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Media informatics

Exposé for a bachelor thesis

Integrating Human-Computer-Interaction methods into agile software development while keeping waste at a minimum

Contents

Tags

Human-Computer-Interaction, Agile, Lean-Startup, Agile Experience Design, Agile-Management methods, Human-Centered-Design, Toolbox

Motivation and problems to solve

A project needs to deliver fast business value, to be technically feasible and desirable by the end-user [1]. To solve this problem, the agile movement came up with many ideas, such as splitting the workload into smaller chunks, to tackle these tasks. But they came at a cost. Integrating the agile manifest meant, that all members of the project and the Client had to commit to it [1]. Therefore a big share of all Web Agencies kept parts of the original waterfall phases in their processes [2]. This led to stiff deadlines which had to be met by an agile team of developers and sometimes also designers [3].
Additionally, there is a different strategy out there, that claims to solve similar problems such as agile. Human-Computer-Interaction (HCI) methods to create a feasible design concept are also used.
More often than not, the end-user is only kept in mind during early concepts. After the solutions are sketched, wireframed, or mocked up there is little to no discussion if the final product pleases the end-user. HCI methods keep the end-user in mind and focus on perfecting the Interaction between the user and the computer or system, as the name suggests.
So to wrap up, the waterfall phases are highly outdated and come with huge risks for the company [4]. Some of those phases were improved. Such as iterative design processes and agile development. But both only put focus on their phase and dictate others [5]. To improve this process and to archive the goal, methods from HCI are needed and have to be integrated and the overall process of creating products has to be modified.
Another big problem is the mentioned little collaboration between Departments [6]. While designers are driven by deadlines and collaborate less with developers, which leads to not viable solutions, developers on the other hand build working software, which is no longer valuable to the end-user [7, 8].
Once the Quality Assurance Department, if there is one, has done its job, the final product gets deployed and only receives irregular updates [9]. This is neither agile nor a sustainable view of digital products.
Requirements will change, therefore the way of reaching a solution must too [10].

We still need to keep in mind the time, budget, and scope of projects. But a subgoal should also be to minimize waste and unused documentation. The Goal will be to bring it all together.

Status Quo

Currently, it is State of the art to use agile management methods, such as scrum, lean start-up, or design thinking, to generate business value faster, reduce risks, increase flexibility and improve customer satisfaction.
Therefore, there are many publications available that discuss integrating user-centered approaches into agile development [11, 12] some even going as far as to call it human-centered [13, 14, 15, 16]. The difference is, that user-centered is end-user focussed, and human-centered means, keeping the focus on all humans interacting with the system.

As for Human-Computer interaction, the most talked-about strategy is human-centered design, which is similar to an agile iterative process, but it focuses on the humans that will use the final product. Agile Experience Design [17] is another strategy that tries to improve on the negatives of agile as it is.
Surrounding Human-Computer interaction, the most complete set of methods and strategies as well as recommendations can be received by the DIN Standards Committee Ergonomics on their Norms [18, 19, 20]. More Information on how to write valuable user stories is found in Jeff Patton's publication "User Story Mapping" [21]. There are still a few publications about the compatibility of HCI and Agile [22] and Human-Computer Interface expert systems for agile methods [23].

But none of the above, there is no differentiating between starting a new project and maintaining a product.

Derived Thesis

Currently, the agile strategy is not concerned with differentiating between a new project and maintaining a product. It is the goal of this thesis to improve on all phases of the processes. The result will take the minimal-waste aspects of lean-startup, human-centered in phases of design and development due to Human-Computer-Interaction methods, and make faster business value through the splitting of workload into smaller, more manageable chunks, following the scrum process. For example, using the Software Architects early on, during the concept phase, will result in much more feasible solutions. Combining that with the required research of HCI will result in a feasible and human-centered solution.
Therefore, the main thesis is: "Integrating Human-Computer-Interaction methods into agile software development while keeping waste at a minimum."

But this thesis will also answer questions like, why integrating human-computer interaction methods is the key to improving satisfaction, why other strategies fail to bring value/satisfaction, and also why software architects should be used early on in a project? To answer these questions, it is needed to discuss other existing strategies, analyze studies and develop a toolbox with methods and strategies for

most use cases. At the end of this thesis, there will be a recommendation to new and old agencies, that want to improve their workflow, to become faster reacting and ready for a change in requirements, while still being able to satisfy the expectations of their clients and end-users.

Procedure

The first step will be to research the available agile frameworks, keeping the focus on the established and mainly used in common working environments. Thereafter, current solutions to the key problems will be analyzed and rated. Following this, it is to decide if further methods are needed, or if the existing ones just have to be modified to accommodate a feasible workflow. All listed methods and strategies will be compared in their benefits and differentiated due to their disadvantages. Next, the decisions have to be made if the set goal of this thesis can be accomplished. Furthermore, the refined methods/tools will be recommended and enhanced by a refined vocabulary based on expert opinions. This toolbox will be additionally added with notes, which are useful for new projects or maintaining an existing product. At last, it is discussed if all gaps were successfully closed, and which are remaining, leading to follow-up projects.

Project Plan

July 14, 2022	Submit Exposé
July 21, 2022	Register thesis
July 24, 2022	Research the Strategies
July 31, 2022	Analyze current solutions
August 11, 2022	Refine methods and tools
August 25, 2022	Refine workflow
September 8, 2022	Decide if further methods are needed
September 10, 2022	Comparing benifits and disadvantages
September 19, 2022	Decide if goal of thesis can be accomplished
September 21, 2022	Establish Toolbox and Vocabulary
September 27, 2022	Write Conclusion
October 5, 2022	Thesis submission
October 12, 2022	Colloquium

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