Project Management Tools to Support Agile Methods in the Workplace

Visualizing Moments Across the Timeline of A Project Through A Project Management User Interface and Suite of Tools

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April 30, 2020
Submitted in partial fulfillment for the degree of Master of Graphic Design

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ACKNOWLEDGMENTS

To my committee — Scott Townsend, Deborah Littlejohn, and Matthew Peterson — thank you for guidance, reassurance, and for challenging me to think, write, and make beyond my comfort zone.

To my MGD classmates and professors, thank you for your dedication, passion, and imagination.

To my parents, family, and dogs, thank you for your constant love and support.

ABSTRACT

Project Management Tools (PMT) support the efforts of time management for an individual or team and have been implemented with specific processes like the Agile Method. Time management is the mutual goal shared between PMT and the Agile Method. Initially, the Agile Method was designed for the use of Software Development. However, workplaces are now adapting the framework to fit into different processes such as design and marketing. This investigation uncovers a need for design interventions into how time is captured in a moment and interpreted between individual workloads and cross functioning teams. Instead of constructing a new PMT, there are opportunities for design interventions within existing management tools that allow for more adaptability.

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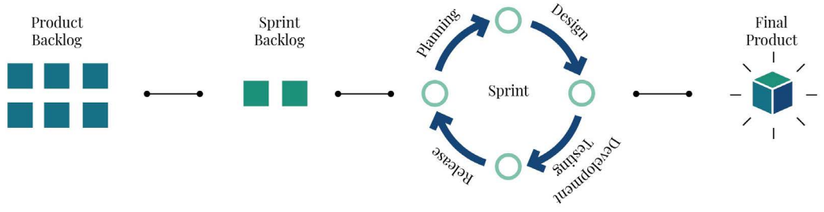
01 THE CONTEXT

WHAT IS AGILE

The Agile Method is a type of project management process initially used for Software Development, where the end product evolves through self-organizing and cross-functioning teams resulting from collaborative efforts. It allows organizations to encounter and react to continuous change (Denning, 2016). The Agile Method stems from the values and principles of the Agile Manifesto (2001) (see Appendix B) created in response to a lack perceived within traditional development methods such as the Waterfall Method which is a linear and sequential approach to project development that follows a timeline approach (Muslihat, 2018). The Software Development field is accredited for the adaption of the Agile Method because the industry naturally improves and innovates at a quick pace. In a rapidly-changing environment, a linear and sequential approach is not appropriate. Agile Software Development is a contemporary response to traditional development methods because it allows the industry to work fast enough to meet customers' needs (Muslihat, 2018). The reason traditional development methods such as the Waterfall Method do not work is that these older models are rooted in a timeline approach, where the development process is sequentially. The final product is not revealed to customers until the end of development, leaving minimal room for reviews, changes, and flexibility (ibid, 2018).



Agile Project Management (APM) (Figure 10.1) has become a popular method as it can deliver complex projects promptly due to its adaptiveness. APM emphasizes four different elements: collaboration, flexibility, iterations, and high-quality results (ibid, 2018). The aspect of collaboration means the team is working together to achieve a shared goal. While Agile is, by definition, flexible, it creates a transformative experience with new tools and

Figure 10.1
the Agile development cycle

frequent meetings. Iterations, also referred to as Sprints, are short amounts of time where the team builds off of user stories to make wireframes into hi-fidelity prototypes. Lastly, high-quality results are products that work correctly and meet the needs of project Stakeholders.

The deliverables of APM include Roadmaps and Product Backlog. Roadmaps are high-level and strategic. They focus on outcomes rather than outputs and contain the requirements needed to achieve the vision of the product (ibid, 2018). The Product Backlog, one of the two artifacts of Agile management, is discussed later in this section (see pg. 9). To deliver and develop a product, APM follows a particular framework (ibid, 2018). Two common frameworks that support the Agile development life cycle are Scrum and Kanban. Scrum is used to implement the ideas behind Agile Software Development. The strategy of Scrum is to develop and deliver a viable product through collaboration, accountability, and iteration. For Scrum to be successful, there are a set of roles, events, and artifacts that work in parallel and are executed through each Sprint (Ali et al., 2017).

Three different groups make up the Agile roles: the Scrum Master or Product Manager, the Product Owner, and the Development Team. The Scrum Master or "servant leader" is the person who leads the team and runs Scrum events. His or her job is to alleviate pain points or roadblocks that are in the way of accomplishing a goal and to manage the Agile process (Nicholson, 2017). The Product Owner represents the Stakeholders and is the voice of the customers (ibid, 2017). Finally, the Development Team is the group of people who make and deliver the product, e.g., UX, testing, delivery, developers, and designers (ibid, 2017).

The Development Team implements five different Scrum events: Sprints, Sprint Planning, Daily Scrum, Sprint Review, and Sprint Retrospective (Retro). Sprints are short iterative cycles of time where small goals are set and accomplished, usually lasting from 1-2 weeks (Hidaglo, 2019). Sprint Planning is where the Development Team meets and plans the upcoming Sprint (Malsam, 2019). Daily Scrum is a short 10-15 minute meeting held at the same time every day, where all of the teams discuss previous achievements and expectations for the next day (ibid, 2019). The Sprint Review is a meeting held at the end of every Sprint where the Development Team presents their work to the Stakeholders and receives feedback (Muslihat, 2018). Finally, there is an event called Retro, where the Development Team reflects on the previous Sprint and establishes improvements for the following Sprint (Malsam, 2019).

Artifacts that support Scrum include the Product Backlog and Sprint Backlog. The Product Owner manages the Product Backlog, and it is a place where all tasks and requirements, such as features, functions, bugs, etc., for a product are archived according to priority (Muslihat, 2018). The Sprint Backlog contains tasks in the Product Backlog that need to be accomplished during the next Sprint (ibid, 2018). The Sprint Backlog is visualized using Kanban. Kanban is a visual method used with APM (ibid, 2018) that provides a visualization of the users' workflow process. A Kanban board, for example, is a visual management tool that is used to visualize the development process.

In the workplace, running under Agile Methodology means embracing a dynamic work environment. As the global marketplace rapidly changes, the Agile workplace environment ensures the company is ready to change no matter what happens.

INTRODUCTION

This investigation focuses on the problems in the Agile Method that collaborators commonly encounter. When I entered into an Agile work environment, I became interested how the method supports a cross-functioning team. I soon discovered that I was the user of a Project Management Tool that did not support collaborators, other than software developers, with the same ease.

As I transitioned into a workplace where teams were autonomous, and Scrum events required much of my participation, I became frustrated. Being new to the Agile Method and walking in as a designer was overwhelming, because I did not have access to track or adjust my progress without help. Scrum Ceremonies constantly disrupted my workflow. It was difficult to comprehend how to be a self-sufficient contributor to the team. Yet, I did not understand why I was asked to take so much time out of my work repeating the same trivial tasks day by day and use a tool that did not support my actions. I started to fall into the conventional belief that the Agile Development Method only works with Software Development projects.

I realized that humans naturally have the instinct to act in an Agile way. Just like tasks in an Agile workplace, we make checklists and to-do lists to keep track of our activities. We have family meals or meetings where we talk, listen, and react, just like the Agile workplace supports Daily Standup and Retro. In both of these scenarios, the objective is increased communication and decreased stress. These small actions change the dynamic of a situation and turn the feeling of being overwhelmed into the ability to successfully manage time (Feiler, B. 2013).

Agile is supposed to be self-organizing, cross-functioning, and flexible, yet the tools used to support the cycle are not flexible enough to adapt to different Agile Methods in the workplace. Through personal experiences and observations, I watched workplaces wrestle to keep up with trends, and I believe they will keep struggling as the marketplace continues to grow and change with time. The Art of Project Management (n.d) discusses the APM philosophy as being “an attempt to make software engineering flexible and efficient.” The modern-day iteration of Agile turned this philosophy into the Agile Manifesto (See Appendix B), which is known for its three-phase approach to project management: initiating, planning, and executing. As we continue in a data-driven world, Agile is becoming more recognized by companies where the values interact, collaborate, and respond to change. Notably,90% of senior executives give high priority to becoming Agile (Denning, 2019).

Through my exploration, I reveal that some improvements are required concerning the functionality of the tools. I address the use of Project Management Tools to support different interactions. The design solution that I propose is a Project Management Tool that follows a five-step design process — starting with learning the audience, then defining the problem or identifying the users’ needs and generating and ideating, prototyping, and testing.

The Project Management Tool is geared towards different roles and facilitates an Agile workflow that can support more design thinking and design tools. However, this modern production philosophy is lacking tools that can expand and contract specific areas of interest necessary for an Agile work environment. My hope through my research and exploration is to design a tool that is more interactive — an Agile tool that has a designerly way of working through the process. Ideally, it would be similar to the definition of Agile, supporting Agile Teams to manage their time across a project while corresponding among the different groups in a more cohesive and productive way.

PROBLEM STATEMENT and JUSTIFICATION

The problem is that Project Management Tools are not practical for users who are not software developers. These tools do not currently support users from different disciplines, however this barrier has not kept users from engaging with the tools. With the help of PMT, projects become achievable with clearly-defined roles, which allows teams to manage all parts of a project more effectively. "Agile enables organizations to master continuous change. It permits firms to flourish in a world that is increasingly volatile, uncertain, complex, and ambiguous" (Denning, 2016). As a whole, Agile enables team members to communicate extensively with each other, which helps teams stay organized and ultimately leads to a higher productivity rate (ibid, 2016).

An understanding of the elements that influence agility and move from the waterfall to the Agile Method, there will be a better understanding of the social dimension of using Agile Methods in specific project development (Murugaiyan and Balaji, 2012). As contributors working in Agile, all team members need to have access to all parts of a project they are working on. However, the lack of project documentation and communication tracking within Project Management Software (PMS) are some noticeable weak spots that have not been properly addressed (Cervone, 2010). It is essential to consider different boundary infrastructures because they reveal relationships among people's tasks. A boundary infrastructure is a network of boundary objects which allows for variations and creates a framework that keeps things moving along (Bowker and Star, 2000). By understanding the concept of boundary infrastructures, designers can begin to understand how different objects are being threaded together to create a functioning network (ibid, 2000).

It is important to trace all tasks within Agile Software Development to ensure two things: (1) that teams are kept accountable for their part of the work in the project and (2) to be able to go back at a later time and trace the project history and other information or decisions that were made during the project process (Fisher, Koning, and Ludwigsen, 2013). Without proper documentation, a project could fall apart due to lack of planning and organization if proper archival of communication is not maintained (Cervone, 2010).

Enric Senabre Hidalgo (2019) worked on a case study that "explores the adoption of Agile Method for the management of projects in collaborative research initiatives (p.1)." The results of this study indicated that "integrating Agile Methods and principles for interdisciplinary collaboration requires a high degree of flexibility and a 'learn by doing' approach" (ibid, p.1). The study concluded that the use of APM has expanded beyond Software Development to other organizational contexts. Some examples of APM use included experimental ethnography approaches in a workplace, academia-industry collaboration, and human-centered research practices.

The Agile Manifesto (2001) (See Appendix B) was a movement founded by independent Software Development thinkers. The idea emerged because of a need for an alternative process of Software Development that allowed for the continuous delivery of software. The founders believed in "promoting organizational models based on people, collaboration, and building the types of organizational communities" in a work environment (History: The Agile Manifesto, n.d.). The purpose of the Agile Method is to deliver viable products to customers by operating in an environment that listens to customers and can act quickly. While the manifesto is symbolic, Agile Methodology is about values and culture (ibid, 2001).

Agile is a method that normally functions best within a Software Development team setting, and Scrum is a well-known method of Agile (Ploos van Amstel, Heemskerk, Renes, and Hermsen, 2017). The difference between the Waterfall Method and the Agile Method is that Agile is flexible and allows changes throughout project development (Figure 10.2). It can also manage large amounts of work and turn that work into quantifiable tasks that can be replicated. While the traditional Waterfall Method is a linear project management approach, it requires all project development phases to be completed at one time. There is a necessity for tools to adapt to continuously changing conditions which make meetings and trivial tasks that are not accounted for included as part of the Agile process (Murugaiyan and Balaji, 2012).

Instead of constructing a new Project Management Tool, there are opportunities for design interventions within existing management tools that allow for more adaptability. For instance, incorporating interactive elements within the existing system will enable users to build a personal language of gestures and user interactions that support Agile roles and actions. Throughout my research, I interviewed individuals within my area of study to gain user understanding and desires. I also created personas, scenarios, and journey maps to find specific moments to address and adapt. From my insights, I developed additional tactics that integrate into existing Project Management Tools. The idea being that individuals working on a project can see what they need to and manage their work progress while also being accountable for themselves and their work time.

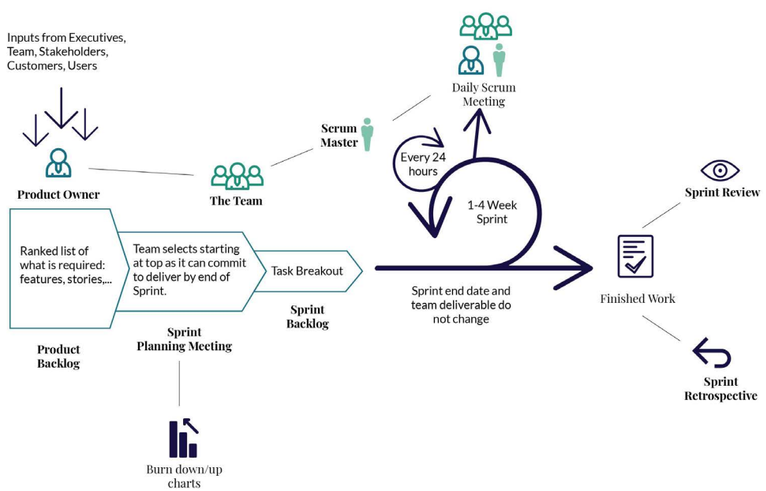


Figure 10.2
the Agile process framework

ASSUMPTIONS and LIMITATIONS

ASSUMPTIONS
For my investigation, I assume there is confusion around the user interface of Project Management Tools. However, I recognize that there is more than one tool and more than one use of the tool. As a designer and participant of the Agile Method and project management, I understand the frustrations of working on a system that is not user-friendly while also taking into consideration that I cannot change the method of Agile too much. Instead, I want to make current tools more user-friendly through their interface and providing intuitive points of accessibility — for instance, the subject of measuring fragments of time within the tool. Through my studies, I intend to simplify the system in a way that makes more sense for the user.

LIMITATIONS
In this investigation, my predominant focus is on timelines and the user interface of PMT used by an Agile Development Team. I am explicitly analyzing how PMT can track the workflow of a project, including meetings, Agile Ceremonies, and written or verbal communication. My scope is limited to the opinions of Scrum Masters, Project Managers, and some contributors to Agile Development Teams. Additionally, I did not produce a working prototype simulation that could be tested by any of the interviewees at a later time due to limited access to technology and human participants.

02 ANNOTATED BIBLIOGRAPHY

As part of my literature research, I explored a diverse range of literature around my problem space. Keywords I used throughout my search included: Agile, Agile Methods, project management software, APM, methods, visual narratives, time representation, and other combinations of the keywords mentioned above. Categories were determined based on the similarities between groups of literature. The overview below provides some of the precedent findings that guided me to the topic that I developed.

Theories, Models, and Related Methods

There are multiple variations of different methods, models, and theories that are used in the workplace — each of which is used as a foundation to run a workplace. By reviewing these sources, I was able to consider different business models and approaches that can be employed or adopted in ways contrary to the founded method.

“A Project Control Process In Pre-construction Phases”	Al-Reshaid, Kartam, Tewari, & Al-Bader, H., 2005
“From Experience: The Agile–Stage-Gate Hybrid Model: A Promising New Approach and a New Research Opportunity”	Cooper & Sommer, 2016
“Agile Business Model Innovation in Digital Entrepreneurship: Lean Startup Approaches”	Ghezzi & Cavallo, 2018
“Getting Things Done: The Science behind Stress-Free Productivity”	Heylighen & Vidal, 2008
“Developing A Grounded Theory To Explain The Practices Of Self-organizing Agile Teams”	Hoda, Noble, & Marshall, 2012
“Agile Business Models: An Approach To Support Collaborative Networks”	Loss & Crave, 2011
“Waterfall vs Model vs Agile: A Comparative Study on SDLC”	Murugaiyan & Balaji, 2012
“Modeling and Architectural Design in Agile Development Methodologies”	Stojanovic, Dahanayake, & Sol, 2003
“Digital Business Model Effectuation: An Agile Approach. Computers In Human Behavior”	Xua & Koivumäki 2019

Table 10.1
theories, models, and related methods

Software Development Classifications

Finding and understanding the architecture of Software Development tools helped me consider the difference between key terms like software, tools, platforms, and applications. Some of these sources also prompted the discovery of my sub-questions.

“Fundamental Uncertainties In Projects And The Scope Of Project Management”	Atkinson, Crawford, & Ward, 2006
“Utilizing Atlassian Jira For Large-Scale Software Development Management*”	Fisher et al., 2013
“Views and Viewpoints in Software Systems Architecture”	Hilliard., 1999

Table 10.2
software development classifications

Agile Design Methods

There are distinct ways to run the Agile Method in the workplace. So by grasping the differences between different methods and philosophies that companies use to practice Agile in a workplace, I was able to discern how Agile can work within an industry and still assist in the performance of a company.

"Framework for Applicability of Agile Scrum Methodology: A Perspective of Software Industry"	Ali, Rehman, & Anjum, 2017
"Exploring Principles Of User-centered Agile Software Development: A Literature Review"	Brhel, Meth, Maedche, & Werder, 2015
"Understanding Agile Project Management Methods Using Scrum"	Cervone, 2011
"Is The Agile Manifesto Still A Thing?"	Drumond, n.d.
"What is Agile Workflow?"	Horsnell., 2017
"Effective Implementation of Agile Practices"	Jyothi & Rao, 2011
"Manifesto for Agile Software Development"	Manifesto for Agile Software Development, 2001
"How To Combine Design Thinking And Agile In Practice"	Roach, 2015
"Integrating Usability Work into a Large Inter-Organisational Agile Development Project: Tactics Developed by Usability Designers"	Wale-Kolade, 2015

Table 10.3
Agile design methods

Software Development Case Studies

I found the Software Development case studies to be a fascinating part of my literature findings because they have varied developments to which they are studying over a period of time. This category, in particular, challenged me to think about how adaptive software can be, and I even considered if it was the software that needs to be adaptive or the method itself.

"Adapting The Scrum Framework For Agile Project Management In Science: Case Study Of A Distributed Research Initiative."	Hidalgo, 2019
"Empirical Study of Agile Software Development Methodologies: A Comparative Analysis"	Matharu, Singh, Mishra, A., & Upadhyay, 2015
"Interpretative Case Studies On Agile Team Productivity And Management."	Melo, Cruzes, Kon, & Conradi, 2013
"The Value of Agile Methods in Designing for Behavioural Change: A Case Study."	Ploos van Amstel et al., 2017

Table 10.4
software development case studies

Representing Time and Info through Visual Narratives

Time is strange and complex. Even though it is a standard way of functioning, time is relative, and time is different for everyone. Considering that project management is centered around time, it became necessary for me to look into different ways that it is interpreted and what can be expressed through time.

"Time and Time Again: The Many ways to Represent Time"	Allen, 1991
The Social Life of Information	Brown & Duguid, 2017
"Representing Time In Language And Memory: The Role Of Similarity Structure"	Faber & Gennari, 2015
"Communication Modes In Collaboration: An Empirical Assessment Of Metaphors, Visualization, And Narratives In Multidisciplinary Design Student Teams"	Graff & Clark, 2017
"Storytelling: The Next Step For Visualization"	Kosara & Mackinlay, 2013
"Narrative Visualization: Telling Stories with Data"	Segel & Heer, 2010

Table 10.5
representing time and info through complex visual narratives

Boundary Objects and Infrastructure

Boundary objects and infrastructure are functional. Boundary objects inhabit different communities of practice, while boundary infrastructures are used within human activities like communication networks. A boundary infrastructures is a framework made up of relationships between various entities distributed along a technical or social and global or local axes. The infrastructure itself is a representation of how issues fit into social and organizational structures (Bowker et al., 2010). The concept behind these terms is the idea to have a system where the individual has an interface that presents different arrangements of scenarios within the system.

"Boundary Object Use In Cross-cultural Software Development Teams"	Barrett & Oborn, 2010
Sorting Things Out: Classifications And Its Consequences (Inside Technology)	Bowker & Star, 2000
"Toward Information Infrastructure Studies: Ways Of Knowing In A Networked Environment"	Bowker, Baker, Millerand, & Ribes, 2010
Boundary Objects and Beyond: Working with Leigh Star	Bowker, Timmermans, Clarke, & Balka, 2016
"Making Knowledge In Boundary Infrastructures: Inside And Beyond A Database For Rare Diseases"	Dagiral & Peerbaye, 2016
"Design Boundary Dynamics In Infrastructure Projects: Issues Of Resource Allocation, Path Dependency And Problem-solving"	Zerjav, 2015

Table 10.6
boundary objects and infrastructure

03 FRAMEWORKS and RESEARCH QUESTIONS

CONCEPTUAL FRAMEWORK

Conceptual Frameworks (Figure 10.3) draw boundaries around an investigation, identifying what is and is not a part of the study. By defining a specific set of ideas that can be used within a more extensive system, I conceptualize five different elements that create a flexible mechanism of control. The network intends to enable companies to quickly adapt to the changing environment and empower the people to make effective changes (Conboy, Lang, and Kohan, 2010).

ACTIVITY THEORY

Activity Theory "focuses on the analysis of activities as goal-oriented interactions of people with their environment, through the use of physical and psychological tools (Davis, 2018, p.229). It can provide ways for thinking about design acting within a participatory culture. Through activity theory, goals are made, actions are taken, and actions become operations. Activity theory takes into consideration the relevance of undertaking the activity how they can influence the environment (Chita, 2018).

EMPIRICAL PROCESS CONTROL THEORY

The Empirical Process Control Theory is a process usually defined as a collection of random variables that describe the system in a given state (Empirical Process Control, n.d. and Lean-Agile Training, 2019). It relies on three main ideas: transparency, inspection, and adaption. On an Agile Team, transparency creates an open work culture by allowing easy access and flow of information. Inspection represents the plan, progress, feedback, and deliverables of the product. Adaption is a skill learned by the team through transparency and inspection and then adapted by making improvements (SCRUMstudy, 2017).

GETTING THINGS DONE METHOD

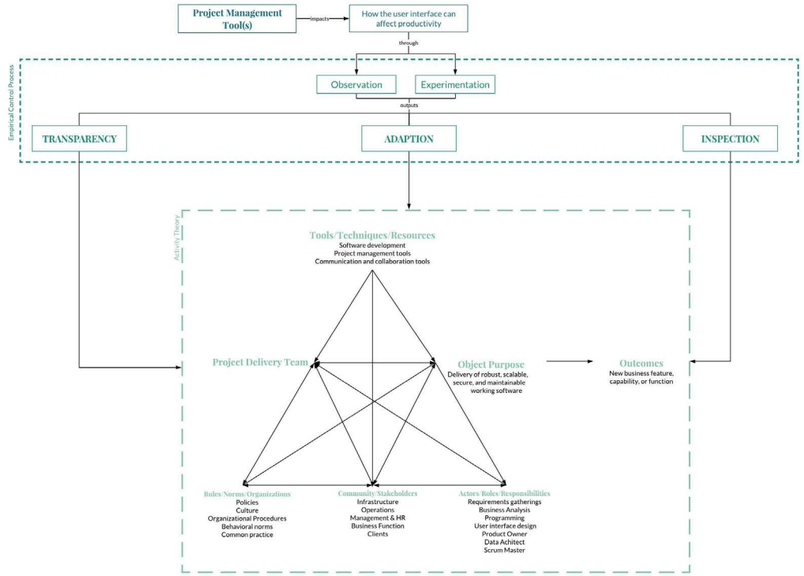
The Getting Things Done (GTD) method is a method for "enhancing personal productivity and reducing stress caused by information overload" by organizing tasks that are actionable and can be executed in a way that gets one close to the desired goal (Heylighen and Vidal, 2008, p.585).

INFORMATION PROCESSING MODEL

The Information Processing Model framework is used to explain how the brain processes information. The information processing model works in three stages. The first is sensory memory, working memory, and long-term memory. The sensory memory is the shortest and can only retain impressions. The working memory is a part of short-term memory, and provides temporary storage for processing information. Long-term memory is permanent storage that can be retrieved back into the working memory (Carmany, Tetlan, and Karl, 2017).

SYNTHESIS

Project Management Tools are the foundation for the Empirical Process Control Theory setting the stage for three separate output concepts. The three stages within the Empirical Process Control Theory together make up the conceptual framework of my research. Building forward from the top, each of the GTD methods has an Empirical Process Control Theory intertwined within the system that functions as cyclical cycles allowing constant productivity throughout all combined to create an information processing model. These three outstanding outputs are mini concepts that can operate within the "thing" and work together to produce a tangible outcome or user interface. The three outputs combine to form different parts of the activity theory, which is a conceptual process of how the "thing" will be made.



The expanded conceptual framework (Figure 10.4) depicts the entire concept of my investigation — beginning with the idea of a Project Management Tool that impacts how the user interface can affect productivity through observation and experimentation in three different ways: transparency, adaption, and inspection. The three different outputs are zoomed-in moments in the big picture. Transparency focuses on snapshot moments in a project. For example, different profile views and personal burndowns would be represented in this section. Adaption encompasses the expanding and collapsing time and how specific moments can be depicted in a timeline of a project, for example, the project timeline, Agile Ceremonies, and contributor tasks. The inspection looks into version history and the documentation of changing circumstances such as project files and notes from meetings. These three outputs are integrated within each other and also make up a majority of the bottom part of the framework, which encompasses the activity roles within the conceptual framework.

Figure 10.3
compact conceptual framework

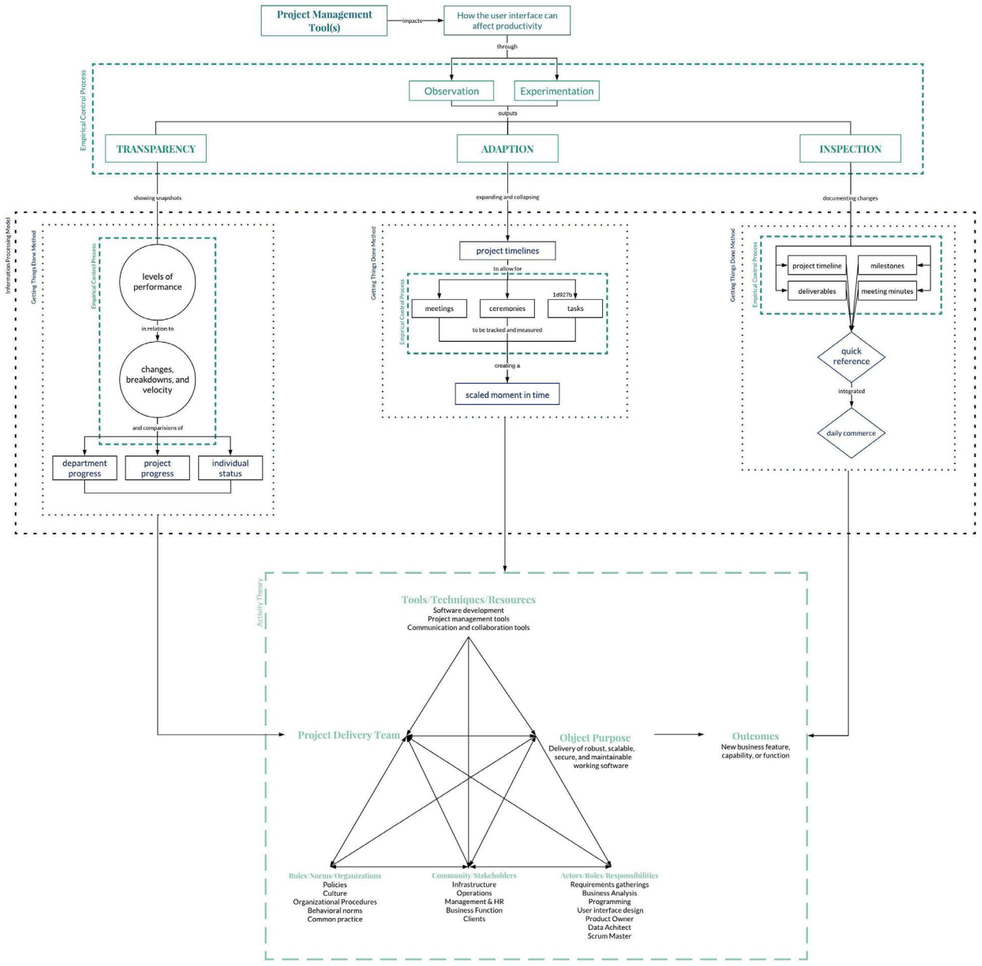


Figure 10.4
expanded conceptual framework

INVESTIGATIVE FRAMEWORK

The idea of the investigation framework is to help to correlate evidence and intelligence to help investigate more effectively. Therefore, it can visually interpret resources and how they will be used. The investigation matrix framework (Figure 10.5) explores the relationship between accountability and interaction. While accountability and interaction work parallel in the Agile Method, they are different. Accountability is about responsibility, and interaction is about the involvement of something. During my research and construction of the investigation matrix, I found two different ways to communicate my investigation. The investigation framework matrix explores how profiles, versions, and moments are depicted and work together to form a flexible product outcome.

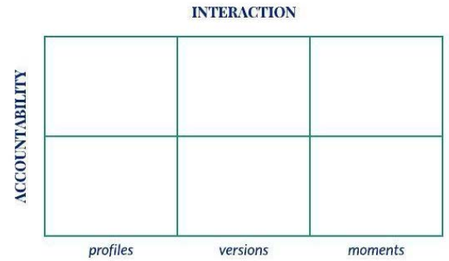


Figure 10.5
investigative framework matrix

The more fluid process (Figure 10.6) depicts the matrix as the Agile process would interpret it as a cycle of doing. Here I am trying to explain that in my investigation, the foundation of the objective is made up of the interaction and accountability that is supported throughout a project. Each of these traits is received in different formats as particular user groups, versions, and captured moments in time and formalize the outcome.

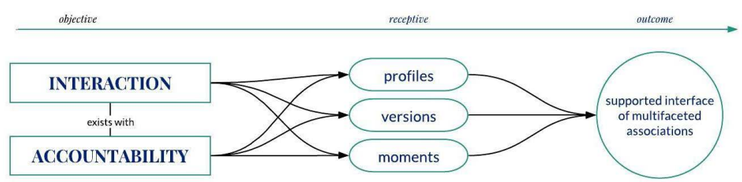


Figure 10.6
investigative framework process

RESEARCH QUESTIONS

MAIN QUESTION

How can the design of a Project Management Tool support varied interactions through the interface within cross functioning teams to track project workflow in an Agile workplace environment?

SUBQUESTIONS

01 **Transparency**
How can a single Project Management Tool be used to treat multiple work situations simultaneously?

02 **Adaption**
How can a Project Management Tool scale the representation of time by expanding and contracting specific moments throughout a team project?

03 **Inspection**
How can a Project Management Tool enable perpetual modifications during all stages of a project?

DEFINITION OF TERMS

Agile Method. The Agile Method is a management practice that allows organizations to encounter and react to continuous change (Denning, 2016).

Agile Project Management (APM). It is a popular method to use because it can deliver complex projects promptly due to its adaptiveness (Muslihat, 2018).

Agile Software Development. It was the result of the Software Development industry method because it allowed for quicker reaction to demands (Muslihat, 2018).

Boundary Infrastructure. Boundary infrastructure is a network of boundary objects which allows for variations and creates a framework that keeps things moving along (Bowker and Star, 2000).

Boundary Objects. "Boundary objects are those objects that both inhabit several communities of practice and satisfy the informational requirements of each of them"(Bowker and Star, 2000, p. 297).

Daily Scrum or Standup. Scrum is a Daily Standup meeting, no more than 10-15 minutes, where the team syncs and shares what they are planning on accomplishing that day (Malsam, 2019).

Kanban (board). Kanban is a visual method used with Agile project management usually depicted as a visual management tool that is used to visualize the development process (Muslihat, 2018).

Product Backlog. A place where all tasks and requirements, such as features, functions, bugs, etc., for a product are archived in order of priority (Muslihat, 2018).

Product Owner (PO). "The Product Owner is responsible for conveying the vision of the Stakeholder to the team" and problems and progress from the team. They are responsible for the return on investment so they have an authoritative position to make decisions (Nicholson, 2017).

Project Management (PM). Project Management is "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements" (The Art of Project Management, n.d.).

Retrospective (Retro). The Retro is a meeting that occurs at the end of the Sprint. This gives the team the opportunity to review their work and identify things that went well, did not go as planned, and how they can make the next Sprint better than the last (Malsam, 2019).

Roadmaps. A roadmap contains the requirements needed to achieve the vision of the product (Muslihat, 2018).

Scrum. Scrum is a development method that provides insight, quick adaptability, and self-organized productivity. It is executed through Sprints (Ali et al., 2017).

Scrum Master (SM) or Project Manager (PM). The Scrum Master or "servant leader" is the facilitator of Agile. Their job is to alleviate any pain points or roadblocks that are in the way of a goal. They are also the ones to enforce Agile Ceremonies and manage the process of projects (Nicholson, 2017).

Development Team (contributors). "The team is responsible for all activities that lead them towards their Sprint goals." They are responsible for prioritizing their tasks and attending Agile Ceremonies (Nicholson, 2017).

Sprint Backlog. Contains tasks in the Product Backlog that need to be accomplished during the next Sprint (Muslihat, 2018).

Agile or Sprint Ceremonies. Sprint Ceremonies are a set of four meetings (Sprint Planning, Standup, Review, and Retro) that are held at the end of each Sprint. They ensure that everyone (Scrum Master, Product Owner, Team) is synced (Malsam, 2019).

Sprint Planning. Sprint Planning is a meeting where the whole team gathers and decides what they need to accomplish in the next Sprint (Malsam, 2019).

Sprint Review. The Sprint Review is a meeting held at the end of every Sprint where the Development Team presents their work to the Stakeholders and receives feedback (Muslihat, 2018).

Sprints. Sprints are short iterative cycles of time, 1-2 weeks, where planned tasks are completed and are ready for review (Hidaglo, 2019).

Stakeholder. "The Stakeholder is responsible for conveying his wishes and concerns to the Product Owner." It is important for the Stakeholders to have a good relationship because it is their job to keep the PO updated on any changes made to the plans (Nicholson, 2017).

Waterfall Method. A linear and sequential approach to project development that follows a timeline approach (Muslihat, 2018).

04 METHODS

METHODS

Concept and Literature Mapping. "Concept mapping is a visual framework that allows designers to absorb new concepts into an existing understanding of a domain so that new meaning can be made" (Hanington and Martin, 2012, p.38). I created a visual framework of all of the relevant literature I found. The mapping helped me gain a better understanding of my field of study and respond to connections from different pieces of literature and how they are similar or different from each other. It also helped me see gaps in my research that I needed to go back and research more thoroughly.

Interviews. "Interviews are a fundamental research method for direct contact with participants, to collect firsthand personal accounts of experience, opinions, attitudes, and perceptions" (Hanington and Martin, 2012, p.102). I wrote and conducted interviews with coworkers and other individuals in my field of research that work in an Agile work environment or other individuals who have experience with project management. After conversing with these individuals, I used some of their experiences as inspiration for my designed "thing."

Personas. "Persona consolidate archetypal descriptions of user behavior patterns into representative profiles, to humanize design focus, test scenarios, and aid design communication" (Hanington and Martin, 2012, p.132). As a part of my initial study, I developed personas that helped me to understand and capture specific behaviors in a realistic way and find my target audience.

Precedent Studies. I found existing solutions to my area of study and evaluated their qualities and features where there may be opportunity gaps for my designed "thing."

Scenarios. "A scenario is a narrative that explores the future use of a product from a user's point of view, helping design teams reason about its place in a person's day-to-day life" (Hanington and Martin, 2012, p.152). By writing scenarios, it helped me to work through a person's experience as they would engage with a product. This was a helpful way to make ideas concrete, guide my designs, and understand the users' point of view.

User Journey Maps. "A user journey map is a visualization of the experiences people have when interacting with a product or service so that each moment can be individually evaluated and improved" (Hanington and Martin, 2012, p.196). The user journey map helped me walk through the users' experience and gauge their feelings and perceptions of the designed scenario. The process of creating problems and finding solutions opened my eyes to problem areas where I found angles for design intervention.

Visual Studies and Prototyping. "Prototyping is the tangible creation of artifacts at various levels of resolution, for development and testing of ideas within design teams and with clients and users" (Hanington and Martin, 2012, p.138). Visual studies included sketches and wireframes. I also built high resolution designed artifacts that could be tested by my peers and users. Creating these different visuals helped me to imagine what this product would be capable of doing in a real setting.

PRECEDENTS

Adobe CC. *Adobe Premiere Pro* is a video editing application that is time-line based. Although it is aimed for the home user, it has been used professionally because of its common editing tasks like resolution, quality, formats, audio files, and different dimensional editing. *Adobe After Effects* is a motion graphics and visual effects composition application. It is usually used for tracking and animation and follows a non-linear editing system which includes audio, video, and image. *Adobe Audition* is an application that works specifically with audio content. It can support multitrack, waveforms, mixing, editing and new compositions (Adobe CC, n.d.).

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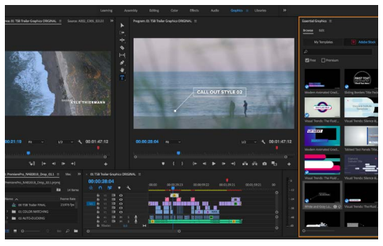

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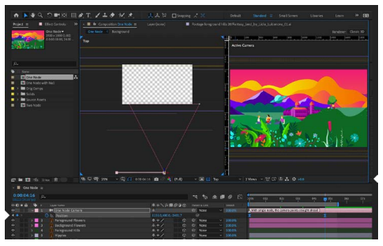

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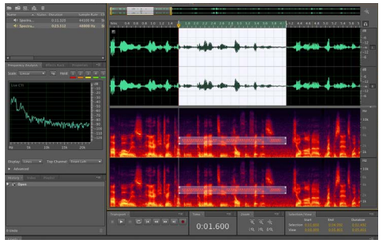

Figure 10.7 Adobe CC user interfaces
(a) adobe premiere pro timeline
(b) adobe after effects timeline
(c) audition timeline

Airtable. Airtable is a very interactive spreadsheet that can be utilized in Jira. Airtable is used for organization and can be configured into various screen views. Other features include linking files and tasks and color coding everything. This cloud collaboration service makes it clear who is responsible for what and when important dates are just around the corner (Airtable, n.d.).

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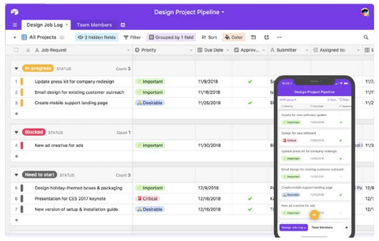

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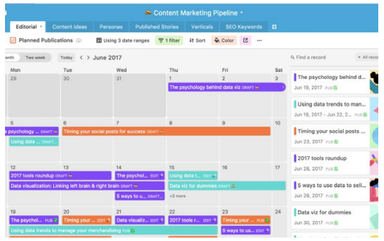

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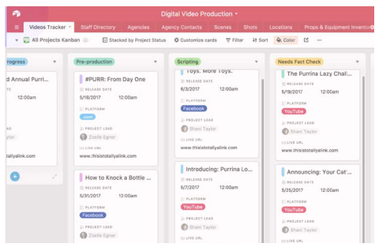

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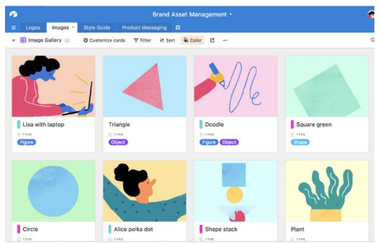

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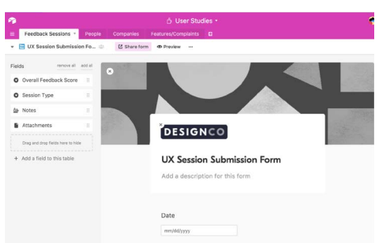

Figure 10.8 Airtable user interfaces
(a) grid view
(b) calendar view
(c) kanban view
(d) gallery view
(e) form view

Cim Database. The Cim Database was designed to be a turnkey system. From the conception phase to the logistics, it supports product data management and product lifecycle management. It works from the conception phase to the logistics. As a system for Product Lifecycle Management, it provides easy access to data, supports daily individual and teamwork, and also provides guidelines and workflow support through a project (CIM Database, n.d.).

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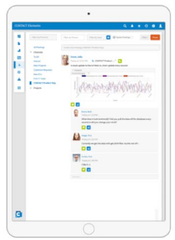

Figure 10.9 Cim Database user interfaces
(a) profile view
(b) cim database interface
(c) messenger and comments

Concept Share. Concept Share is an online proofing software for design and marketing work. The software utilizes workflows and makes the process move quicker. By keeping the team aligned, concept share provides a space for clear, actionable feedback and provides a detailed history of comments, markups, and approvals that dates back to the beginning of a project (Concept Share, n.d.).

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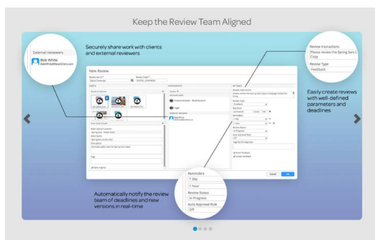

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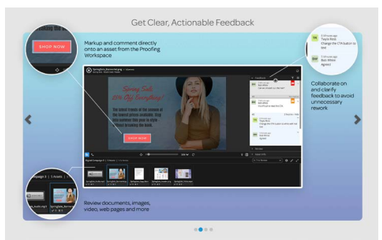

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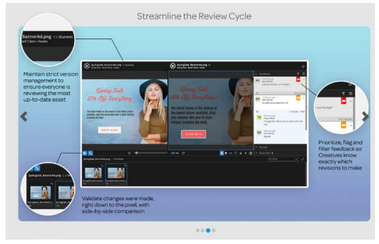

D

Figure 10.10 Concept Share user interfaces
(a) notifications
(b) activity feed and notifications
(c) file and version history
(d) track and audit project performance

Figma. Figma is an online design tool used for collaboration. It is like Sketch, but the collaboration aspect of it makes it stand out. This tool allows you to collaborate in real-time, share designs with Stakeholders to review and make comments, and where developers can inspect elements and see the current source-of-truth. Nowadays, not all parts of a team are local, so being able to have access to a tool and collaborate in real-time is a very nice feature to have (Figma, n.d.).

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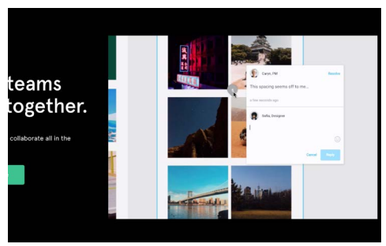

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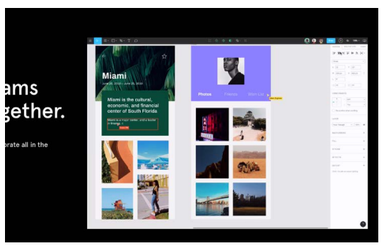

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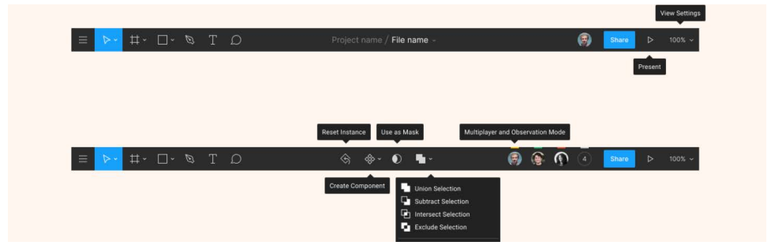

Figure 10.11 Cim Figma user interfaces
(a) toolbar
(b) interactive working
(c) comments

Jira. Jira is a reputable issue tracking and Project Management Software and can support several Agile Methodologies. One of the benefits of Jira is that it can track project breakdowns and can manage basic add-ons like slack, lucidchart, and google drive. Another thing to note about Jira is that it was built for software teams in mind (Jira, n.d.).

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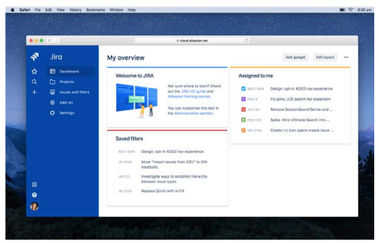

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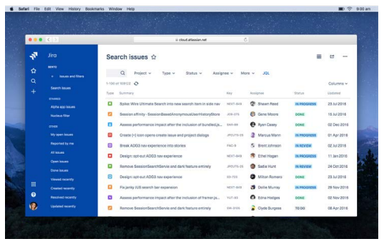

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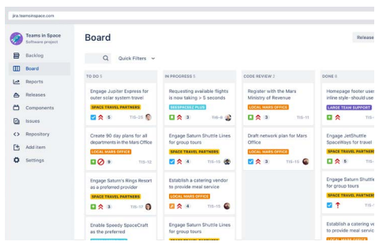

Figure 10.12 Jira user interfaces
(a) dashboard
(b) project search
(c) kanboard

LeanKit. LeanKit is a visual project management software. It helps the Project Managers and Scrum Masters to anticipate what will happen in the future, and it helps the team visualize their work. What is different about LeanKit is that they offer two different visual types of Project Management Software — visible and list-based. Features include big picture visuals of projects, custom Kanban board layouts, insights of project progress, easy access to communicate with anyone on and off the team (LeanKit, n.d.).

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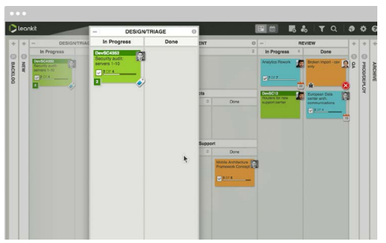

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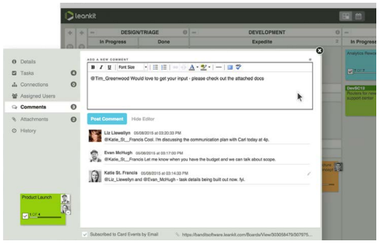

Figure 10.13 LeanKit user interfaces
(a) kanboard
(b) task details
(c) project breakdown view
(d) comments

Rally. Rally is a software built for Agile development. It is known to be an 'Enterprise-Class Platform' that features real-time work status and various planning features that range from small tasks to extensive project breakdowns. Unlike other platforms, Rally offers a team board, which is an area where teams can start laying out projects without the assistance of the administration (Rally, n.d.).

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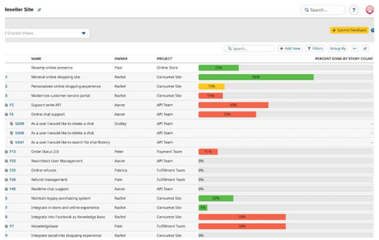

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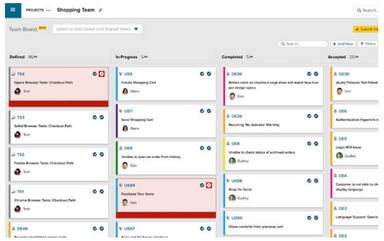

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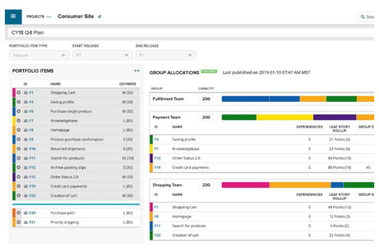

Figure 10.14 Rally user interfaces
(a) project view
(b) kanban board
(c) project status

Slack. Slack is a platform that brings all communication together. Projects and teams can be divided into channels, and threads of conversations can be kept organized by discussion topics. Slack provides a way to streamline all project work, share files, and can be integrated with several different tools. Slack would be a great way to incorporate conversations around projects into Project Management Software because it creates a comprehensive paper trail of the project (Slack, n.d.).

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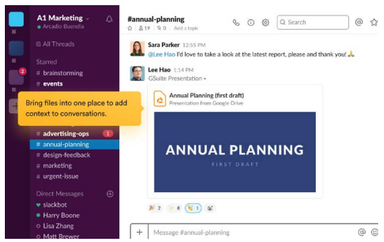

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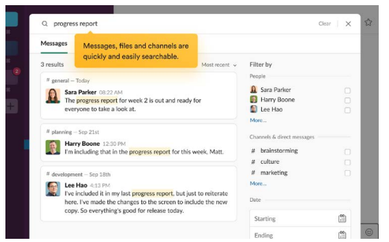

Figure 10.15 Slack user interfaces
(a) file sharing
(b) searching

StudioBinder. StudioBinder is a well-known production management software for photo, video, and film. With a click and drag interface, StudioBinder can handle various kinds of interactions such as file storing, file sharing, and file creating. It also supports scheduling, call sheets and calendars that mark milestones and track statuses (StudioBinder, n.d.).

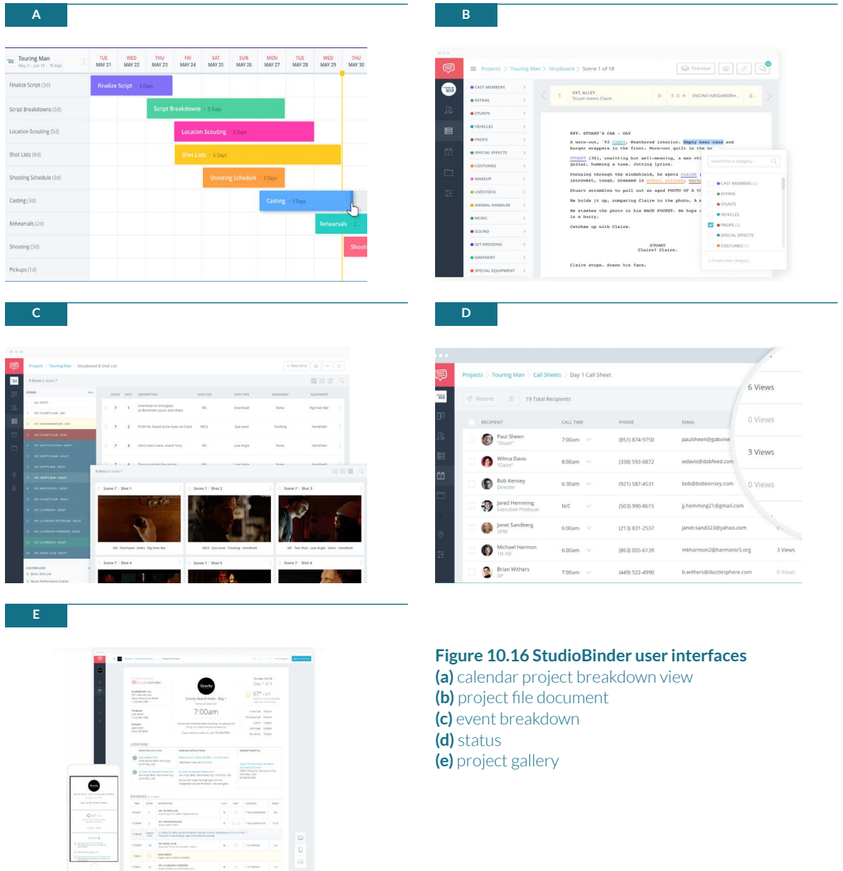

Figure 10.16 StudioBinder user interfaces
(a) calendar project breakdown view
(b) project file document
(c) event breakdown
(d) status
(e) project gallery

Taiga. Taiga is an open-source project management platform that can handle only a couple of different Agile Methods for startups. One thing that made Taiga stand apart from other Project Management Software was that it could support third-party video conferencing (Taiga, n.d.).

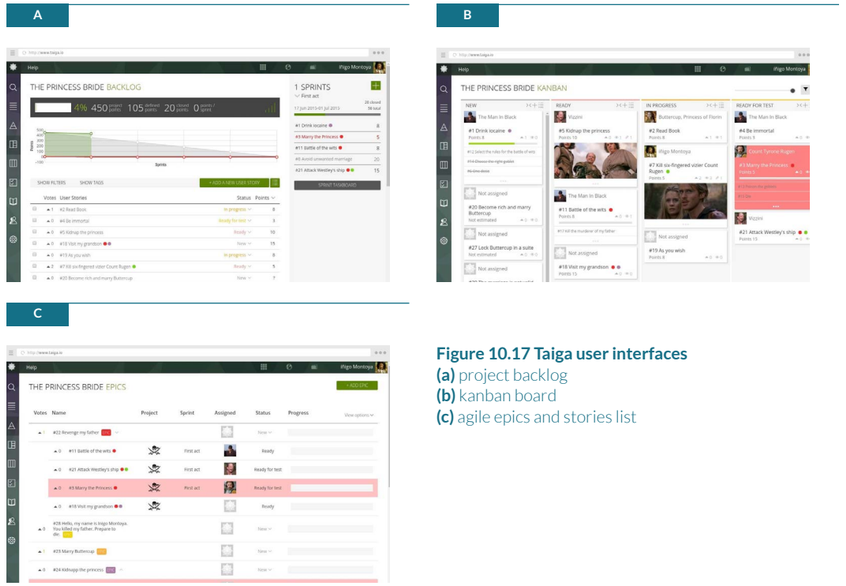

Figure 10.17 Taiga user interfaces
(a) project backlog
(b) kanban board
(c) agile epics and stories list

Trello. Trello is a web-based list-making application that could also be better described as a simplified online productivity platform. The concept behind this tool is that it is an easy way to create lists and flexibly prioritize tasks. The interface behind it makes all the duties not overwhelming, but then there is a feature where if you look at a single task, you can add descriptions, dates, and checklists within that specific task. Trello helps with time management and prioritization while still seeing the big picture, and these are all important when working on a project (Trello, n.d.).

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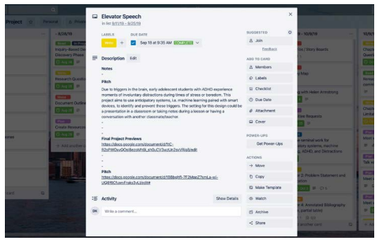

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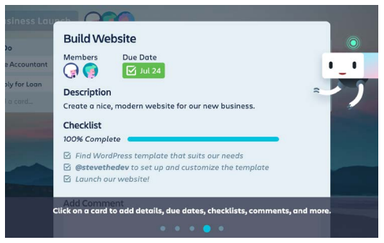

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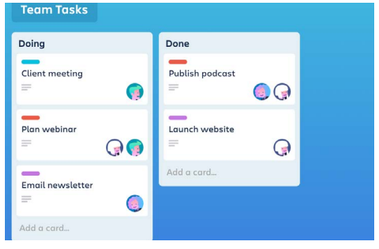


Figure 10.18 Trello user interfaces
(a) task details
(b) kanban board
(c) quick task view

INTERVIEWS

Throughout the interviews I conducted (See Appendix A), I noticed several trends. Some were obvious, while others were not. The first trend, one that everyone showed interest in, was the ability to see other contributor profiles and work progress. The second was the idea of having a more interactive user interface. Not as far as a computer user interface, but having a tool that can provide prompts, alerts, or some notification. Finally, I noticed some dissatisfaction. For instance, the idea of having more of the process represented and previous versions of work along with the time accountability of meetings and synchronization between calendars and Project Management Tools.

OLIVER
Oliver is the Scrum Master and Agile Mentor for a manufacturing company. His role as a Scrum Master is to take any impediments away from the team and be a subordinate leader. It is his responsibility to point out where people are inefficient and grow that efficiency and make sure people stay on task. The Scrum Master should take ownership, not in the meeting, but in taking ownership to help teams get rid of whatever is getting in their way. His role as the Agile mentor is to try to push the adoption of Agile further.

KEY FINDINGS
- Jira is a useful tool for the contributor, but for the administrator, it needs a lot of improvement.
- Every Agile Team operates differently, and the role of the Scrum Master is to try to make the most out of each team's capabilities and project goals.
- The value of Agile over classic planning tools is that it allows you to turn corners quicker
- "One of the great values I think of an Agile model is it allows people to be skilled in their disciplines."
- "The whole purpose of Agile and Scrum, in particular, is to be predictive in what you're going to do in the short term to commit to these tasks in that Sprint, these are the things that are going to get done and they get done."
- People always want to do the best that they can — smart people are naturally chaos planners.

MICHAELA
Michaela is a Program Manager at a large software company leading a team that does legal source publication. Although she doesn't have formal training, she has over 12 years of experience working within the project management sector. Other roles Michaela has had include project owner on an Agile Development Team and Project Manager. With all of these opportunities, she typically is aggregating multiple projects centered around Agile, checking the status of project epics, making sure teams are on task as the due dates approach. Another big part of her job includes taking whatever blockers people had and going out and figuring out how to fix them.

KEY FINDINGS
- Do not try to implement complete consistency within every team, instead understand what the things are that are important to be consistent and align on those.
- It's hard to have a pure version of Agile.
- Meetings do not take away from workflow because it means everybody understands what's happening to help you be better to the line and more efficient.
- It would be interesting to have more of the process visually represented, and a calendar is coming into fruition or corresponding and visual reminders.
- More intelligence can work through all of the data and learn from it. For example, it would be nice to be able to say, "Hey, it's Retro time. These are the three things you said were actionable last time. Did you do them?"

LUCAS
Lucas is a UX/UI design intern for a manufacturing company. He is developing a piece of technology that can read filter levels and maintenance and predict maintenance scheduling for fleet managers and heavy-duty devices like excavators. Lucas has experience working under the Agile Method as a designer and faces challenges within the process and the usability of the Project Management Software.

KEY FINDINGS

- Agile ways and Project Management Software are not readily adaptable.
- Terms in the Agile Method have positive and negative connotations that cause different reactions.
- Story points may be an inaccurate way to measure productivity velocity.
- Jira, the project management software, needs a simpler user interface like Trello.
- It would be interesting to have a software that is more socially interactive and customizable with the user.

JILL
Jill was a Graphic Designer at a manufacturing company. Her daily duties included assisting the marketing and communications manager with all the marketing efforts for Senzit. Together she and the manager planned all of the efforts for the teams. They would put out ads, help design newsletters, make videos, and more.

KEY FINDINGS

- Interesting to see version history once a project goes live. Hesitant about beforehand since revisions are always changing and the abundant amount of notifications flooding the inbox.
- Sending in Daily Standup notes is annoying because it takes time out of the day, and it is enough that everyone has access to your log on Jira.
- “I am not worried about what other people are doing. Right. I am worried about what I am doing, and I think other people on the team probably feel that way also.”
- Review structure has changed by gearing towards specifically the Stakeholders. So most crucial Sprint goals are what is going to be reviewed.
- Also, questioning the review as “what did we get out of that?”
- Agile means “you can’t just go to work and sit down and do your work. You gotta be engaged in the team.”
- Would instead send the notes, no stand-up.

ABBY
Abby is a visual designer for a financial services corporation. She works in an AI incubator designing products that utilize machine learning and computer user interfaces. She works with a team of developers and a few other designers on multiple projects at a time.

KEY FINDINGS

- Uses LeanKit Project Management Software and Microsoft Teams in the office.
- Designers do not necessarily follow all parts of a Sprint, and Agile Ceremonies are pointless to attend.
- There is a frustration with sharing and finding files between designers and the Development Teams.
- Wants a feature on a Project Management Tool that makes the handoff easy between contributors and teams with version history and a naming convention.
- Would like a tool that can facilitate in-person interactions because face-to-face communication is the easiest way to communicate.

SETH
Seth is a Product Owner at a manufacturing company, but he also has a Project Manager background. He is responsible for setting the strategic direction of a project and road mapping out the features that need to be implemented in a piece of software. Seth also does a lot of general management facilitation Products. As for his interactions with Jira and other software, he will make recommendations and guidance toward the actual tasks, and he lets the team populate the specifics.

KEY FINDINGS

- Story points are more focused on the individual and less concentrated on the time that's spent because people are inherently terrible at estimating the number of hours that they're going to spend on something.
- Agile is the best way to manage a product timeline if it's a software or something that can be sent out in real-time or live updated.
- More forced communication touchpoints with Agile from forced cadence and structured ceremonies that come with Scrum.
- Agile Ceremonies consume much time, but the time spent prepping, planning, and the transfer of knowledge far outweighs any of the deficiencies that you have from not working.
- If you empower the team with the tool, where everyone can log meeting minutes or documents, there can be a lot of value in that.
- Having a task list and the backlog that would be quickly visualized on an overarching calendar would be something that would be valuable.
- Vertical escalation is an essential tool that a Project Manager has.

PAIGE
Paige is a Data Scientist at a multinational technology company. Her job is to build predictive models that work within Senzit. She specifically works on categorizing radius equipment types for the customers. Paige has experience working under Agile from two different companies, so her responses are a comparative combination of her skills at both places.

KEY FINDINGS

- At her previous place of work, she only used Jira for managing bugs and used another tool called Agile Gaadi for management.
- Vertical is another practice within Agile where the team has to slice a work item that has too many parts to handle for a single resource.
- Grooming is another practice within Agile where the team reviews the items in the backlog to ensure tasks are prioritized and appropriate for the goal.
- Having the entire company runs under the same Agile Method makes it easier to work with other teams cross-functionally.

Personas

"Persona consolidate archetypal descriptions of user behavior patterns into representative profiles, to humanize design focus, test scenarios, and aid design communication" (Hanington, B. and Martin, B. 2012, p.132). I made a framework (Figure 10.19) showing the relationship between each of the Agile roles. I also created four personas (Figure 10.20) from the research I collected about key Agile roles in the workplace and the information I gathered from interviews.

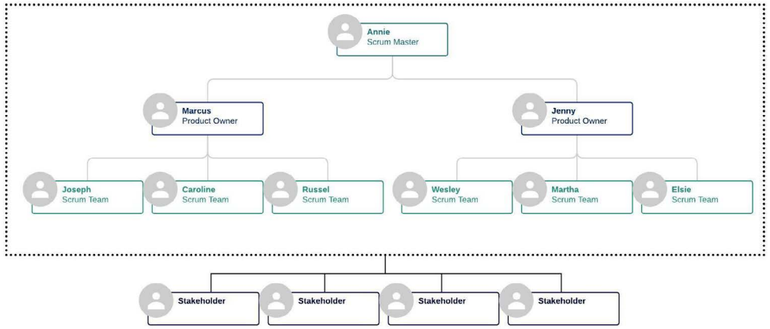


Figure 10.19
the Agile roles framework

A

Caroline

Collaborator on Scrum Team

ABOUT

Age: 22
Archetype: The Free Spirit

Caroline is a young woman just out of college. With only a few years of work experience, she is a new addition to the scrum team and is always willing to learn and take on challenges. She is committed to working on a cross-functional team. During her time off she enjoys calligraphy and listening to podcasts.

RESPONSIBILITIES

- Planning activities that lead them towards sprint goals
- Fulfilling the commitment and deliver the agreed results
- Attending all agile ceremonies
- Be self-organized and giving updates of work progress

PAIN POINTS

1. Working quickly and under short timelines
2. Poor planning and large backlog
3. Churning work between sprints

B

Marcus

Product Owner

ABOUT

Age: 26
Archetype: The Catalyst

Marcus enjoys his job but does not let it take over his life. At work he is always available to help and engaging with his team. Although he sometimes he struggles to stay organized he is has great communication skills and is very knowledgeable about the projects he is leading. Marcus spends his weekend playing team sports.

RESPONSIBILITIES

- Convey the vision of the stakeholders to the team
- Authority to alter the scope of the project
- Responsible for the return on investment (ROI)
- Communicate progress and problems with everyone

PAIN POINTS

1. Keeping the vision of the product
2. Ability to meet deadlines
3. Differentiating needs from wants

C

Annie

Scrum Master

ABOUT

Age: 33
Archetype: Servant Leadership

Annie is a natural leader who is good at solving problems. She doesn't mind making executive decisions and keeping every team on track throughout the progress of a project. If anyone has an issue that needs help resolving Annie is always around to listen. During her free time she enjoys hiking and new cuisine.

RESPONSIBILITIES

- Maintains working conditions for the team
- Addressing roadblocks, impediments, or problems
- Enforcing scrum ceremonies and processes
- Keeps the scope of projects on track

PAIN POINTS

1. Managing role expectations
2. Keeping work time-boxed within sprints
3. Handing urgent change requests

D

Joe

Stakeholder

ABOUT

Age: 53
Archetype: The Boss

Joe is a passionate and experienced businessman. Although he spends the majority of his time traveling around for work, he still tries to stay in communicaiton with his projects. With a positive attitude he finds that he can better support and assist the project. When Joe gets time off, he enjoys studying astronomy and fishing.

RESPONSIBILITIES

- Share details of projects and voices, concerns, and desires
- Provide input to queries on a regular basis
- Prioritizing the work to ensure product development
- Give and receive updates regarding changes in the plan

PAIN POINTS

1. How to tackle a new product
2. Understanding the product success in the market
3. Enough budget for the amount of work and time

Scenarios

"A scenario is a narrative that explores the future use of a product from a user's point of view, helping design teams reason about its place in a person's day-to-day life" (Hanington, B. and Martin, B. 2012, p.152).

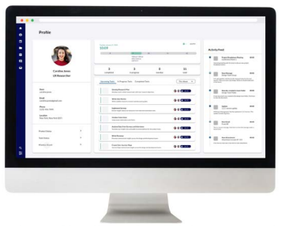
A regular day in the office in an Agile work environment begins with daily stand-ups, where everyone in the office comes together for a quick discussion about what their task plans are for the day and any roadblocks they might have. The rest of the day is about completing the tasks they committed to, office meetings, and other Agile Ceremonies.

As a team member, Caroline (Figure 10.21) tracks her time on a day-to-day basis. Her Product Owner, Marcus (Figure 10.22), tracks his work progress and the progress of his team every day to make sure everything is on track as predicted. Annie (Figure 10.23), the Scrum Master, makes sure all of the teams and products are on track by monitoring the current and future projections of the viability of a product concerning the completion of tasks by the groups.

Figure 10.20 personas (left)
(a) scrum master persona profile
(b) product owner persona profile
(c) contributor on development team persona profile
(d) stakeholder persona profile

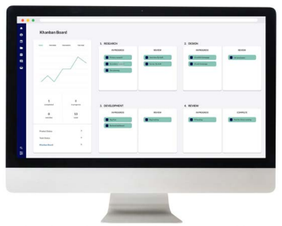
Contributor Scenario

A



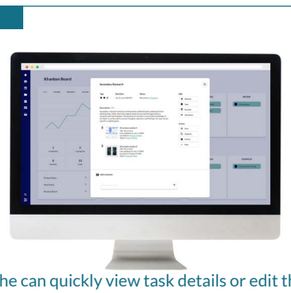
Caroline's profile allows for quick access to her calendar, tasks, and notifications that appear throughout the day.

B



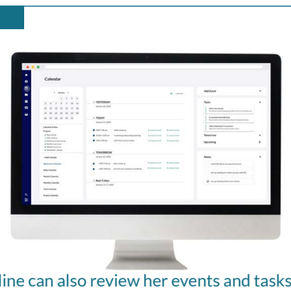
She can check and update the status of her tasks periodically,

C



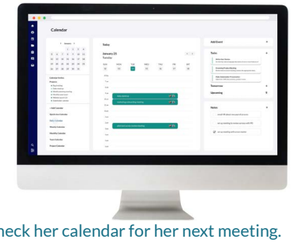
and she can quickly view task details or edit them.

D



Caroline can also review her events and tasks for the next couple of days

E

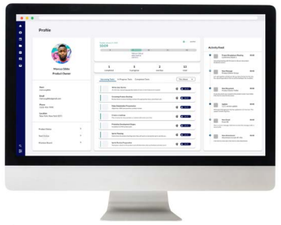


or check her calendar for her next meeting.

Figure 10.21 contributor scenario
(a) profile wireframe
(b) kanban wireframe
(c) task details wireframe
(d) calendar overview wireframe
(e) daily calendar wireframe

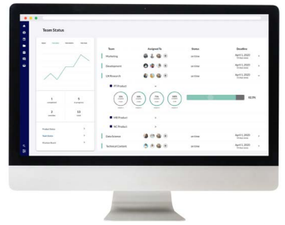
Product Owner Scenario

A



Marcus's profile allows for quick access to his calendar, tasks, and notifications that appear throughout the day.

B

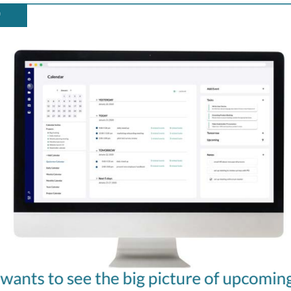


He can check the status and breakdown of his teams work

C

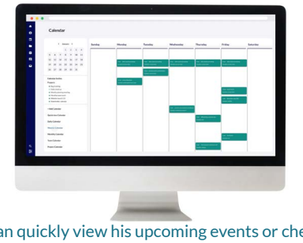
and he can view how many tasks have been completed by each contributor.

D



If he wants to see the big picture of upcoming work,

E

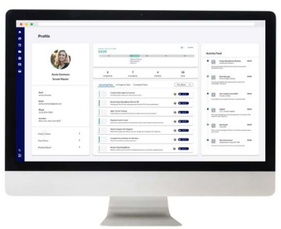


he can quickly view his upcoming events or check the weekly calendar.

Figure 10.22 product owner scenario
(a) profile wireframe
(b) team status wireframe
(c) team status details wireframe
(d) calendar overview wireframe
(e) weekly calendar wireframe

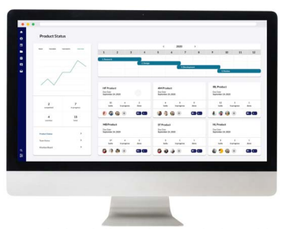
Scrum Master Scenario

A



Annies' profile allows for quick access to her calendar, tasks, and notifications that appear throughout the day.

B

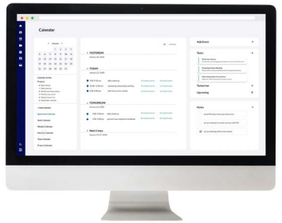


She can track the daily and extended workload of each team,

C

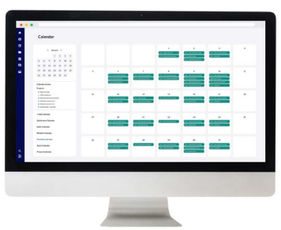
and even monitor the longterm breakdown of each product.

D



If she needs to reevaluate a products timeline, she can quickly view upcoming events

E

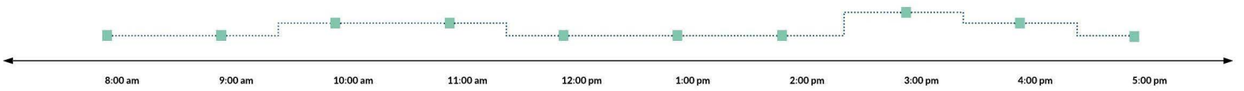


or open the monthly calendar for a more extended view.

Figure 10.23 scrum master scenario
(a) profile wireframe
(b) product status wireframe
(c) product status details wireframe
(d) calendar overview wireframe
(e) monthly calendar wireframe

User Journey Map

"A user journey map is a visualization of the experiences people have when interacting with a product or service so that each moment can be individually evaluated and improved" (Hanington, B. and Martin, B. 2012, p.196). To help identify specific moments of design intervention, I created two different experiences. One mapped out the background of each persona throughout the day (Figure 10.24a), and the other traced the team's day during a Sprint change (Figure 10.24b). Through each of these journeys, I wanted to directly compare how each of the personas interacts with each other.



All

8:00 Arrives to work.

CONTEXT
Everyone arrives to work, knowing that their day will be full of meetings and not much work time.

All

9:00 Begins working on tasks.

CONTEXT
For the free time they do have, they will begin working on tasks in the new sprint.

All

10:00-12:00 Team reviews are conducted.

CONTEXT
Reviews are an agile ceremony where the team comes together and has a short show/tell of major tasks they accomplished the duration of the sprint. This is a good opportunity for the stakeholders to see what is happening with the product.

All

12:00 Goes out to lunch.

CONTEXT
The team usually goes out to lunch as a group. Mexican on Tuesday's is popular because of the $2 tacos. Lunch is always a good time to bond with the team.

All

1:00-3:00 Continues working.

CONTEXT
After lunch everyone has some time to continue working on their tasks in the new sprint, while the scrum master prepares for the next agile ceremonies.

All

3:00 Team retrospective meeting.

CONTEXT
The next agile ceremony is called retorspective and it is a time where everyone in the office gathers and has an open discussion about the last sprint. Things they want to keep doing and things they want to change. Or shoutouts to specific people.

All

4:00 Individual commit to tasks for next sprint.

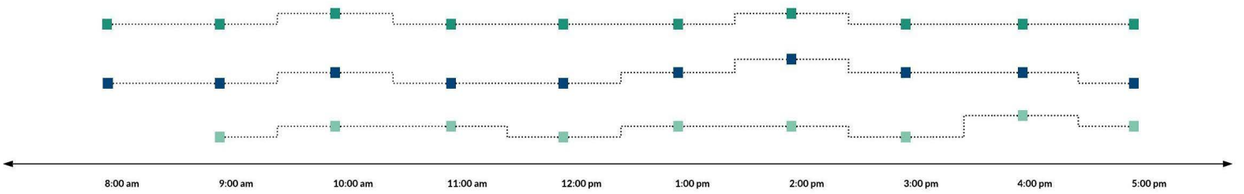
CONTEXT
The last ceremony is called commitment. This is the chance for the SM, PO, and contributor to sit down together and commit to the tasks that the contributor plans to accomplish the next sprint.

All

5:00 Sprint ends and another cycle begins. Leaves the office for the day.

CONTEXT
Once all of the agile ceremonies are completed, most poeple go home because these days are long and exhausting.

Figure 10.24
user journey maps
(a) sprint day
(b) (right) a day in the life of each persona



SCRUM MASTER

8:00

9:00 Arrives to work later in the morning and checks email.

10:00 Plans own day, submits tasks on the office PM tool. Also, prepares general announcements, for the scrum meeting.

11:00 Runs the daily team scrum meeting(s).

12:00 Goes out to lunch.

1:00 Works on planned task(s) for the day.

2:00 Fixes roadblocks for contributors.

3:00 Continues to work on planned task(s) for the day.

4:00 Tries to finish working on tasks for the day and continues to fix roadblocks for contributors.

5:00 Usually stays later after everyone leaves the office for the day to get some uninterrupted work time in.

PRODUCT OWNER

8:00 Arrives to work. Reviews task(s) completed yesterday and plans task(s) for the day.

9:00 Submits tasks on the office PM tool. Checks in on the progress of the project.

10:00 Syncs with all team members and begins working on task(s).

11:00 Attends the daily team scrum meeting.

12:00 Goes out to lunch.

1:00 Works on planned task(s) for the day - usually is distrupted with questions.

2:00 Virtual meeting with stakeholders or developers, etc.

3:00 Unplanned meetings with team members. Continues to work on planned task(s) for the day.

4:00 Then finishes working on planned task(s) for the day. Anything not finished will roll over.

5:00 Leaves the office for the day. Sometimes will attend a call late evening.

CONTRIBUTOR

8:00 Arrives to work. Reviews task(s) completed yesterday and plans task(s) for the day. Leaving some spare time for any disruptions.

9:00 Submits tasks on the office PM tool. Checks in on the progress of the project(s).

10:00 Begins working on planned tasks for the day. Sync with the Product Owner.

11:00 Attends the daily team scrum meeting(s).

12:00 Goes out to lunch.

1:00 Works on planned task(s) for the day.

2:00 Attends an unplanned meeting.

3:00 Continues to work on planned task(s) for the day.

4:00 Takes a break to chat with people in the office. Then finishes working on planned tasks for the day.

5:00 Leaves the office for the day.

SCRUM MASTER CONTEXT

On most days Annie can afford to show up later in the morning because a lot of her work depends on the teams needs. Usually her morning is spent preparing for the team scrum meetings that she leads. This can be stressful because as she is preparing for the scrum meetings she is already getting asked questions. After lunch, is usually a chaotic time because Annie will spend the majority of her time addressing roadblocks for contributors that need help and getting disrupted for questions and assistance of different tasks. Once people start leaving they day slows down for her because she can get to work on anything they did not get to during the day. However, there is always something to do so she consistently leaves work for the day with incomplete tasks.

PRODUCT OWNER CONTEXT

In the morning Marcus walks into work, sits down, checks his email, and submit his task(s) on the office PM tool. Then they will sync with each contributor making sure they have everything they need to get their tasks done. The mornings are usually laid back unless there are ticket items that need to be done quickly and unexpectedly. If that is the case, the day will usually go by quickly because there is a lot to take care of. After the scrum meeting, Marcus spends his time working on his own tasks, having meetings, and answering any questions the contributors have throughout the day. Most afternoons are disrupted from questions or addressing issues that have come up to keep the project on track. On busy days, he may have meetings or calls in the evening that they can take from home.

CONTRIBUTOR CONTEXT

The first thing Caroline does in the morning is decide what task(s) in her sprint she wants to work on for the day. Once she chooses what task(s) she will work on she submits them on the office PM tool. The tool will record their tasks and the other team members. Caroline begins working on her task and might have a quick sync with Marcus checking to see if each other needs to take care of anything in particular that day. After the scrum meeting and lunch Marcus comes up to Caroline and askes her to attend a meeting for a project he wants her to join. Caroline nervously arrives at the meeting, because she has other tasks to get done today. She takes notes on the office PM tool for team reference later. Back at her desk she continues work on her planned tasks. She ends her day by closing her tasks in the office PM tool. If anything is unfinshed, she notes it and will continue her work first thing in the morning the next day.

05 STUDIES

Study Overview

THOUGHT PROCESS
Through my research and exploration, I quickly came to realize that the essential part of my studies was about time, specifically time management. I began thinking about time and how it is measured and read in the form of a straight line (like a timeline), but it is also cyclical, and just like a line, you can take it from both ends and create a circle. So I questioned how I can give time a dimensional form and what expanding and contracting specific moments in time or zoomed-in time looks like as a visual form.

TIME
I read a journal article written by Elaine Yakura that described timelines as being a measure of work progress and performance. Standard functions of timelines include the need for schedules, synchronization, and allocation. They are prominently used in the implementation of large information systems and are “crucial in managing complex projects and coordinating the activities of consultants, clients, users, and other participants” (Yakura, 2002, p.957). The way I was being guided through time is from the Agile mindset of work being broken down into weekly Sprints. Through my studies, I investigated how time can expand and contract, and visualize the big picture and specific moments. I explored how time can be interactive with a Project Management Tool setting while also being understandable, flexible, and adaptable — all qualities of Agile.

BOUNDARY
As the essence of time revealed itself, so did the concept of boundary objects. A portion of my discovery during my research was around boundary objects and boundary infrastructures. It was important to realize that multiple boundary infrastructures could reside within a single boundary object. A boundary object acts as an anchor. It points to how humans can work cooperatively without unanimity. A boundary infrastructure is something that is just there. It is entirely transparent. (Bowker et al., 2016). Boundary infrastructures do the work that is required to keep things moving forward. They deal within the networks of boundary objects, which means that infrastructures are flexible within structures that form tools (Bowker and Star, 2000). They are not

easily noticeable because they are used in everyday life and are built into systems that we use daily.

Boundary objects can be found within timelines, for example, milestone charts as visions of performance, because “boundary objects are the practical artifacts that allow diverse groups to work together. They provide a locus for communication, conflict, and coordination” (Yakura, 2002, p.968). Through boundary objects, time can be created through temporal boundary objects. Temporal boundary objects “are essentially narrative representations that allow diverse groups to fill in content and interpretations and negotiate as they see fit” (Yakura, 2002, p.967). Through my studies, I investigated boundary objects and how boundary infrastructures make up a boundary object. I explored different ways I could use these boundaries to design better tools used to support the Agile Method in ways that zoom into specific moments within a project.

SCENARIO and THREADING

In preparation for the studies, I created personas, scenarios, and user journey maps to help narrow my exploration. I also had multiple interviews to gain insights into positions and perceptions of individuals’ experiences that I could draw from later. I used the scenarios as a guide for my design process by creating instances of ‘pluritemporalism’ which is “the side by side existence of many different types of time, socially constructed out of diverse human experiences” (Yakura, 2002, p.957). I wanted to visually create a timeline of a scenario (another kind of timeline) to show the movement of specific moments in time and specific features that distinguish timelines as temporal boundary objects — creating a “visual means of comparing the actual and planned progress of a project over time” (Yakura, 2002, p.958). Through my studies, I wanted to thread-specific variables of Agile together through the representation of zoomed-in moments. The idea was to capture keyframes just as one could visualize as a roll of film — frozen motions of specific moments.

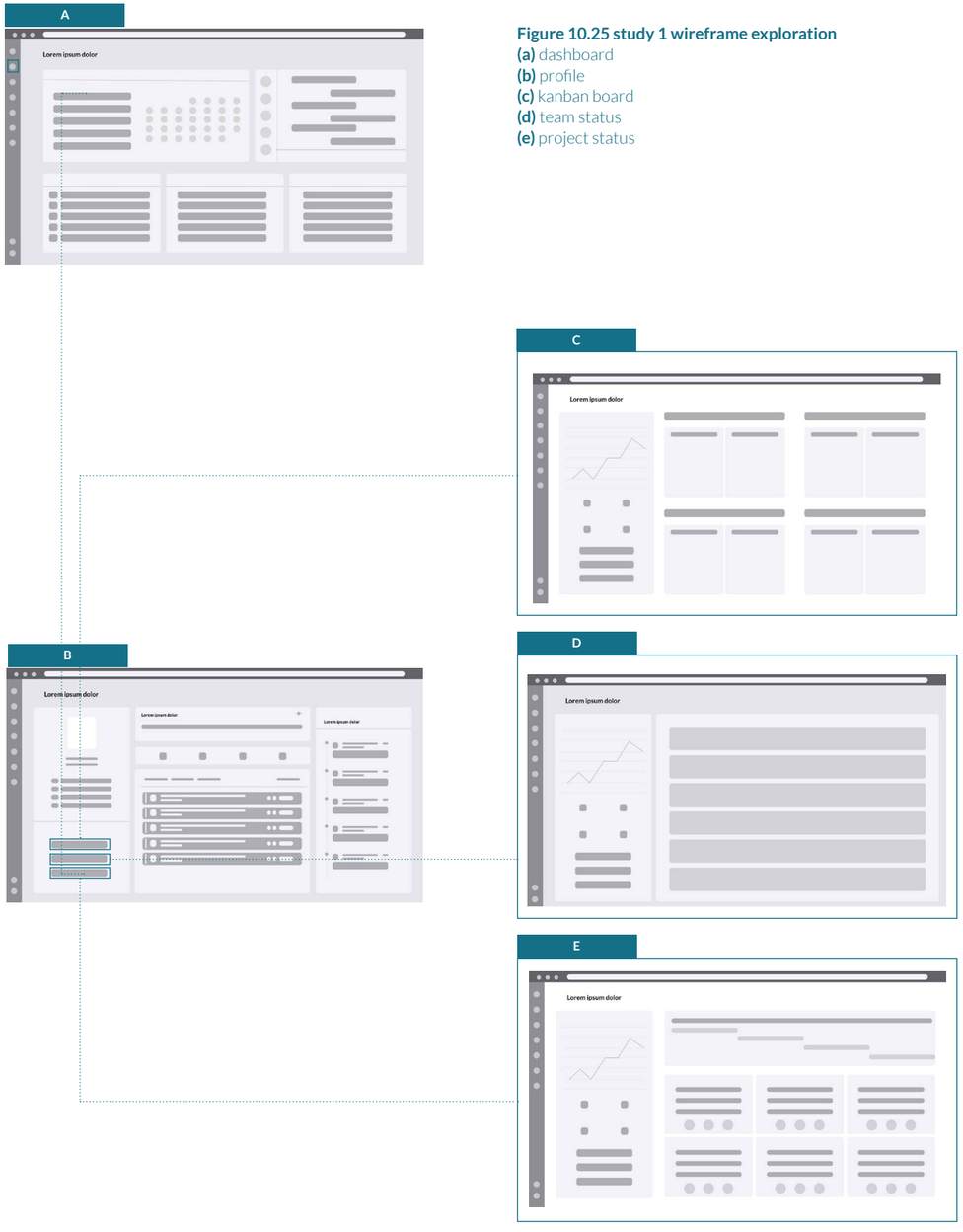


Figure 10.25 study 1 wireframe exploration
(a) dashboard
(b) profile
(c) kanban board
(d) team status
(e) project status

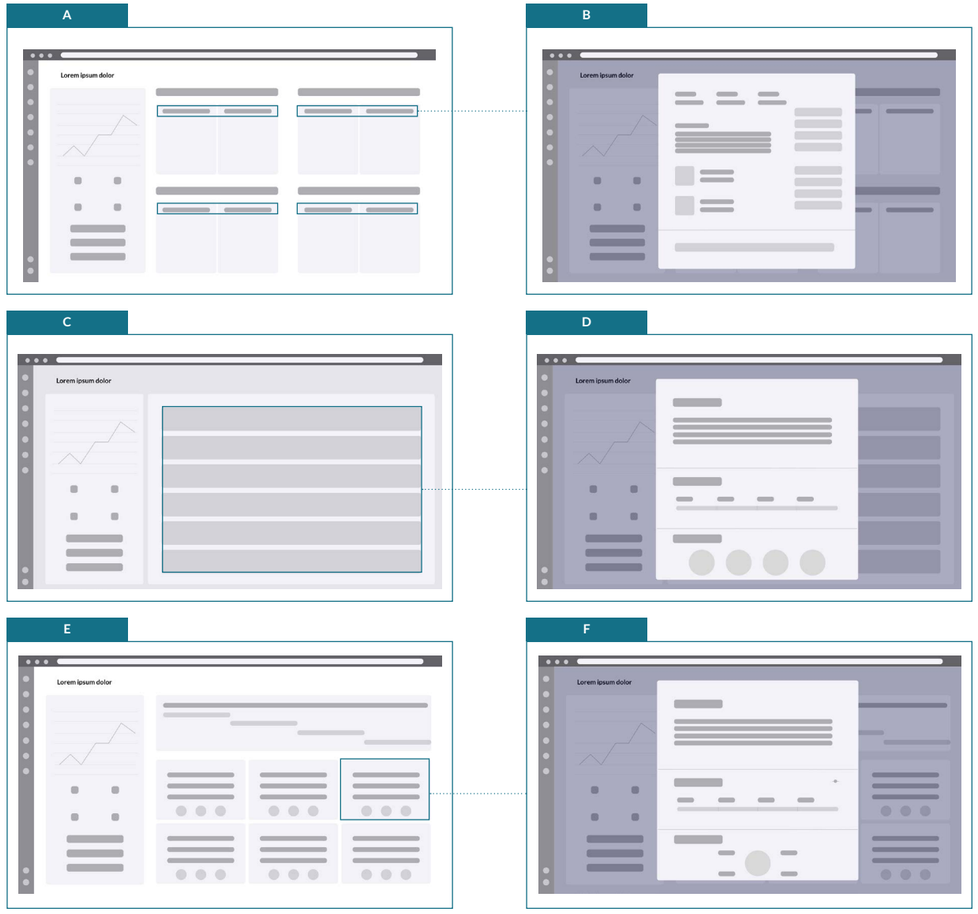


Figure 10.26 study 2 wireframe exploration
(a) kanban board
(b) quick view task details
(c) team status
(d) quick view team details
(e) product status
(f) quick view product status

Figure 10.27 study 3 wireframe exploration
(a) dashboard
(b) day calendar
(c) week calendar
(d) month calendar

Study Set 1 - Transparency

SQ 1: How can a single project management tool be used to treat multiple work situations simultaneously?

Through this design exploration, I investigated how time is transparent. As I approached time through this part of the investigation, "timelines capitalize on the obviousness provided by their visibility as well as on people's ability to supply narrative structure to static images" (Yakura, 2002, p.958). I wanted to design something that was not so obvious but was functional, readable, and more interactive with the users. I was trying to develop around the idea that Agile is supposed to be a transparent working method where different users need different information about the same project to get their job done.

Study Set 2 - Adaption

SQ2: How can a project management tool scale the representation of time by expanding and contracting specific moments throughout a team project?

Through this design exploration, I investigated how time can adapt by expanding and contracting moments. As I approached time through this part of the investigation, I realized that "Timelines set the expectation of a definite predictable conclusion. They are intended to be the roadmap by which participants navigate a complex set of interdependent tasks" (Yakura, 2002, p.959). People use these charts to fill in their understanding of what will happen, even when the future is uncertain and unpredictable. So I was challenged to step away from the grids and structure and transitional design moments that were more dynamic and ever-changing.

Study Set 3 - Inspection

SQ3: How can a project management tool enable perpetual modifications during all stages of a project?

Through this design exploration, I investigated how a project is seen over time. As I approached time through this part of the investigation, I read that:

> "Although the image of timeline refits and provides a sense of concreteness, each participant in a project is free to interpret the timeline from his or her own perspective and to fill in the gaps in different ways. This combination of concreteness and flexibility is critical to the operation of a timeline as a boundary object of different subcultures and communities" (Yakura, 2002, p.959).

I was prompted to explore the concept of rewinding time or looking back through time and how that reflects the past and can help guide change for the future of projects.

06 DISCUSSION

Design Principles

I began my investigation by asking the question: How can the design of a Project Management Tool support varied interactions through the interface within cross functioning teams to track project workflow in an Agile workplace environment?

My sub-questions focused on three different points of intervention within Agile:

- Transparency
- Adaption
- Inspection

I first created states of time — measuring a day by morning and evening, measuring a month by weeks within the month, and measuring a year or more. Then the sub-questions became points of intervention as a starting point for my investigation, but through the examination of my studies, I also discovered more moments to intervene.

For the system to come together, I designed a 'live' dashboard that offered quick access to specific Agile moments within a day, such as a primary calendar with upcoming events, instant messaging between the team, project statuses, notes to self, and notifications. Every user's dashboard (Figure 10.28) is custom to that specific user, and it is the main access point for my designed points of intervention.

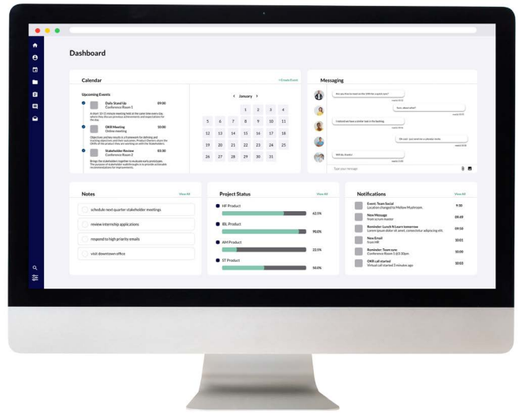


Figure 10.28
dashboard user interface

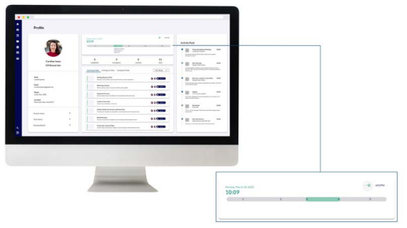
SQ 1 OUTCOME

After I discovered that current Project Management Tools used cannot support multiple work situations simultaneously, I designed a quick access dashboard where each Agile role could customize and work with for their daily needs. This idea addressed the interview comment on having a tool that is more interactive and 'live.' I also designed a profile page that was specific to each user. One of the comments I had from my interviews was the desire to see personal tasks and stats without the help of the Scrum Master. With the support of an existing Project Management Tool, these global and local hubs become points of intervention supporting independent work and time management.

STUDY 1.1

A

B

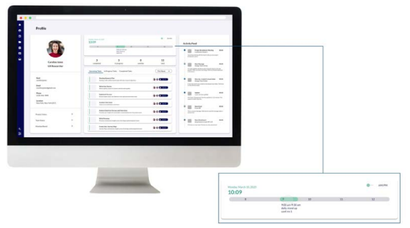


From the dashboard, the user can toggle between morning and afternoon events with the calendar's quick view.

Figure 10.29 Study 1.1
(a) morning quick view calendar toggle from profile
(b) afternoon quick view calendar toggle from profile

STUDY 1.2

A



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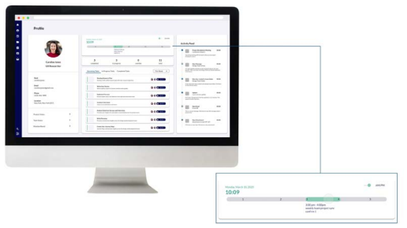


If the user has events, they can hover over the blocks of time to get a glimpse of the event details.

Figure 10.30 study 1.2
(a) morning quick view calendar hover from profile
(b) afternoon quick view calendar hover from profile

SQ 2 OUTCOME
When I realized that time was the defining element of a product's life cycle, I also realized that it was necessary to have the ability to scale the representation of time by expanding and contracting specific moments throughout a team project. Although some existing Project Management Tools offer similar options, they were not easily accessible, understandable, or easy to go back to. In response, I designed transparent artifacts that represent specific moments in time. These particular moments in time can be as small as task details, which can expand into a project summary or a monthly overview of a product contracting back to weekly task summaries.

STUDY 2.1

A

B

C

D

The user can review the individual's progress of completed tasks in a project, by toggling through the different weeks in a month.

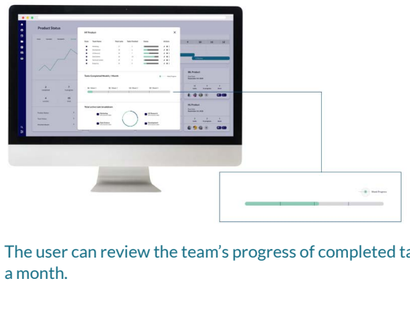
Figure 10.31 study 2.1
(a) UI of completed individual tasks in a project week 1
(b) UI of completed individual tasks in a project week 2
(c) UI of completed individual tasks in a project week 3
(d) UI of completed individual tasks in a project week 4

STUDY 2.2

A

B

C



D

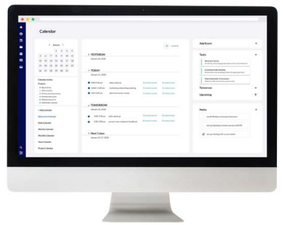
The user can review the team's progress of completed tasks in a project, by toggling through the different weeks in a month.

Figure 10.32 study 2.2
(a) UI of completed team tasks in a project week 1
(b) UI of completed team tasks in a project week 2
(c) UI of completed team tasks in a project week 3
(d) UI of completed team tasks in a project week 4

SQ 3 OUTCOME
The third outcome is designed-depicted moments in support of timelines for scenarios of Agile roles. While taking the other moments of subquestion one and two into consideration, I designed outcomes that became the result of each participant's interpretation of a project's timeline based on their work. I explored moments of design intervention where I could use the calendar as a boundary object to look back or forward through moments in time. Hence, enabling permanent modifications during all stages of a project in support of the idea that everyone works at their own pace, even when the end goal is the same.

STUDY 3.1

A



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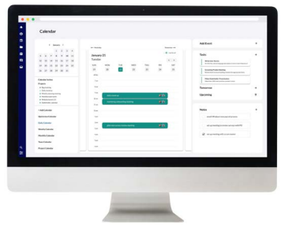
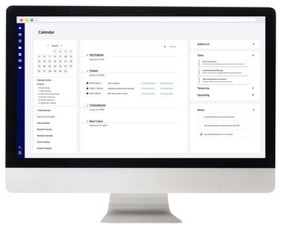


The user has a quick view calendar where they can toggle between a list view and a scroll view.

Figure 10.33 study 3.1
(a) UI calendar list view
(b) UI calendar scroll view

STUDY 3.2

A



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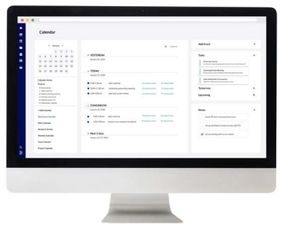

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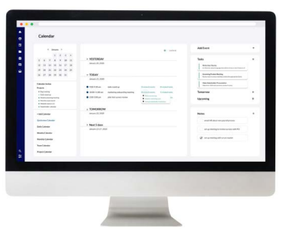
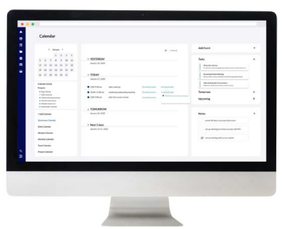


D

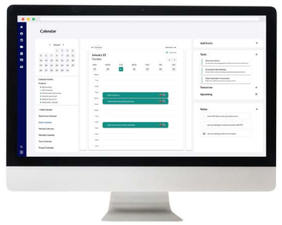


The list view allows the user to quickly expand and contract events from yesterday, today, tomorrow, and the next 5 days. It also gives them quick access links to related events and tasks.

Figure 10.34 study 3.2
(a) minimized view of tomorrow events
(b) expanded view of tomorrow events
(c) today's view when hover of related events
(d) today's view when hover of related tasks

STUDY 3.3

A



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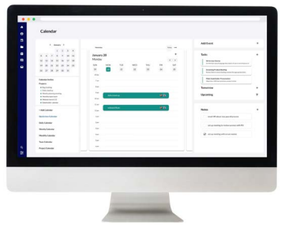

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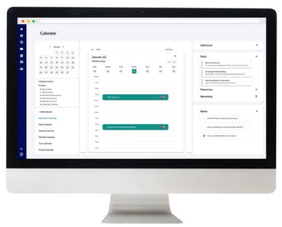

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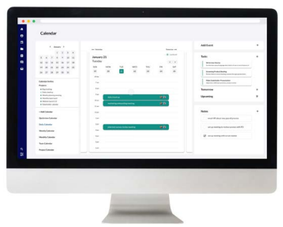
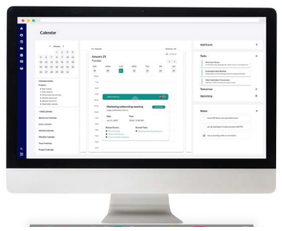


E



The scroll view lets the user swipe or click between yesterday, today, and tomorrow. The user can also hover over events to view details such as related events or tasks.

Figure 10.35 study 3.3
(a) click to yesterday's series of events
(b) click to today's series of events
(c) click to tomorrow's series of events
(d) today's series of events without hover
(e) today's series of events with hover

Future Work

My research is just the beginning of a problem space that is actively growing in the workplace right now. In the context of an Agile workplace environment, there are many opportunities for continued exploration and design intervention. As I continue my investigation of Project Management Tools and time management, there are other factors that I would want to address:

EXPANDED DEMOGRAPHIC
One area of interest that I came across during my research was specifically focused on the Agile Method within a design space. I want to explore if and how Project Management Software can adapt to a company's design structure. I am curious to know if there is a correlation between different Agile forms depending on the business model that they follow.

TYPES OF WORK ENVIRONMENTS
I also considered if the actual layout of an office space can affect how Agile is run. I would question factors such as productivity and innovation specifically reliant on the placement of departments or such within a workplace environment. I would look into the productivity of working in an open space versus a secluded area in regards to running under the Agile Methodology where communication is necessary.

USER TESTING
While I had prototypes to conduct some minimal testing, the next steps of my research would have fully functioning prototypes, including an interactive Project Management Tool. Ideally, I would like to take this prototype back to the people I interviewed at the beginning of my research. It would be interesting to have feedback from their insights comparatively to how they are interacting with the prototype. Also, testing within a larger team setting would be essential to see how timelines can stand the test of time.

MESHING DESIGN PROCESS AND AGILE METHOD
The topic of meshing the design process and the Agile Method came up a couple of times during my research. I did not look into it much, but I did consider what it would look like if implemented into the Kanban boards. Future investigation into this realm would

include learning more about the similarities and differences of each of the processes and then find intervention points where they could hybrid together.

ADDITIONAL RESEARCH
Furthermore, I would be interested in researching a more cognitive view on the measurement of time and how it can affect productivity from an individual level to a team level. Perhaps then, a Project Management Tool can measure different velocities of time and calculate better big picture goals. I would also look into cognitive loads and the visuals between patterns and textures to visualize information. Right now, I envision the patterns and textures incorporated into how the user interface visualizes in progress and finished tasks. However, in the later stages of research and development, I also would consider creating a visual vocabulary from patterns and textures throughout the entire interface as a response to design intervention.

Conclusion

Throughout this investigation, I developed features that can be implemented into existing Project Management Tools. These features bring elements like interactivity and accountability that weren't there before with the focus of time management, which could be useful for everyone in the workplace. The research and exploration led me to these conclusions:

TIME
I realized that project management is not just a system for managing projects. Project management is time management. The goal is to achieve tasks within a constraint; hence you need to be able to manage time.

BOUNDARY OBJECTS
I learned that boundary objects are supporters. Their job is to be functional entities rather than attractive ones. They can be simple, and they are usually just reasonable enough, so they do not stick out, but still get praise for getting the job done.

LIFE REALIZATIONS
Everything that happens in a moment affects what happens next for you and for others you encounter after. The result is not about whether it is good or bad; it's about what you do in reaction to get to the outcome.

AGILE IS NOT AS ALIEN AS IT SEEMS
Although Agile comes with structured activities and lots of terms and practices, humans have a natural tendency to perform Agile tasks, and the Agile Method can be implemented in home situations.

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APPENDICES

A - Planned Interview Questions

“Interviews are a fundamental research method for direct contact with participants, to collect firsthand personal accounts of experience, opinions, attitudes, and perceptions” (Hanington, B. and Martin, B. 2012).

EVERYONE

- Tell me about your job. What do you do?
- Does your company run under the Agile Method ?
- Does your company use a Project Management Software? If so, what and how.
- What PMS do you use at work? Do you like it? Talk about the advantages and disadvantages.
- Share your experience as an Agile Team member or Project Manager. What does the Agile Method look like at your place of employment?
- How do you track versions of a project task? Like project history.
- Are there any features or changes to PMS that you would make in order to make your job easier? Or that would help the overall team collaborate better?
- Design your ideal Project Management Tool. What are some of the main features you would have on it.

SCRUM MASTER or PROJECT MANAGER

- When should you use Agile?
- What is the Scrum process? How is Scrum different from Waterfall?
- What are some Project Management Software precedents that you would recommend or like? Why?
- Do Stakeholders have accounts in Jira, or accessibility to view project progress? Is that something they like or want to see?
- Does your back end of PMS look different than the user team views?
- How do you influence and motivate a team to use Scrum? How do you spread an Agile mindset?
- What would you do to make sure the Scrum process is being applied? How do you manage risks in Scrum projects?
- What would you do to help the team achieve success?
- What are the Scrum ceremonies? How do you organize them?

PRODUCT OWNER

- How do you manage: projects and teams (remote or outsourced)
- How do you communicate? How do you lead your team, talk to them?
- Does your back end of Project Management Software look different than the user team views?

- How do you know the project is off-track? And how do you get it back on track?
- How you address individuals who are not doing their full potential. Is it measured somehow?
- How do you prioritize? Do you delegate work?

DEVELOPMENT TEAM

- Do you use other software besides the “required” one that is used along the entire team?
- Why was the Agile Method designed for Software Development? Do you find it difficult to be x and work under the method?
- How do you work together with the Scrum Master or Product Owner?
- How do you see your role in Scrum Ceremonies (Sprint Planning, Daily Scrum, Sprint Review, Sprint Retrospective)?

B - Agile Manifesto

We are uncovering better ways of developing software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools.
Working software over comprehensive documentation.
Customer collaboration over contract negotiation.
Responding to change over following a plan.

That is, while there is value in the items on the right, we value the items on the left more.

We follow these principles:
Our highest priority is to satisfy the customer
through early and continuous delivery
of valuable software.
Welcome changing requirements, even late in
development. Agile processes harness change for
the customer’s competitive advantage.
Deliver working software frequently, from a
couple of weeks to a couple of months, with a
preference to the shorter timescale.
Business people and developers must work
together daily throughout the project.
Build projects around motivated individuals.
Give them the environment and support they need,
and trust them to get the job done.
The most efficient and effective method of
conveying information to and within a development
team is face-to-face conversation.
Working software is the primary measure of progress.
Agile processes promote sustainable development.
The sponsors, developers, and users should be able
to maintain a constant pace indefinitely.
Continuous attention to technical excellence
and good design enhances agility.
Simplicity--the art of maximizing the amount
of work not done--is essential.
The best architectures, requirements, and designs
emerge from self-organizing teams.
At regular intervals, the team reflects on how
to become more effective, then tunes and adjusts
its behavior accordingly.
(Manifesto for Agile Software Development, 2001)