

Chapter 2

The Psychology of Change

If you do not change your direction, you may end up where you are going.

Lao Tzu

2.1 Why Do We Resist Change?

If change has always been an integral part of life, why do we resist it so? Why, in every generation, do we have Luddites? What goes through a person's mind when they are informed of or predict change? Is my position safe? What will I have to do? What will I need to know? Am I capable and confident with new direction? Do I have any say about this or any control over what is about to happen? Do I really need to change? Do I have time for this? How am I going to do that and this? How will this impact what I have already done? As you can see there are many questions that come up when even the thought of change occurs. It seems obvious that there should be thought put into change theories as we ask for people and environments to change.

Some key components to encourage change are empowerment and communication. People need time to think about expected change. As we discussed earlier, people are good at change in order to master or improve their world or environment. When people remain agile they are better at being agile. When change is part of the regular process then one becomes agile. Alternatively, when one is used to doing something exactly the same way or systematically then it becomes the way one likes to operate.

Why, in particular, do some engineers not like change? When asking this question it seems obvious to consider education. What is it that has been required of engineers in the past and present and what will be required of them in the future. Lucena [40] hypothesizes connecting engineers' educational experiences with their response to organizational change and offers a curriculum proposal to help engineers prepare for changing work organizations. As our technology increases and our work world becomes more agile it makes sense also that soft skills will become more and more important for engineers. Engineers can organize themselves to optimize performance with soft skills.

Trust is the most important factor in change. Trust helps to balance fear which is often the root of most resistance. Who in their right mind will blindly make changes without trusting others? Agile methods increase trust by increasing transparency, accountability, communication, and knowledge sharing [41]. Iteration/sprint planning

methods give members visibility on requirements, individual assignment, and agreed estimates. People get the information at the same time. The daily stand up provides visibility and transparency so issues can be addressed immediately. People will know if someone is behind. The sprint/iteration retrospective provides transparency and visibility regarding goals. This agile design builds trust among the team members as they are able to see others' trustworthiness and competencies as they continue working together.

Crawford et al. [14] suggest that employees who had higher creativity, worked on complex challenging jobs, were supportive, had supportive non-controlling leadership, and produced more creative work. If workers see that their ideas are encouraged and accepted they are more likely to be creative. Empowerment and trust encourage creativity which encourages change which encourages agility [41].

Think about the complexities that people bring to projects. Think about projects of many teams made up of many people, virtual teams, many sites, many locations, many levels of expertise and experience, many cultures and places that people live. Then add in technology, many technologies, changing technologies, developing, and revolutionary technologies. It becomes more and more clear that soft skills are incredibly valuable to engineers and particularly to agile teams. Azim et al. [2] show that up to 75 % of project complexity has to do with the human factor or the people in the project. They claim that soft skills are important in the implementation of plans. Soft skills are clearly important in any complex project and in all phases of change previously discussed, particularly in the commitment and transition of change.

Soft skills include organizational, teamwork, communication, and other people-based skills. As technology matures and new technologies emerge it is imperative that the teams and people in the teams become more agile. Not only is technology constantly changing, so are people. It seems ever so important that the soft skills come with the hard skills.

One of the main thrusts of this book is to introduce the reader to a new organizational structure, called the Theory Z organization ([Chap. 5](#)) in order to facilitate a system engineering design methodology that embraces and handles change as an integral part of the normal process flow. We will refer to the following discussion throughout the book, in reference to Theory Z management and organizational structures. We will briefly introduce Theory Z here with much more detail to come later.

Theory Z: Described as “consensus decision making,” establishes strong bonds of responsibilities between team leads and team members, with a high importance placed on finding people with the right skills, both “hard” skills (e.g., technical) and “soft” skills (e.g., creative thinking) for team creation. This creates a seven-point structure for Theory Z teams:

1. Strategic plan of action.
2. Strategic team organization.
3. Systems/software/test/hardware formal and informal procedures that support the strategy and structure.
4. Team goals—guiding concepts.

5. Staff—people/human resources.
6. Skills—the right skills, not generic engineers.
7. Style—soft skills that facilitate cooperation and collaboration within the team: the cultural style of the organization.

2.2 How Do We Embrace Change?

There are many psychological considerations to think about in relation to Theory Z structures. First, let us consider humans and their social interests, tagged by Alfred Adler as *Gemeinschaftsgefühl* [8], which described people's state of social connectedness as part of their overall psychological health. Let us assume that all healthy humans have these innate social interests in any given environment. Thus, people can create group goals and together work toward a common goal or product as a group. One could interpret Adler's theory as saying people have the will to change for the better, the will toward mastery of problems, or the will toward perfection. People desire to change, to grow, to overcome, to master. They have the creative power to redirect efforts. This is very different from a will to power, different from directing the group to bettering the group. In a group of healthy people, the group as a whole is likely more satisfied with working toward a common goal of the group than working toward being the power of the group. Given the Type Z structure, people have the potential to be more successful than the top-down management styles. People can work together to address changes and solve problems better than being told what to do and stick to specific tasks. People are adaptable, not static, but ever changing.

Of course, context is always important to consider. There are some contexts that will require different roles to be implemented. There is a time for some direction to the group and there is a time to get direction from the group. Specifically, each member plays an important role while at the same time so does the group as a whole. Thus, there is a time for facilitation within the group and a time for facilitating between groups. As stated previously, this is the structural difference with Theory Z.

It is important when facilitating groups of people to consider group dynamics. There are different theories about groups that have been well documented. According to Jacobs et al. [34] all groups go through three stages: the beginning, the middle or working stage, and the end stage. Briefly stated, the beginning stage is about getting to know and be comfortable with one another. It is a time to define goals or problems that are going to be addressed. The middle stage is the working stage where things happen and the group can see itself as a whole or mostly whole.

At this point the group is productively working to accomplish its goals. The end stage is the termination point where people can consider their accomplishments and what they were able to get from being in the group. Most engineering organizations subvert this process by creating Integrated Product Teams at random, filled with a mix of generic skills (H/W, S/W, systems, test, etc.) and assume, by sheer force of management's will, they can be made to be a productive team.

Tuckman [51] talked about developmental stages of groups depending on their group activities. Relevant to our discussion in this book is his work in describing task-oriented interpersonal groups as going through stages such as testing-dependence, conflict-resolution, cohesion, and functional role determination. In particular, Tuckman concentrated on the task-oriented group and their development phases: orientation, emotionality, relevant opinion exchange, and emergence of solutions. Tuckman addressed the separation of interpersonal groups from task groups in that each person brings their self into the task group as well as the social group (note, a development team is a form of social group). People may not be sharing about personal issues in a task group but their *personhood* will show up. Nonetheless, people are going to follow the dynamics that it takes to get to the working stages of the group. They will have to figure out what role they play, what are the norms of the group, how safe it is to provide their input, do they trust others, how will the facilitator respond, etc. Groups go through these phases, termed forming, storming, norming, and performing. The facilitator's role is to get the group to the performing stage. The quality function deployment's (QFD) role would optimize productivity while paying attention to group dynamics. We will discuss the QFD in detail later in this book.

In "Forming to Performing: The Evolution of an Agile Team", the authors suggest that the stages of groups are cyclical in nature [45]. Tasks that are and are not accomplished in one phase may be revisited in others. Yet, they say, what will remain constant are the agile principles. Thus, supporting the role of the QFD to facilitate and promote necessary changes within the group to reach the optimal performance of the group. Relating back to Tuckman [51], these authors talk about different tasks they identified throughout their group processes. In the beginning they talk about testing tolerance, working style, providing direction, and unclear processes. They relate that during the storming phase the group was characterized by polarization, personal agendas, direct guidance, attrition, and factions. The norming phase consisted of cohesion returning and fostering collaboration. In the performing stage they were able to identify total focus, collective decision making, collaboration, and productivity.

To consider Theory Z is to consider change and to consider people's response to change. We can see thus far that people like change as it comes to mastering or bettering themselves and thus their product. So why is it that many people seem to resist change? Let us consider some reasons why we might see this. First and foremost is fear. People do not like change if they fear losing something they value. Secondly, people prefer that their world and environments are predictable, so that they can know what to expect. It makes sense that people are on edge in unpredictable environments because they are spending more time in trying to figure out what is going to take place. This is where Theory Z may be helpful in that when people are part of the decision process they are more likely to see it as predictable or at minimum spend less time worrying about what is next. They will also be able to find comfort with the group being involved in decisions because

there is less guess about where management came up with the decision to operate in that way to get some end result. People experience change often. The facilitator or QFD can promote healthy change that keeps stress to a minimum.

2.3 Components of Change

In “A Meta Model of Change” [55] the author writes about a Meta-Analysis of many change theories. He found nine common themes that are appropriate for our discussion. He writes that change starts with an *existing paradigm* and the nature of this paradigm will determine if there will be recognition that change is needed. Next, there is a *stimulus* and then *consideration*. The stimulus is the motivator and the consideration is limited by the observer. He also observes that there is a need for different viewpoints. The next stage involves what he describes as *validating the need*. This stage answers the question: is there enough evidence that change should occur? Once it is determined that change should occur then one must *prepare*, plan, or reengineer. The following step is a *commitment to act* followed by what he calls *transition*; the *do-check-act*. Here we ask: is the vision or reengineering meeting the goals and do adjustments need to be made? The next phase defines the *specific results* of the efforts to change. The final phase is *enduring the benefits*. The change has also produced the ability to change and all that comes with the finished product.

2.4 The Encouragers of Change

Some of the strongest encouragers of change are trust and empowerment. Empowerment allows people to develop and make decisions with confidence. Trust is very similar. Trust and empowerment go hand in hand. These give way for humans to make change that results in more change.

In a general sense, empowerment can be thought of as a motivator. It is about living up to one's potential. It includes making choices and taking actions. Wan and Zhou [53] suggest that when an individual feels “authorized” they may change attitude and behavior. Empowerment gives people a sense of authorization. How differently does one act when they feel authorized versus told what to do and to get something done? Honald [31] writes that each organization must define exactly what it is that they mean by empowerment and that empowerment must address the needs and culture of each unique entity. How does each entity give authority to or afford people to meet their potential? If we want people comfortable with change then we need to empower them to have authority to make decisions and have choices upon what actions to take.

How many more choices will an individual see when they feel empowered versus ordered. Those are extremes but it helps bring the point home. Empowerment gives people a sense of ownership and an opportunity for creativity. People can come up with new ideas and solutions to problems and are more likely to be motivated to work toward those solutions when they have some personal investment in them.

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