Nurse Informaticists: Bringing value throughout the product life cycle of mHealth apps

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Meet Our Speakers

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Conflict of Interest

Melissa Serna Breth, DNP, RN-BC, CPHIMS

• has no real or apparent conflicts of interest to report.
Conflict of Interest

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The model used to create a pediatric asthma application will be discussed in this presentation. The mHealth application is not on the market and is in testing phase. Therefore, there is no financial conflict of interest to report.

The discussion about the product will be limited to the development process and not the mHealth application itself.
Agenda

• Introduction
• Consult Current Literature
• In the Industry...
• mHealth Development Dream Team
• Get Involved
Learning Objectives

- Discuss at least 2 examples of development approaches to mHealth applications
- Describe at least 2 benefits of integrating nurse informaticists into the product life cycle of mHealth technology
- List 3 roles that nurse informaticists can fulfill throughout the mobile health app product life cycle
Nurse Informaticists: Bringing value throughout the product life cycle of mHealth apps

Nursing Knowledge: Big Data Science Initiative

Mobile Health for Nursing Workgroup
Look back at nursing informatics history...

Introduction of the Electronic Health Record

- **Focus:**
  - Adoption, Workflow, Usability, Change Management
  - Verification and validation

- **Continued work:**
  - Coding terminology, standardization
  - Retrofitting for interoperability

Nurses should have been at the table to contribute to the design...
Product Life Cycle of Software (mHealth)
Consult Current Literature
What does current literature show?

Scoping Review

• Since Jan 2021, a working group interested in mHealth asked, "How does the literature describe the role of the nurse in mHealth app life cycles?"

• After clarifying terms, 14 databases were searched: CINAHL, Cochrane, Compendex, Education Source, Embase, ERIC, Global Index Medicus, Google Scholar, IEEE Xplore, Medline, PsycINFO, PubMed, Scopus, and Web of Science.

• All literature was screened in stages by two independent screeners using Rayyan Intelligent Systematic Review.

• Preliminary results indicate ~189 articles describe the role of the nurse during the initial stages of the product lifecycle.
Preliminary Findings from the Literature

Themes

- Nurses are mostly involved in the deployment and testing of apps.
- Apps created for nurses or to teach healthcare professionals rely on nurses for content subject matter expertise.
- IEEE literature omits nurses or nurse informaticists in the planning, requirements, design, and development stages, especially for patients and consumers products.
In the Industry...
How are mobile apps developed today?

Mental Health and Wellness App

• Commercially available, dynamic app

• Developed with subject matter experts from the mental health industry
  • Psychiatrists, Psychologists, Therapists, and others

• Rooted in cognitive behavioral therapy (CBT)

• No nurses involved in the development of the app, but potential to explore involving nurse practitioners in the future
How are mobile apps developed today?

**Pediatric Asthma Self-Management App**

- Developed by an interdisciplinary team including nurse informaticists, subject matter expert, graphic & instructional designer, programmer, systems engineer.

- Used agile systems XP approach with intervention mapping protocol (Bartholomew) with a SIMILAR process

- Participatory action approach to engage end users (school nurses, families, children, providers)

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How are mobile apps developed today?

Children with Diabetes App

- Used a scrum agile approach based on discussion
- Conducted focus groups with children and parents during the planning stage to determine functions and features needed
- Team is interdisciplinary based on authorship of article but heavily directed by physicians (nurses, physicians, media and communication)

Image from: https://www.tuleap.org/agile/agile-scrum-in-10-minutes/

### Agile Systems Approaches

<table>
<thead>
<tr>
<th>User-Centered</th>
<th>Iterative</th>
<th>Instruction Design</th>
<th>Systems Life Cycle</th>
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<tbody>
<tr>
<td>Scrum</td>
<td>XP</td>
<td>Lean</td>
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<td>Spiral</td>
<td>V Model</td>
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<td>Kanban</td>
<td>FDD</td>
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<td>Waterfall</td>
<td>Crystal</td>
<td>ASD</td>
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### References:

ScienceSoft: [https://www.scnsoft.com/blog/software-development-models](https://www.scnsoft.com/blog/software-development-models)


# How are mobile apps developed today?

<table>
<thead>
<tr>
<th>Iterative &amp; Incremental</th>
<th>Sequential</th>
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<tbody>
<tr>
<td>Reflects stages of development</td>
<td>Rapid to a prototype</td>
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<tr>
<td>Feedback from end users throughout process</td>
<td>End users evaluate the completed prototype</td>
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<tr>
<td>Takes longer to develop</td>
<td>May require extensive revisions</td>
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<tr>
<td>Feedback for content, functionality, usability, scalability, interoperability</td>
<td>Non-cooperative with customer or end-user</td>
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<td>More time spent planning than coding &amp; testing</td>
<td>Testing rushed and costly to fix</td>
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mHealth Development Dream Team

Nurse Informaticists: Bringing value throughout the product life cycle of mHealth apps.
Roles of Nurse Informaticists

7 Operations and Maintenance
Distributor of updates; Optimizer; Customer Informant

1 Planning
Innovator; Program Manager; Consultant for the big picture

6 Deployment
Project Manager; Workflow Designer; Trainer & Educator; Support

2 Requirements
Subject Matter Expert; Advocate for:
- Standards,
- Scalability,
- Functionality,
- Feasibility

5 Testing
Project Manager; Usability Expert; Subject Matter Expert

3 Design and Prototyping
Standards Advocate; Patient & Consumer Representative; User-Centered Design Expert

4 Software Development
Development Design and Model Controller

What We Do
Get Involved!
How to Get Involved…

• Investigate Funding Agencies
  • Find out who’s received mHealth awards / grants
    • i.e. National Institutes of Health, NSF-Smart and Connected Health, Robert Wood Johnson Foundation

• Conduct a Literature Search
  • Who’s frequently publishing about mobile health app development?
    • → Reach out and connect with him / her

• Google it…use a web search engine like Google or Bing
  • Look up “mobile health developer”
    • → Cold call. “I’m really interested….how can I help?”

• Get involved with a group – a working group!
How to Get Involved…

Join
• MHealth workgroup
• Forum
• Special Interest Groups

Talk It Up
• Presentations, white papers, social media, publications, press releases, software development industry

Create
• Best Practices
• Evidence of nurse informaticists involvement
• Create groundswell, a movement
  • Get involved to get selected!

Join us!
Nurses for mHealth
Questions

Thank you!

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