Where Imaging and Clinical Informatics Meet: Software Development Life Cycle Methodologies & Terminology Review: Waterfall, Spiral, and Agile Approaches Applied to Use Cases

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Background/Problem Being Solved

The Certified Imaging Informatics Professional (CIIP) certification provides a foundational understanding of clinical informatics (CI), but practical applications often involve complex software development life cycle (SDLC) methodologies. Imaging informatics professionals may encounter terms like Waterfall, Extreme Programming (XP), scrum, spiral, or agile methods, which are not deeply covered in the CIIP curriculum, leading to challenges in selecting the appropriate approach.

Intervention(s)

This article introduces SDLC basics to burgeoning imaging informatics professionals, focusing on methodologies such as Waterfall, scrum, spiral, and agile. Key terminologies like Product Owner, Scrum Master, Sprint, and Daily Scrum are explained. Use cases from various institutions highlight the importance of engaging radiology and clinical stakeholders early in the process to ensure successful product development or procurement.

Barriers/Challenges

A critical barrier is poorly defined user requirements at project onset, leading to costly "scope creep" and resource wastage. Success depends on clearly defined project scopes and active involvement of all stakeholders, including PACS and EI administrators, to prevent costly delays and misaligned project goals. Additionally, a lack of familiarity with SDLC methodologies and terminology can negatively impact project outcomes.

Outcome

The article offers a comparative overview of software development methodologies, supplemented by real-world use cases. For example, one center's agile training enabled rapid development with participants assuming scrum master roles, while another leveraged grassroots development to integrate protocoling into a RIS vendor system. These experiences illustrate practical applications of SDLC approaches in imaging informatics.

Conclusion/Statement of Impact/Lessons Learned

Providing SDLC terminology and reviewing methodologies equips imaging informatics professionals with critical baseline knowledge. Sharing experiences from diverse institutions highlights practical challenges and strategies, preparing CIIPs to navigate the complexities of clinical informatics from their first day on the job.

Figure(s)

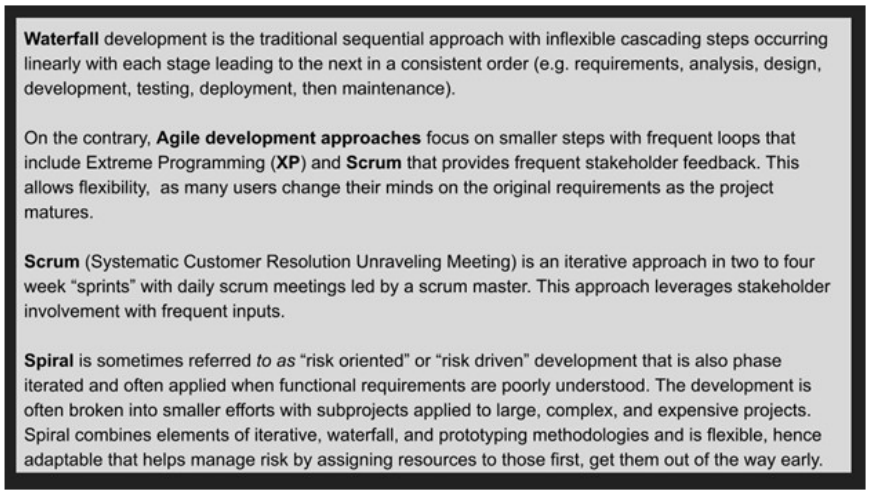

Figure 1. defines the SDLC approaches starting with the traditional cascading waterfall development, followed by agile, XP, scrum and spiral.

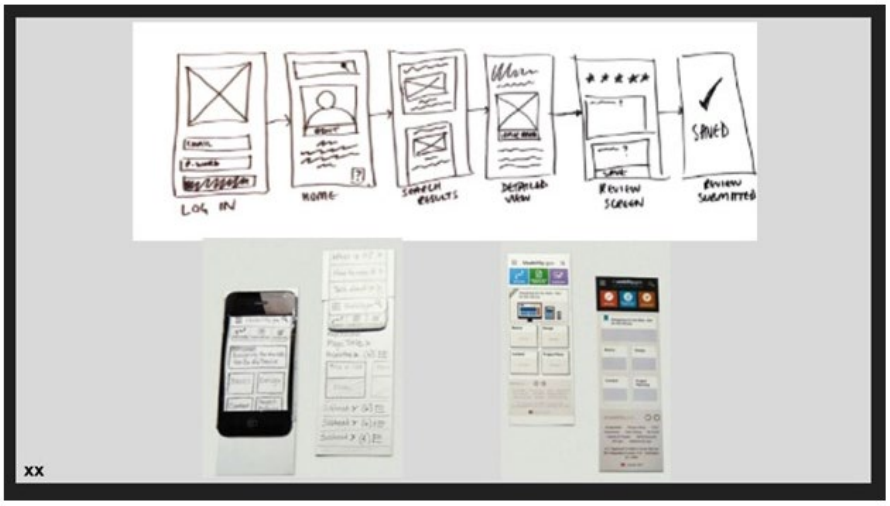

Figure 2. (example low-to mid wireframe) shows notes from a scrum standup on a secure phone app to access imaging data during ICU rounds. This novice associate (after six hours of scrum master training) actually scrolled paper through an old phone case to show a desired end state. When put on the spot in a sprint, some of the craziest ideas (and the best) emerge.

Keywords

Applications; Artificial Intelligence/Machine Learning; Emerging Technologies