Creative Collaboration for the Agile Process

J. A. Hall[1] and B. L. Weiss[2]

[1]The MITRE Corporation, Decision Visualization Support Department, 7515
Colshire Drive, McLean, VA 22102; jhall@mitre.org
[2]The MITRE Corporation, Collaboration and Social Computing Department, 7515
Colshire Drive, McLean, VA 22102; bweiss@mitre.org

ABSTRACT

The Agile Capability Mashup Environment (ACME) methodology is an
innovative tool developed to encourage team engagement and consensus
building. ACME is based on design thinking and utilizes horizontal
collaboration to create an environment where diverse stakeholders, many with
deep technical expertise, can engage on a level playing field. ACME
combines simple low cost tools (e.g., whiteboards, cut outs, toy figurines,
webcams, etc.) that assist teams to develop and communicate their ideas in
multi-dimensional ways. This creates a collaborative space where teams can
freely explore and critique ideas, with the goal of turning individual
knowledge into a useful project team outcome.

In the Agile development process, teams work to create software and products
rapidly and efficiently across different domains. In order for Agile to be
executed successfully, individuals and teams with various skills sets (e.g.,
project management, research, design, engineering, etc.) need to communicate
ideas, plan schedules, and collaborate solutions to potential problems. The
criticality of communication and coordination in the Agile process
necessitates the need for a tool that can appropriately facilitate these activities.
When the ACME methodology is applied to Agile development, it encourages
and facilitates innovative thinking and collaboration in the early stages of the
engineering process as well as throughout product development. This process
allows Agile teams to efficiently collaborate within and across areas of
expertise to develop innovative products that provide valuable solutions to
customers and stakeholders.

WHAT IS ACME?

The Agile Capability Mashup Environment (ACME) methodology is an incubator that drives innovative thinking through team engagement and consensus building. The ACME framework (Figure 1) combines team challenges and expertise with ACME assets and facilitation to arrive at solutions. Challenges and problems that teams need to address can vary widely from brainstorming the future vision for a project to defining requirements for products. Teams that are tasked with addressing these challenges are typically made up of individuals with diverse backgrounds and varying technical expertise. To foster innovative thinking, ACME provides an environment where these diverse teams are encouraged to engage on a level playing field, taking advantage of the deep technical expertise and the diversity of thought in a democratic way. Leveraging the diverse skillsets of all team members will encourage different approaches to solving the problem, which ultimately leads to more innovative solutions.
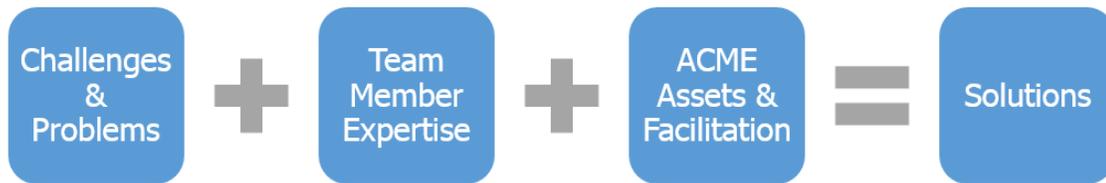
Challenges & Problems **+** Team Member Expertise **+** ACME Assets & Facilitation **=** Solutions

Figure 1. ACME Framework.

ACME utilizes various assets and facilitation methods to encourage collaboration and problem solving within teams. These methods are non-linear, allowing trams to continually examine the problem and the given context in order to reach the best possible outcomes. One unique asset used for sharing ideas is the Collaborative Story Development Kit (CSDK). This kit helps team members communicate complex ideas via a webcam positioned over a whiteboard. Team members are encouraged to work around the whiteboard, expressing their ideas using markers, sticky notes, and physical objects (e.g., blocks, toy figurines, etc.). The activities occurring on the whiteboard can be projected in the room so all participants can see the process as it unfolds. The CSDK is an effective tool because it provides the ability to capture the whiteboard throughout the collaborative process. The iterative process that leads to the final product is often as valuable as the end result itself.

ACME IN AGILE

The Agile development process brings teams composed of individuals with various skills sets (e.g., project management, research, design, engineering, etc.) together to rapidly and efficiently create software and products. Collaboration has

been identified as a key factor to success in the Agile development process (Fowler & Highsmith, 2001; Misra, Kumar, & Kumar, 2009). Research by Hoda, Noble, and Marshall (2011) found that inadequate collaboration in Agile teams can lead to severe consequences including unclear requirements, lack of feedback, and loss of productivity. Agile teams need to communicate and coordinate frequently to be successful, thus, creating the need for a tool that can appropriately facilitate these activities. The ACME framework can be leveraged both early and throughout the stages of the Agile model (Figure 2). While the ACME process can be applied at any point in the Agile lifecycle, it has been found to be most useful in the brainstorming and design phases. The activities in these phases include requirements shaping and prototyping, respectively. ACME can also be leveraged at any other stage in the process where team collaboration is necessary in order to arrive at the best possible solution.
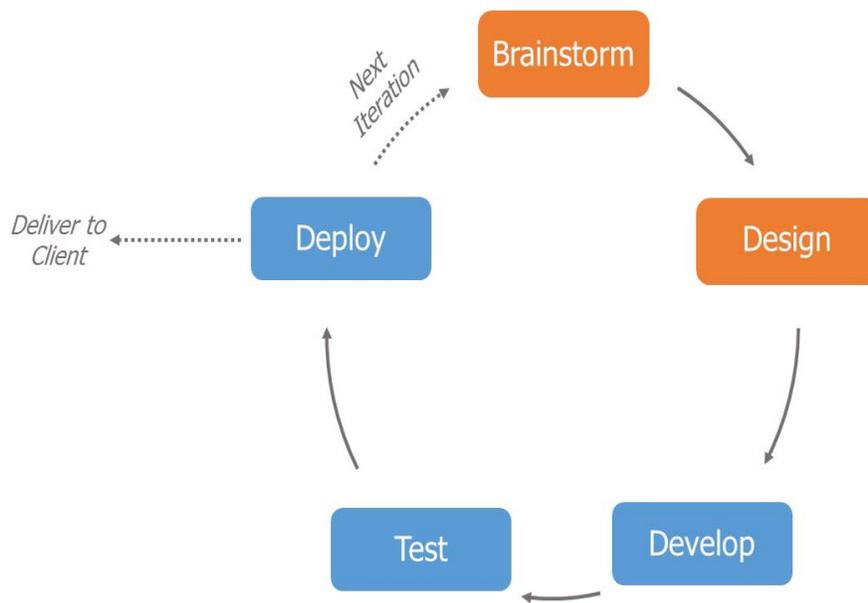

Figure 2. ACME in Agile.

The brainstorming phase is a critical stage where stakeholders need to come together to identify and agree on the requirements for the product. Stakeholders can come from many different technical backgrounds, which can all be leveraged to address requirements from multiple perspectives. The ACME methodology encourages all of the stakeholders to have a voice in the requirement generation process, by putting everyone on a level playing field and encouraging all team members to participate. This collaboration leads to better requirements because all viewpoints are considered, which results in a more robust end product.

During the design phase, the team will work with the stakeholders to define workflows, create initial designs, and test design concepts. ACME allows designers and stakeholders to work together to rapidly ideate designs on the whiteboards. Team members are encouraged to all work around the board, resulting in designs that meet stakeholder needs and work within technical constraints. With all team members involved in the process, everyone is empowered to make decisions. This allows teams to buy into the design concepts early so development can quickly move forward without the back and forth of a traditional process.

ACME is also useful for providing solutions to problems that occur throughout the Agile process. For example, sometimes blockers are identified during daily scrums that require collaboration with the stakeholders. With ACME, blockers can be resolved quickly through a brainstorming session using the ACME CSDK and facilitation methods, as needed. Overall, ACME can facilitate and enhance the Agile process by encouraging efficient collaboration across areas of expertise during all stages of Agile, but is especially useful in the early stages. See Figure 3 for examples of ACME in action in Agile projects.

Figure 3. Examples of ACME use in brainstorming, design, and problem solving with Agile teams.

WHY

IT WORKS

ACME is a very simple concept, but yet it is so effective for Agile teams. There are several factors that contribute to ACME's effectiveness including the breaking of norms, the horizontal nature of the collaborative space, and the ability to accommodate rapid decision making and consensus building.

Breaking Norms. In a typical meeting room, people encounter numerous distractions that can cause them to lose focus on their work. For example, during a team meeting people can often be checking email on their mobile device or putting the finishing touches on an important deliverable. Conducting ACME sessions requires team members to break these typical meeting norms, detach from their daily routine and take a deep dive into brainstorming and problem solving with a specific outcome in mind. Team members are encouraged to put away their technology during the discussion so they can give their full attention to the problem.

Horizontal Collaboration. ACME promotes collaboration by placing the whiteboard horizontally on a table and having team members gather around it to work. Traditionally, whiteboards are hung vertically on a wall, making it awkward for multiple people to work on the board. When a whiteboard is hung vertically it is typical for one person to take control of the marker and essentially control what is written on the board. When two team members take to the whiteboard it can quickly become a two-person conversation with the remainder of the team reduced to bystanders. Because other team members are not empowered to write on the board, their ideas may not be captured and considered. When the whiteboard is positioned on the table, it levels the playing field allowing everyone to participate on equal footing, resulting in everyone contributing their ideas during the discussion.

Rapid Decision Making and Consensus Building. The ACME assets support rapid decision making. A positive outcome of the democratic process created by horizontal collaboration is the ability to achieve shared understanding, agreement and consensus. Once a problem is identified, teams can quickly to work together to come to a shared understanding of the problem and work toward the best solution. The ability for teams to make decisions quickly and efficiently compliments the iterative nature of Agile.

These factors combine to create the ACME process which facilitates collaboration between team members. The result is team decisions that promote mutual understanding and solution buy in. ACME is a valuable tool in any setting requiring collaboration, including Agile.

OTHER APPLICATIONS

The ACME process is used at MITRE for agile projects but has also been valuable in other areas. ACME has been utilized for organizational change management framework development. During these sessions, project teams come

together to create plans for their path forward. Another area where ACME has been used is in the facilitation of tabletop war gaming scenarios. During these sessions, teams work on the board to carry out war game plans and scenarios. When the exercise is complete, teams can review the documented pictures from the session to refine their approach.

CONCLUSIONS

The ACME methodology provides a valuable tool that Agile projects can leverage to promote collaboration in Agile teams. ACME combines team challenges, team member expertise, and ACME assets in order to deliver desired outcomes and solutions. ACME is especially valuable in the early brainstorming and design phases of the Agile process because it promotes collaboration and empowers team members with deep domain knowledge to share their ideas with the group. ACME can also be useful for problem solving throughout an Agile project. ACME works because it removes distractions, promotes horizontal collaboration, and it accommodates rapid decision making. Project managers need to promote a highlighly collaborative environment for success on any Agile project (Coram & Bohner, 2005). ACME has been a successful collaboration solution for MITRE project teams and their sponsors. This simple methodology can be leveraged by any project team, all that is needed is a whiteboard on a table and the desire to collaborate.

REFERENCES

Coram, M., & Bohner, S. (2005). "The impact of agile methods on software project management." In *Engineering of Computer-Based Systems, 2005. 12th IEEE International Conference and Workshops*, 363-370.

Fowler, M., & Highsmith, J. (2001). "The agile manifesto." *Software Development*, 9(8), 28-35.

Hoda, R., Noble, J., & Marshall, S. (2011). "The impact of inadequate customer collaboration on self-organizing Agile teams." *Information and Software Technology*, *53*(5), 521-534.

Misra, S. C., Kumar, V., & Kumar, U. (2009). "Identifying some important success factors in adopting agile software development practices." *Journal of Systems and Software*, 82(11), 1869-1890.