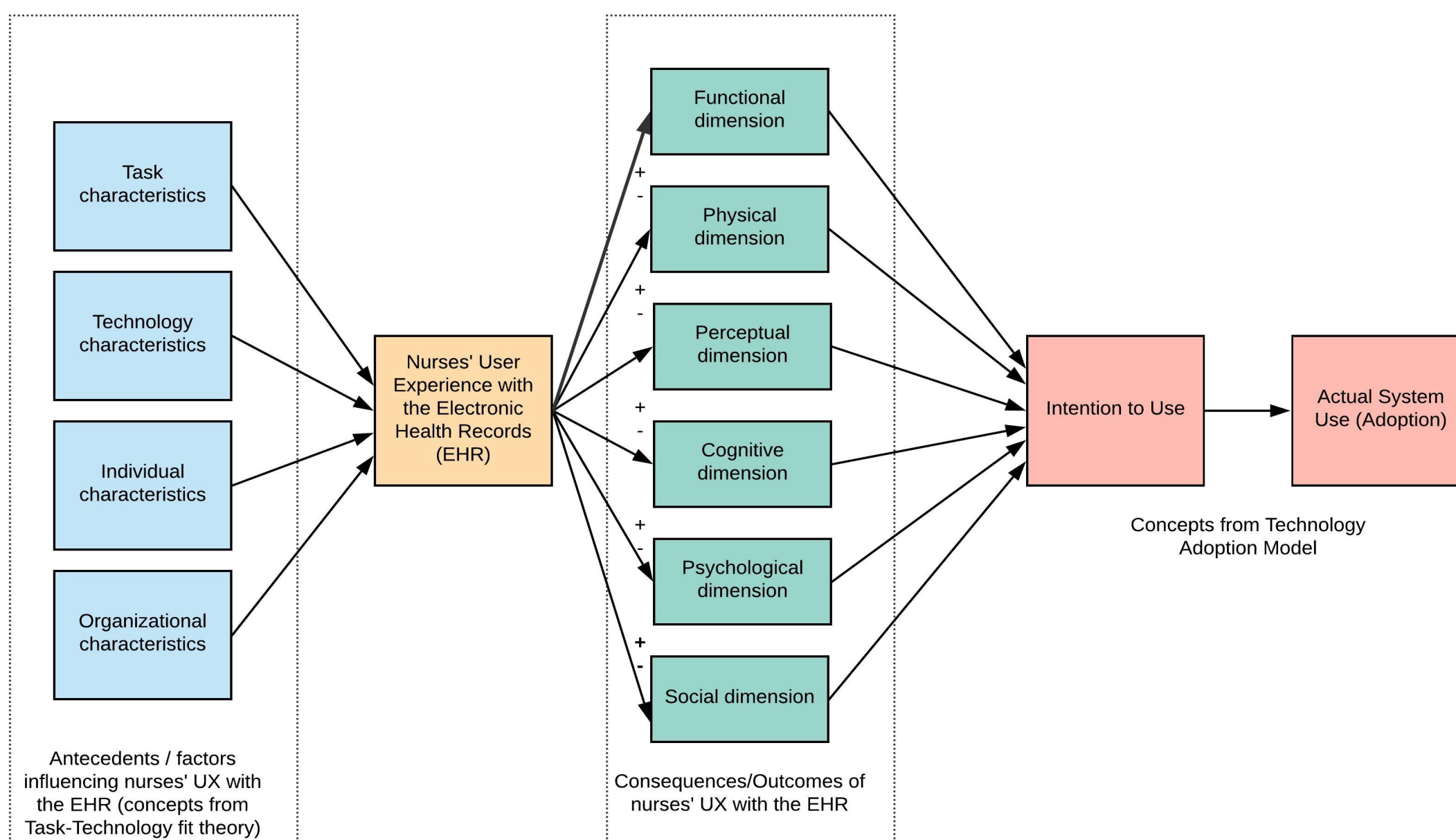


Figure 1: Proposed Framework on User Experience to Digital Health Use