Successful Collaboration in an Agile Framework

By

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Introduction

Agile is a project management framework that allows development teams to create software solutions iteratively and incrementally. An Agile framework is iterative, because it allows teams to explore solutions and adapt the direction of the solution based on the knowledge acquired from exploration. An Agile framework is incremental because it forces a development team to focus on solving a set of problems that are related before moving on to another set of problems.

Agile developed in the early 1990's as a reaction to prescriptive or linear project management frameworks, such as waterfall project management. Since the inception of Agile, many variations of project management framework have been developed. The variations of Agile present practitioners many options for choosing an appropriate style of Agile for a given team. However varied these frameworks may be in specific practices, all variations of Agile are iterative and incremental. In addition to a common life cycle for product development, the core values of each variation are the same.

The core values for an Agile framework were established in February 2001, when 17 practitioners from various styles of Agile project management came together to establish a common understanding of what it meant to practice Agile Development. Below is the list of four core values that the Agile Alliance developed. The Agile Alliance acknowledges that although there is value in the items on the right, the Agile Alliance values the items on the left greater.

Agile Core Values		
Individuals and interactions	over	processes and tools
Working products	over	comprehensive documentation
Customer collaboration	over	contract negotiations
Responding to change	over	following a plan

Since the creation of the Agile manifesto, a community has grown around the methodology. This community includes 5651 members from the Agile Alliance and the Scrum alliance has 13 regional working groups in the US and 27 working groups worldwide, with working groups represented on six continents.

Agile framework was created to help teams deliver innovative projects in a way that forces collaborators to come together at all phases of product development process to create design solutions. There are several variations of Agile frameworks, such as Extreme Programming, Scrum, and Feature Driven Development. Jim Highsmith, a member of the original 17 that established the core values of Agile, has created an Agile Project Management (APM) framework that consists of 5 phases. Highsmith notes that Agile is not a sequential series of steps to be followed in linear fashion, the phases to should be considered fluid.

The five phases of APM framework are:

Envision – Determine product vision, project scope, project team, how team will work together.

Speculate – Replaces planning, plan associated with prediction and relative certainty. Speculate communicates more uncertainty. Speculate and adapt over plan and build.

Explore – With iterative style used to answer questions from speculation. Exploring handles uncertainty rather than determine execution.

Adapt – Review results, status, team performance and adapt as necessary.

Close – Conclude project, pass along key lessons and celebrate

Iterative and incremental development methodologies are not new ways of working. Forms of iterative and incremental methodologies have been around since the 1940's and possibly earlier. Agile was developed from the practitioners who believed that a linear method of working from requirements to solution realization did not allow project teams to adapt solutions from knowledge that developed as teams worked toward realizing the solution.

Even with the momentum that Agile has generated in software development, the standard methodology of working is primarily a linear process. Highsmith suggests prescriptive processes may be preferred because they are perceived to be repeatable and predictable. While Agile may not guarantee repeatable success for all development projects, Agile is reliable for creating new and innovative solutions (Highsmith 2004). An Agile framework is useful for developing innovative solutions because of the iterative and incremental practices. At the heart of the iterative and incremental practices in the core values of Agile.

The focus of this study is to understand the essence of the successful collaboration in an Agile framework from the experiences of several Agile practitioners. Agile

practitioners were interviewed to understand their beliefs of what is necessary to successfully collaborate to develop software solutions. This study compares the interview responses collected to the core values of Agile. If the values are as important as originally stated, the responses based on participant experience should be consistent with the core values that were established by the Agile Alliance.

Review of literature

The literature reviewed consists of 3 case studies focused on collaboration in the different implementations of an Agile methodology. The literature was chosen for examples displayed of teams' success dependent on working from the core values of Agile.

Collaboration and co-ordination in mature eXtreme programming teams

Sharp and Robinson observed that Agile teams rely on story cards and a project wall to help them co-ordinate and collaborate on activities (Sharp and Robinson 2008). The story cards record what the team needs to accomplish and who is responsible for completing the necessary tasks. The wall is physical space used to organize and display the story cards. Essentially, the wall presents an overview of all activities to be completed for a project and the story cards are the specific details of each activity. The case study observes three Agile teams and their experiences with the story cards and the wall. Sharp and Robinson present how the three different teams experienced similar benefits by utilizing the two artifacts.

The case studies presented by Sharp and Robinson are good examples of how successful teams value individuals and interactions over processes and tools. The processes and tools used for managing and discussing activities were important to the project, but not as important as the activities that individuals engaged in while team members came together to discuss the activities on the story cards and the wall. The teams were able to hold meetings around the wall and use relevant story cards as an informal facilitator of the group discussions. Individuals were able to give updates on status of activities and answer questions of one another. The teams did utilize Agile practices, such as a stand-up status discussion, and utilized the tools of the cards and the wall, but the success of the team's ability to collaborate is based on the individuals interacting together in a way that fosters effective communication and understanding.

Another value illustrated in Sharp and Robinson's study is the working products over comprehensive documentation. Teams focused on activities to deliver working segments of software, more so than documenting the work to be done in great detail. The wall and story cards are the documentation. These forms of documentation are easy to work with and are easy to update. Individuals use the cards to discuss the work that has been completed or needs to be done. The story cards communicate who to speak with to learn more about an area of the project. Story cards were easily updated at the end of team meetings if status of an activity or the desired outcome of an activity had changed.

An institutional analysis of software teams

Tenenberg draws from research from experimental economics and natural resource governance to suggest key principles, or rules, for collaboration (Tenenberg 2008). The key principles identified for collaboration are face-to-face communication, repeatability of interactions, mutual, open, and multi-level monitoring, and explicit use or threat of sanctions. Tenenberg suggests that working from the identified principles increased team member's likelihood to contribute to greater good of the team and less free-riding from team members.

In the case study participants on teams of three or four members established their own working agreements and were asked to monitor one another for compliance with the working agreements. In addition to monitoring one another, individuals were able to monitor their own performance to ensure that work was completed in accordance with the expectations of the group. Tenenberg reports that each team successfully achieved the requested milestones of the projects. Of the 114 total milestones accomplished for all teams, sanctions only needed to be enforced on three occasions. In addition to teams successfully self-organizing to complete the work, the teams also reported that teammates on the current project met group commitments significantly more often than teammates in the past.

Tenenberg study illustrates how individuals can come together and establish how to work together, rather than rigidly following a plan. Self-organizing teams are also better able to respond to changes than teams that stick to a plan that was developed

before work began. The team establishes how to work together and the individuals involved can identify and execute how to realize the goals of the team.

In addition to these teams being able to adapt to change, these teams also demonstrate the effectiveness of valuing individuals and interactions over processes and tools. By establishing working agreements for conducting the work the individuals of the team were able to discuss how best to approach a problem rather than adhere to a process that were predetermined for the groups.

The social side of software engineering – A real ad hoc collaboration network

Cherry and Robillard presents a case study that analyzes ad hoc collaborative activities taking place between teammates while developing a software solution in an Agile framework (Cherry and Robillard 2008). Ad hoc conversations are quick conversations that occur spontaneously and involved a team member engaging with others to either learn or share knowledge. The study provides a perspective on how each team member contributes to exchange ideas that provide clarity on the tasks to complete and how to complete the tasks. The ad hoc conversations are less formal than a meeting that must be scheduled, and allows more ideas to emerge from conversation with team members and stakeholders than may occur from linear agendas.

The study finds that the ad hoc conversations are a vital part of project completion. Individuals are able to quickly meet with one another to learn what needs to be done and the best way to complete the work. Cherry and Robillard's study also illustrates

the importance of valuing individuals and interactions over processes and tools. The ad hoc conversations are an informal way for teams to communicate and collaborate. Allowing teams to meet and work quickly and conveniently can be more effective and efficient than adhering to formal processes and tools for establishing solutions.

In addition to individuals working together, the team is also in ongoing conversation with the customers to ensure the team is focused on the right outcomes, instead of relying on thorough contract negotiations before the work begins. Engaging with customers frequently and informally allows for alignment of teams deliverables and stakeholder expectations. In addition to aligning expectations, ad hoc conversations with stakeholders allows the ideas of the stakeholder emerge as the teams understanding of the problem space improves, rather than holding the stakeholders to the requirements that were negotiated at the beginning of the project.

Method

Overview of a Phenomenological study

A Phenomenological study was the approach selected for this study. A Phenomenological study is the understanding of the essence of a lived experience. Participants involved in a phenomenological study must have a personal experience with a phenomenon. Creswell states that in a phenomenological study a researcher first turns to a phenomenon which seriously interests them. In the process the

researchers reflect on essential theme and what constitutes the nature of the lived experience (Creswell 2007).

Research Design

The research problem was identified and questions were developed to better understand the research problem. The intent of the questions was to learn of what made Agile projects successful or unsuccessful for each participant. The questions were kept simple and open ended to collect insights on the context or situations that influence the participant's experiences in Agile projects. To alleviate researcher bias, the personal experiences of the researcher were bracketed. In addition to bracketing personal experience, the literature review was not conducted until after interview data was collected and key themes were identified from participant responses.

Procedure

Participants were sent an invitation to a 45 minute phone interview and consented to participate in the interview. Participants were then provided background on the project and were provided the list of questions and were asked to review the questions before the interview. In addition to reviewing the interview questions, participants were also asked to complete a background questionnaire.

Thirteen interviews were conducted and participants and handwritten notes were recorded for all interviews. In addition to handwritten notes, audio is also available

for some of the interviews. Two participants who could not connect by phone completed and submitted their answers via email.

Sample

Interview participants were identified by consultants that work in APM and Scrum variations of Agile. The consultants were able to provided contact information for the participants of the study. Participants had at least in three years experience with Agile and at least eight years experience in software development. Some participants have published books and journals in Agile. One participant was involved in the original Agile Alliance. Another participant has been credited as an original influence for a few Agile practices. Participants had experience working in several different organizations and domains, as well as working on Agile teams of sizes varying from four to over one hundred team members. Participant's project experience was focused on software or web development projects.

Data Analysis

Once data was collected, responses were organized by question. Responses were tagged with their corresponding participants. Significant statements were identified across questions and meaningful groups were developed amongst the statements. The meaningful groups were organized to establish key themes across the interview questions. The themes that were developed were sent to participants for review. Participants were encouraged to comment or question the themes that were identified.

Results

Eight themes were developed from the interview responses. The themes give textual description of the essence of successful collaboration in an Agile framework. The themes that developed are not necessarily mutually exclusive; there is some overlap across the themes. The themes were not established because they were stated by all participants. Themes were developed based on the meaningful groups that resulted from the significant responses from interviews. The eight themes develop are; Shared Vision, Leadership, Individuals, Facilitation, Teams set up for success, Team Dynamics, Agile is not Perfect, and Nothing Guarantees Success. A brief description of each theme is provided along with supporting quotes from the interviews.

Theme 1 - Shared Vision: Successful Collaboration depends on team members working together to create a shared vision. The Shared vision is a consistent idea amongst the team of what they are trying to achieve and how to accomplish their goal. The goals and work necessary to realize the goals are determined by the team. Teams need to frequently inspect the shared vision and adapt to new knowledge that develops as the team progresses towards realizing goals.

Quotes on Share Vision	Participant
"Successful collaboration is dependent on a group of individuals that come together and create a sufficiently shared understanding of (what is to be achieved) that enables for coordinated behavior…"	LH
"Teams need some outcome or goal that you successfully achieve"	HW
"Teams need goals, a vision, and a light at the end of the tunnel to shoot for. Teams need to make it clear why they are working together."	JL
"To achieve successful collaboration, you have to want to work	SA

together to a shared vision"	
"Successful collaboration depends on making sure everyone is clear and committed to their next steps."	SG
"Teams need to identify and agree on the problems and solutions. Teams may refine as you work towards them"	HW

Theme 2 - Leadership: Leadership is responsible for ensuring that the team

establishes momentum in making progress and that the progress is in line vision

established by the team. If the team is not able to make progress, i.e. dependencies

not being available, or if the team strays from the established vision, a leader is

needed to clear issues to allow the team to continue to work on the correct path.

Quotes need for a leader	Participant
"Teams that successfully collaborate need a person managing the work."	SG
"Scrum master needs to be in place to break down barriers, if you don't have this person contributors can fall apart."	HW
"Team needs someone to filter out the noise."	HW

Leaders then need to be vigilant in doing what is necessary to support the team.

Leaders need to understand the goals that exist for the team and the motivation of the

individual team members. Leaders need to work with the team to help both team and

individual goals to be realized.

Quotes of a leader working with team members	Participant
"Managers should not shove work down the team member's throats"	VD
"Leadership management culture fosters respect, it drives people to collaborate."	JH
"Leader is more a facilitator of team rather than leading, Leader should	JH

use a subtle form of management. Use a light touch, don't force individuals into work."	
"Leaders need to create a win-win situation and perception of fairness"	DC

Agile creates opportunities for team members, who may not be designated leaders, to provide direction based on their knowledge, experience, or skills. Agile fosters these leaders by encouraging the team to self organize and utilize domain experts from various backgrounds at appropriate times.

Quotes on individuals of the team acting as leaders	Participant
"Agile methods promote that individual members of teams identify and generally self-select tasks.	LH
"Unsuccessful collaboration can result from a mismatch of the meta-approach to the primary activities required to identify, decompose, distribute, coordinate, and/or integration of outcomes necessary to realize a successful outcome."	LH

Theme 3 - Individuals: Collaboration is dependent on individuals participating in activities to coordinate and create outcomes that are expected of the team. Individuals need to be motivated and willing to collaborate.

Quotes on attributes for individuals to possess	Participant
"Individuals must possess a good personality."	HW
"Individuals need to make the time to work together."	KC
"Individuals need to show up both physically and mentally to work."	HW
"Individuals must have the intention to collaborate for the effort to be successful."	DC

Individuals are responsible for ensuring the working experience meets personal and team expectations of success. Individuals need to understand their responsibilities and deliver what they commit to produce. Individuals are responsible for their own behavior and how the behavior impacts the success of the team. Some actions that were described that can have a negative impact a teams success are; "arrogance", "showing disrespect", "withholding information", " misleading people", "blaming others". Inactions that can have a negative impact the success of a team are; "not listening", "not doing what will help", "not trying to improve", "not being steadfast", "not willing to admit mistakes", "not taking responsibility for actions"

Quotes on Individuals being responsible for contributions to the team	Participant
"Agile emphasizes an individual team member's responsibility to actively participate in the core activities associated with tasks."	LH
"Individuals need to ask themselves key questions while working with the team; Is this the right thing to do? Am I proud of this? Why are we doing this?"	JL
"Individuals must be open and candid"	VD

Individual's knowledge, or pursuit of knowledge, is more important than years of experience that an individual may possess. Individuals need to strive for continual improvement. Agile allows and requires individuals to learn and improve. Individuals must not misuse power or knowledge.

Quotes on Individuals possessing knowledge and learning on the job	Participant
"Individuals must have a sufficient foundation to enable the activities of work to be engaged."	LH
"Agile supports rapid learning and incremental improvements. It allows individuals to learn on the job. Feedback is rapid and allows individuals to grow in real-time."	DC

"Success is dependent on people who have knowledge and skills to get the job done, or at least where to go and get it or have capacity to learn it"	MG

Theme 4 - Facilitation: Agile and its set of proven practice methods improve the outcomes of individuals better than they might on their own. Proven methods for facilitating collaboration are helpful for teams to communicate and collaborate together at any phase of the process. Facilitation structures provide guidance in decision making and promote communication. Agile is a structure that promotes communication amongst individuals from different backgrounds and experiences. Performing communication and collaboration in an adequately frequent, effective and efficient manner is very important in Agile.

Quotes on the need for good facilitation	Participant
"Activities that structure collaboration are needed to be successful. A facilitator provides structure and goals. In the absence of trust and safety, facilitation can help"	JP
"Agile provides means, motivation, and opportunity for collaboration. You can see more benefit from it, partly due to frequency of the feedback loop is tighter so you can see the benefit sooner."	JP
"Teams need to hold good meetings and manage the time appropriately. Meetings need to have an agenda or structure and the teams need to know the desired outcomes or action items."	SG
"Meetings need to be effective and efficient. Keep them short, so not to waste people's time."	KC
"Agile helps to minimize risk with frequent progress checks, incremental milestones, and showcases."	SG
"Communication is key to collaboration! Agile focuses on communication activities vs. other processes that focus on documents	JL

and deliverables to share knowledge."	
"Successful collaboration depends on activities to get people focused on how to solve a problem. Teams need to determine the methods to use, the acceptable outcomes, and key metrics know when they are done."	MG

Agile is a structure and a set of values that facilitate the work of the team. The structures and values of Agile are flexible for teams to adopt the practices that work best for them.

Quotes on how Agile facilitates collaboration	Participant
"The underlying philosophical foundation of agile promotes collaboration."	SA
"The values of Agile are all about collaboration."	VD
"Agile has the value that emphasizes interactions and communication over documentation and process"	MG

Tools for facilitation, such as a project wall, need to be easily accessible to team members. Agile promotes accessibility to artifacts that help teams get work completed

Quote on facilitation tools	Participant
"Team members need to use simple tools that are accessible to all."	SA

Theme 5 - Team set up for success: Members of teams need to be set up to succeed. Stakeholders need to demonstrate that the team is valued and the team's goals are supported by the business. A prominent way to demonstrate support for an initiative is to assign the right people in the right environment. Some activities that need to take place to set up the team to be successful may be beyond the control of the team.

Quotes on setting a team up for success	Participant
"When you start putting barriers to communication in place, such as not being co-located, being overly specialized, or communicating via documentation, then you run into trouble. If you make it easy and desirable for people to collaborate then they will."	SA
"The right context, environment, organization surrounding the team makes for successful collaboration."	MG
"Agile works when there is a cross functional team in the beginning."	SG
"Need to have the right size team for collaboration, not too big."	MG

Co-locating team members was a common point made by participants as an important element for setting the team up for success. Co-location refers to having the team in a central location, i.e. a project room, where all team members work. A key reason for co-location is the improvements it can make in communication.

Quotes on team members being co-located	Participant
"Teams do best when they are co-located."	JP
"Being able to work face-to-face is key. A lot of information is shared face-to-face. You can tell if you have a person's attention, body language and hand gestures, you can do visual sketches, and it is in real time."	KC
"Organic collaboration can occur more naturally if teams are co-located."	KC

Theme 6: Team dynamics Individuals need to come together as a team. Individuals need to identify with the team and commit to working towards the goals of the team. Agile gets people working together effectively. Core values of agile are focused on developing and strengthen interpersonal cooperation in the process of working together.

Quotes on team dynamics	Participant
"Success is measured by how well aligned team members keep in alignment, from risks to tasks, expectation alignment is big."	KC
"Individuals must trust other parties involved no blame game. Almost like a family."	VD
"The critical issues for collaborating together you need to want to collaborate with one another, that you respect one another, and that you're flexible enough to do so."	SA
"Collaboration drives a group towards building something, better than we could it on our own"	JP
"Teammates need to respect the background and personality of others."	SG
"Teams need to bond as a team; members become comfortable to share ideas without ego, while being honest and open."	MG
"Collaboration is not sharing my idea and learning from your idea, it's the sum of all ideas."	JP

Team goals need to be valued over individual goals, but both should be achieved.

Members of the team should be aware of the goals of other members and work with

them to attain their personal goals.

Quotes on team and individuals goals presence in team dynamics	Participant
"Value is based on each participant definition of value, perception is that everyone is getting a piece of value"	JL
"A successful collaboration is when everyone is satisfied and feels they accomplished their goals and got something out of the experience."	SG
"Incentives, motivations, and support need to be there for people to work together."	MG
"Teammates need to make sure that another member is not just giving lip service to collaboration. Teammates need to watch these people and call them out."	SG
"Teammates need to understand an honor other member's needs."	VD

Theme 7 - Agile is not perfect: Agile is not the only methodology that can result in

successful collaborations or solutions. Agile also does not guarantee success.

Problems can occur in Agile while implementing, integrating, and launching

solutions. Teams can get by without doing all things in Agile and still succeed. For

example, Agile does not explicitly focus on usability or interaction design. Agile does

not explicitly focus on architecture or software long-term.

Quotes on why Agile is not a perfect framework	Participant
"Agile does not ensure good structuring of code."	JC
"Agile's disdain for architecture leads to practices that harm architecture in the long term, and by consequence, that harms collaboration within the team."	JC
"If one considers the scope of collaboration to include not only developers and customers, but users as well, we find other lapses in Agile."	JC

Agile does not address all things necessary for success. Some Agile practices so may

harm collaboration. Some things could be added to improve Agile to improve

collaboration. Some things added to Agile degrade collaboration. Some aspects of

Agile degrade collaboration and would be good to remove from Agile. For example,

Agile focuses on change and can wear down participants. Agile is not focused on

stability.

Quotes on how Agile can degrade collaboration	Participant
"Agile values do not encourage any structuring of collaboration that helps collaboration in the long term."	JC

"About 79% of on-site customer interactions are unnecessary; that wears out the customer and may eventually drive them away, which leaves the collaboration unsuccessful."	JC
"Agile is about embracing change but never about embracing stability."	JC

Theme 8 - Nothing guarantees success: There are no activities that guarantee success.

Many things can cause collaboration to fail. Removing the core values of agile can

almost guarantee a project team will fail to collaborate.

Only one quote was given that specifically addresses the theme of nothing guarantees

success, however, many responses given for what is necessary for success were

preceded with "it depends" or "that's situational".

Quote on how nothing can guarantee success	Participant
"You can never ensure success, only increase its chances."	JC

Discussion

Three key themes from study: Leadership, Individuals, and Facilitation

In this study eight themes developed from the responses collected from the 13

interviews. The themes all provide insights into what can contribute to successful

collaborations. Three themes, Leadership, Individuals, and Facilitation, were

identified as key themes from this study. Shared Vision was consistently reported as

needing to be in place, but the existence of the shared vision is dependent upon the

individuals of the team to work together to define that vision. Leadership is needed to

guide the team towards the vision and make sure the team makes progress in

achieving the vision. Facilitation is necessary for evaluation of the team's progress

and if the current vision is accurate for the team to pursue. Facilitation is also necessary for discussions about the vision and problem solving to realize the vision.

Team dynamics consist of how well individuals work together and how well leadership assists the team in achieving the identified goals. Setting a team up to succeed is a great way to start, though if responsible individuals, strong leadership, or methods for facilitation are in not place, teams with all the necessary skills and resources can fail as well. Setting a team up for success may help chances for success, but motivated individuals, determined leaders and proven methods for facilitation can create successful outcomes even when the team is working in difficult situations.

The fact that Agile is not perfect should not be a surprise. How well the Agile process is carried out is largely dependent on the performance of individuals, leadership, and the methods for facilitation. Individuals need to work together to identify the practices of Agile that are working for them. Teams may need to adapt if Agile creates difficulties that the team is unable to resolve within the framework. There are no mandatory practices of Agile; it is up to the team to determine what works for them and altered the practices that are not yielding positive results.

Nothing guarantees success, however if you have motivated individuals, strong leadership, and practice methods for efficient and effective facilitation of collaboration, teams will be more likely to succeed. Many complications can occur within an organization or the market place that could derail an initiative. However, if

the individuals, leaders, and practices are strong the team should be able to adapt to organization changes or changes in the market.

Relating themes and literature to the core values of Agile

The themes of this study and the literature reviewed in this study provide support for the core values of Agile. Below is a discussion of some examples how the themes and literature reviewed support the core values.

Individuals and interactions over processes and tools

Project success ultimately depends on the individuals who are brought together to solve a problem. Individuals need to determine the working agreements of how they will work together. Individuals need to decide on the shared vision as identified in the themes. Individuals need to be responsible and contribute to the group effort. Individuals need to identify opportunities to lead and provide leadership when appropriate. Individuals need to identify the process and tools that they will be using. All of these points were identified in the themes of this study and support the importance of valuing individuals and their interactions over the processes and tools utilized by a team.

Highsmith states that processes provide guidance and support, and tools improve efficiency but without the right people who have the right technical skills, all the processes and tools in the world won't produce results. Processes (in moderation) and tools are useful, but when critical decisions must be made we rely on the knowledge

and capabilities of individuals and the team. Good processes should support the team, rather than dictate its action (Highsmith 2004).

All of the case studies reviewed exhibit individuals and their interactions as more important than the process and tools utilized by the teams. Tenenberg presents several working teams that established working agreements that were appropriate for each team, rather than all teams working from a predefined set of rules. Sharp and Robinson present teams that were working with Story cards and a project wall to facilitate various meetings that are a part of the Agile process. While the story cards, wall, and meetings were important, the most important thing was that the individuals of the team were coming together to communicate and interact with one another. Cherry and Robillard presented ad hoc communication that occurred within a team and that these informal interactions between individuals of a team were an important element of the team's success. These studies display that success of various processes and tools are is dependent on how well individuals utilize the process and tools to interact with one another.

Working products over comprehensive documentation

It is more important to put emphasis on working to realize the product that the team is tasked with developing, than working to create comprehensive documentation that describes the product being developed. At the conclusion of a project, a team is evaluated on the resulting product that they provide rather than the extent to which they recorded their progress or descriptions of the solution that the team delivered. As

the Agile Alliance stated, this core value does not imply that documentation is not important or should not exist. The story cards and wall presented by Sharp and Robinson presented a good example of lightweight documentation that was easy to access and update. The documentation serves to guide or facilitate the team towards desired outcomes.

Both documentation and working products fit with the theme of facilitating a team towards a solution. Consistent with the core values of Agile, working products, or models of the product, are more valuable aids to move the team towards a solution than documentation. Highsmith provides a good explanation of why working products are better facilitation aids than documentation. Highsmith describes prototypes, or working models of the product, as "shared spaces". Shared spaces provide an artifact that all team members consider common ground, or a shared space, for discussion. All team members are able to relate to and give feedback on prototypes that team members create. Not all team members are able to understand the documentation created by the different disciplines on the team. Technical team members may not be able to visualize a product representative's requests for software features. Similarly, a product person may not understand how a technical architecture specification translates to a valuable product.

In addition to using the prototypes as means for communication, efforts spent improving the interface and interactions of the prototypes are focused on improvements that can be implemented into the product. Focusing on documentation

causes the team to spend significant time and effort describing what a system should do, rather than the team spending time and effort improving the working system.

Customer collaboration over contract negotiations

Customers are the people who use the product. When customers, or users, can not be made available to constantly participate in the creation of a software solution, representatives of the user need to collaborate closely with the development team that is coding the system. User representatives are able to provide guidance of how the system should work. User representatives present the priorities of the user when developers need to determine what to work on next. Traditionally, this is the role of product management. Relatively new roles, such as User Centered Designers, are also becoming more common on development teams. Ultimately the representative of the user keeps the team aware of the users' needs and can guide the team towards solutions that provide value.

User or customer representatives need to collaborate closely with developers as the product is being created, rather than interacting through contract negotiations. Working only through contract negotiations takes much longer to resolve issues and there is no guarantee that the contract negotiations will resolve the issue. Similar to how Cherry and Robillard presented benefits of ad hoc communication for developers communicating on a team, customer representatives and developers need to work close together and be allowed to quickly ask and answer questions. Relying on contract negotiations to resolve issue can take too long and may not allow the

respective parties to truly develop an appreciation for one another's perspective. Working closely together and communicating in an ad hoc fashion allows for team members to respond to one another's questions, as well as understand each other's concerns better than when team members only come together for formal discussions at scheduled points in the process.

Leadership is an important theme in working towards this value. Customer representatives will need to recognize when to lead or give guidance to the developers of the team on what is best for the customer. User representatives will also need to work with the developers to identify alternative solutions that fulfill the shared vision for the product if initial solutions can not be realized due to technical constraints or limitations. It is important for individuals to collaborate with each other to create the best solution for the intended user while working within the capabilities and limitations of development to realize the shared vision.

Responding to change over following a plan.

All projects have unforeseen obstacles that will occur as teams work towards a software solution. Project teams need to be able to respond to the obstacles presented and change course when necessary. Establishing an initial plan to work from is helpful to get started, but sticking to a plan when it is failing to create results is not a successful way of working. Teams need to be able to adjust both to the functionality agreed to in realizing the shared vision, as well as to how the team works to create the solution.

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Working from a shared vision is an important theme when working from this core value. Establishing a shared vision of what to accomplish does not mean that stating exactly how something will work. A shared vision describes what a solution will do for an end user. Teams may need to adjust how exactly the team realizes the shared vision. Highsmith states that an Agile framework allows teams to envision what they will make and how they will work. Once teams have established the initial agreement of how to proceed, they then need to do some of the work and review the progress. Working iterative an incrementally allows teams to complete some of the work, evaluate the progress, and determine how to proceed.

Teams may also need to change how they work together to create a solution. The teams in Tenenberg's study were self organizing teams that established working agreements that guided how the teams worked together. The working agreements of the teams replaced a pre-existing set of rules that teams were required to follow. Tenenberg does not state that teams did adjusted their working agreements while collaborating, but self-organizing teams must be able to be flexible and change working agreements when valid reasons are presented for adjusting or adding to working agreements.

Implications for future projects
As team collaborate in future projects, regardless of the process or framework, team members should keep the core values of Agile in mind as well as the themes developed from this study. Placing importance on the individuals that are on a project

and allowing them to interact as needed will go a long ways to helping teams resolve issues and successful develop software solutions. Individuals that understand user needs should be working closely with developers as the team makes progress towards realizing the shared vision of the team. All team members should focus their efforts on working products or prototypes of the working product, rather than relying on descriptive documentation to communicate what the product should do or how it should work. Teams need to recognize that even the best plans created in the beginning may fail to account for issues that can arise during the course of the project. Teams should be prepared to change course as necessary. Strong leadership and proven practices for facilitation will help the team to identify when changes need to occur and how best to respond.

Future research

Just as Agile was derived from earlier iterative and incremental methodologies and as a reaction to prescriptive, linear methodologies, new methodologies will surely arise from the variations of Agile. As new methodologies develop for software teams to work from, research should be conducted to see if the core values of Agile or the themes from this study still apply.

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Appendix A: Questions asked in participant interviews

1. What does it mean to successfully collaborate?

2. What does it take to achieve successful collaboration?

3. What are the necessary activities that need to take place to ensure successful collaboration?

4. What does it mean to have an unsuccessful collaboration?

5. What actions, or inactions, lead to unsuccessful collaborations?

6. How does Agile shape successful collaboration?

7. What, if removed from the Agile process, degrades collaboration?

Appendix B: Overview and detail of responses organized per question

Figure 1. Figure 1. Responses from each question were organized into meaningful groups

Figure 2. A photo of a group of responses.

Appendix C: Groups of meaningful statements per question

1. What does it mean to successfully collaborate?
   - Come together as a team
   - Achieve goals identified by team and individuals
   - Perform effective and efficient communication
   - Develop and strengthen interpersonal cooperation in process

2. What does it take to achieve successful collaboration?
   - Motivated individuals prepared to cooperate
   - Individuals who understand responsibilities
   - Individuals who participate in activities to coordinate team members
   - Strong leadership
   - The members of the team need to be set up to succeed
   - Individuals who are able to put goals of the team before personal goals
   - Team acknowledgement over individuals

3. What are the necessary activities that need to take place to ensure successful collaboration?
   - There are no activities that guarantee of success
   - Some activities need to go right that are outside of the groups domain or beyond the control of the team
   - Activities that bring individuals together as a team
   - Communication activities that address specific topics in an adequately frequent, efficient, effective manner
   - Activities that lead to the correct of set up team member's skills, environment and tools
   - Responses relating to what the activities should focus on
   - Responses relating to individual team member responsibilities in activities
   - Responses relating the strong leadership and facilitation

4. What does it mean to have an unsuccessful collaboration?
   - Problems launching, implementing, integrating identified solutions
   - Not establishing an momentum towards progress
   - Failing to come together as team
   - Experience\not benefiting individuals or living up to individuals definition of success
   - Not achieving goals of team
   - Individuals mis-use of power

5. What actions, or inactions, lead to unsuccessful collaboration?
   - List is arbitrary, just about anything can cause collaboration to fail

- Actions and inactions that limit members ability to come together as a team
- Responses describing actions or inactions of poor management of project'
- Actions or inactions that provide Insufficient communication
- Responses describing Inappropriate interpersonal actions and inactions
- Inappropriate actions or inactions preformed by individuals
- Actions or inactions failing to achieve a common understanding towards shared vision
- Actions/inactions that do not demonstrate that the team is appreciated appropriately by outside stakeholders

6. How does Agile shape collaboration?
    - Agile gets people working together effectively
    - Agile promotes communication
    - Agile gets members to agree and share understanding of work to be done
    - Agile focuses on value and results
    - Agile promotes accessibility to artifacts that help team get work completed
    - Agile improves outcomes of individuals, better than they might on their own
    - Agile allows for learning and improvement
    - The core values of Agile are focused on collaboration

    However,
    - Agiles values do not address all things necessary for success, so may harm collaboration
    - Agile focuses on change and can wear down participants, not focused on stability
    - Agile does not explicitly focus on architecture or software long term
    - Agile does not explicitly focus on user or UI

7. What if removed, from Agile degrades collaboration?
    o Removing any core values
    o Agile utilizes organizational patterns, many configurations of patterns possible, but can not remove any of the patterns
    o Losing customer focus
    o Continual communication across all perspectives
    o Removing accessible tools
    o Scrum master
    o Individauls buy in to team
    o Individuals motivated to collaborate
    o Individuals feeling, understanding, and identifying with team
    o Stakeholder buy-in

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- o Ability to inspect and adapt
- However,
  - o Can get by without doing all things in Agile, can succeed in many other ways of working
  - o Some things could be added to improve agile to improve collaboration
  - o Some things in Agile degrade collaboration and would be good to remove from Agile
  - o Some things added to Agile is what can degrade collaboration
  - o Agile is a structure and values could be interpreted in many ways to influence how they are practiced

Appendix D: Meaningful groups organized into themes across questions

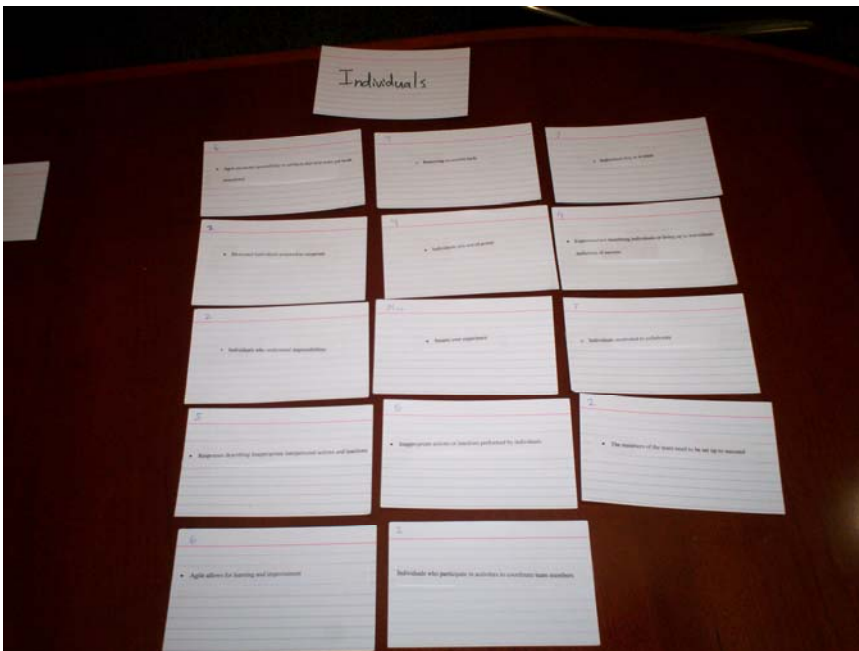**Figure 3. Titles of meaningful groups organized into themes.**

Figure 4. A photo of the meaningful group titles that made up the theme of individuals.

Appendix E: Bios for Study Participants

Note: only six participants completed the bio questionnaire.

Participant Initials	Participant Bio
JH	40+ years in software development & PM. About 25 of those years as a consultant & trainer.
VD	CST and M.Tech [equivalent to MS] in Manufacturing Systems Engineering. I work as a Project Manager, Pre-sales and Product Consulting Group and also as a Scrum Coach for my organization. I help integrate departments like Finance, HR, Pre-sales, Analysts in Agile and also coach teams already doing Agile Projects in improving and root cause analysis.
KC	MS and PhD in Computer science with emphasis in software engineering, database theory, and artificial intelligence. I've worked in industry as a software engineer; worked as an associate professor of computer science at Northern Arizona University; and most recently as a consultant doing Agile project management and development training, coaching, mentoring, and technical leadership.
JL	I have been designing and developing web sites and web applications for about 8 years. Most of my experience has been with information architecture and user-centered design, though for the past two years I have been working in product management.
LH	CEO and Founder of Enthiosys, Inc. An internationally-recognized software product expert, LH leverages over twenty years of experience in leading all aspects of successful software product development groups, including engineering and development, product management, professional services, business development, sales support, and customer care. Key industries include transportation and logistics, intellectual property, financial services, software security/anti-piracy, and software process. The author of 3 books on software development, as well as numerous articles on product management, product development, and software development, LH is a regularly invited speaker/panelist at major industry conferences on topics ranging from software development processes to strategic product management. He is also a former faculty member of the University of California, Santa Cruz, Extension and University of California, Berkeley, Extension. LH is an inventor or co-inventor of more than ten pending or issued patents, and is uniquely capable of bridging the gap between business and technology. He is skilled at multi-platform, multi-disciplinary, multi-team iterative/incremental enterprise-class

	systems development practices that produce reliable customer deliverables. He is a "hands-on leader" who works with the team to create breakthrough product architectures. LH 's proficiency at recognizing revenue and cost drivers lead to significant top-line revenue growth and bottom-line profits. His creativity in structuring mutually-beneficial business relationships produces lasting results. LH serves on the technical advisory board for Rally Software Development Corporation. Prior to founding Enthiosys, LH was VP of U.S. Business Development for Aladdin Knowledge Systems (NASDAQ: ALDN, formerly Preview Systems); the VP of Engineering and Product Development at Aurigin Systems, Inc.; Education Technical Director at ObjectSpace, Inc.; and VP of Systems Engineering for EDS Fleet Services. He is a member of the ACM, IEEE, and PDMA.
JC	I was one of the people who laid the groundwork for popular object-oriented design in the 1980s, and am a founder of the Pattern discipline. I am the founder of Organizational Patterns which Jeff Sutherland credits as the source of Scrum meetings, and which Kent Beck credits as being one of the two sources of XP. I have a BS in Electrical and Computer Engineering, a Masters in Computer Science, and a Doctorat i Wetenschappen.