



PACIFIC NW
28TH ANNUAL
SOFTWARE
QUALITY
CONFERENCE

OCTOBER 18TH – 19TH, 2010



ACHIEVING
QUALITY
IN A COMPLEX
ENVIRONMENT

*Conference Paper Excerpt
from the*
CONFERENCE
PROCEEDINGS

Permission to copy, without fee, all or part of this material, except copyrighted material as noted, is granted provided that the copies are not made or distributed for commercial use.

Managing Polarities in Pursuit of Quality

Denise Holmes

Principal, Edge-Leadership Consulting, LLC
503.719.7462 | denise@edge-leadership.com

Abstract

One of the questions for this conference is “can complexity be managed or are we destined for complete chaos?” The key concept in that phrase is that of *managing complexity*, versus being at the whims of a complex system. Sometimes a sense of powerlessness results from treating interdependent factors as independent of one another and then being surprised at the negative impacts that occur because we weren’t aware of their interrelatedness. For example, taking the stance “we need to focus on quality no matter what it costs or how long it takes” could result in a wildly over-budget project that is obsolete or of no interest to the customer by the time it is released. This is more likely in a situation in which costs and time to market aren’t proactively managed at some level. The opposite also holds true, going for speed at the expense of quality, or cost at the expense of quality might mean losing customers’ trust and business, beginning a downward slide that finishes the organization. The reality is that all of these factors are important and influence each other to some degree: quality AND cost AND time to develop. These are just a few dynamics that may be competing with each other in our world.

So, what does this mean for the quality professional of today?

Managing complexity means recognizing differing and critical needs, how to experience the upsides of each need, avoid the downsides, and do it all intentionally, with awareness of the choices being made. The skills to accomplish this, as covered in the paper, include the ability to:

- Recognize system dynamics at play, called polarities, that may be getting in the way of your quality goals;
- Manage these polarities through a deceptively simple process; and
- Apply this process as a communication and conflict resolution tool to create dialogue about what is important and why.

This paper introduces the process of polarity management as a way of seeing, thinking and communicating around opposing dynamics to help you become (or remain) a proactive player in support of your software quality efforts.

Biography

Denise Holmes, Principal of Edge-Leadership Consulting in Portland has a background in designing and delivering experiential leadership development, coaching individuals and teams through change and applying system dynamics to her consulting. Denise built her expert facilitation and coaching skills in the worlds of health care and high tech. Denise holds an M.A. in applied behavioral science from the Leadership Institute of Seattle. She also holds an M.B.A. from Marylhurst University and a B.A. in international studies from the University of Oregon.

1. Introduction

There is no doubt that the world of software engineering is complex in both technical and managerial ways. When overwhelmed by the complexity of a situation we may respond in several ways: freeze and become unable to function; fight and argue with others; or go along to get along while simultaneously believing that whatever we try will never be good enough.

This paper introduces the process of polarity management: a way of seeing, thinking and communicating opposing dynamics so that you can feel more in control within complex systems, increase the choices available to you and those you work with, and find common ground on which to work through conflicts with other stakeholders. Specifically, this paper mixes theory and practical examples to:

- 1) Define polarities and share examples that apply to software quality;
- 2) Share the dynamic pattern of polarities: upsides, downsides, and what happens when there's a badly managed polarity;
- 3) Outline the steps for managing a polarity well over time; and
- 4) Apply the polarity management process as a communication and conflict resolution tool.

2. What are Polarities?

Polarities are sets of opposing or seemingly contradictory alternatives which over time, can't function well independently. This means that to some degree, the polarities represent constant tensions to manage, not problems with a clear solution or decision point. This definition will become clearer through examples in this paper. The image below represents two opposing poles.

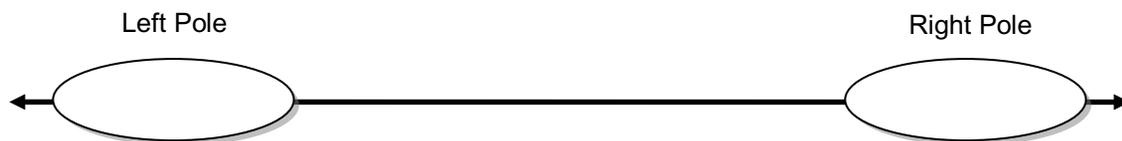


Figure 1: A visual representation of two polarities and the implied tension between them

When a polarity is present, both points of view are accurate, but neither is complete on its own. For success, the polarities are recognized as a “both/and” scenario rather than an “either/or” choice. This is because a focus on one point of view at the expense of the other will result in negative impacts, as will be discussed further below. In the study of polarity management, polarities are also often referred to as opposing dynamics, paradoxes, dilemmas, or competing points of view.

Examples of polarities in the software quality field include:

- *Uniformity and customization*: For your software, what is the right mix of uniformity and customization that is manageable and cost-effective?
- *Stability and change*: How do you balance identifying release criteria with follow-on releases and new features?
- *Advocacy and inquiry*: How might you balance proactively sharing and advising best practices for your product while soliciting and integrating customer feedback?
- *Details and big picture*: What do the coders and testers need to know about the customer's business requirements, both current and future?
- *Task and relationship*: How do team members learn enough about each other to work well together and focus on the work to be accomplished? How do you build trusting relationships with the client so that it supports getting the work done as needed, when needed?

- *Structure and flexibility*: In choosing a software development methodology, how do project teams manage what stays firm and fixed in the processes, and what is malleable, open to emergent factors, and flexible?¹

A longer list of polarities is listed in the Appendix, though there are infinite combinations of potential polarities.

2.1 Differentiating Between Problems and Polarities

Polarities, or dynamic tensions, are not solvable. There is no magic pill or series of steps that fixes and resolves the tension once and for all so that you can move on. Instead, polarities reflect constant tensions that must be managed, even though the intensity of the tensions will vary over time, based on how well you manage between the polarities.

A situation is more likely a problem to solve rather than a polarity to manage if:

- The situation has an end point and is not ongoing;
- The alternatives are independent, and function well on their own;
- It's an either/or decision-making process (e.g., Do we hire Jane or Marie? Where should we go to lunch? What questions should we include on our survey?); and/or
- The situation is about making choices on a continuum, such as low to high quality. For example, some organizations will make deliberate decisions to allow certain defects that will be fixed with later releases in order to reach early adopters. That said, the problem to solve with this example is identifying the acceptable number of defects. This problem is also an example of a problem nested within one or more polarities, e.g., quality and time to release.

3. The Dynamic Pattern of Polarities

Each polarity represents potential positive and negative results. When mapping a polarity, the positive results are the “upside” and the negative results are the “downside.” This reflects where they are placed in the diagram. See the map on the next page for how these results might be represented for the polarity of uniformity and customization in the context of developing software.

¹ Structure and flexibility is a polarity reflected in trends between preferred development tools, for example the Waterfall Model representing a more linear, structured process and Agile representing a more flexible and emergent process.

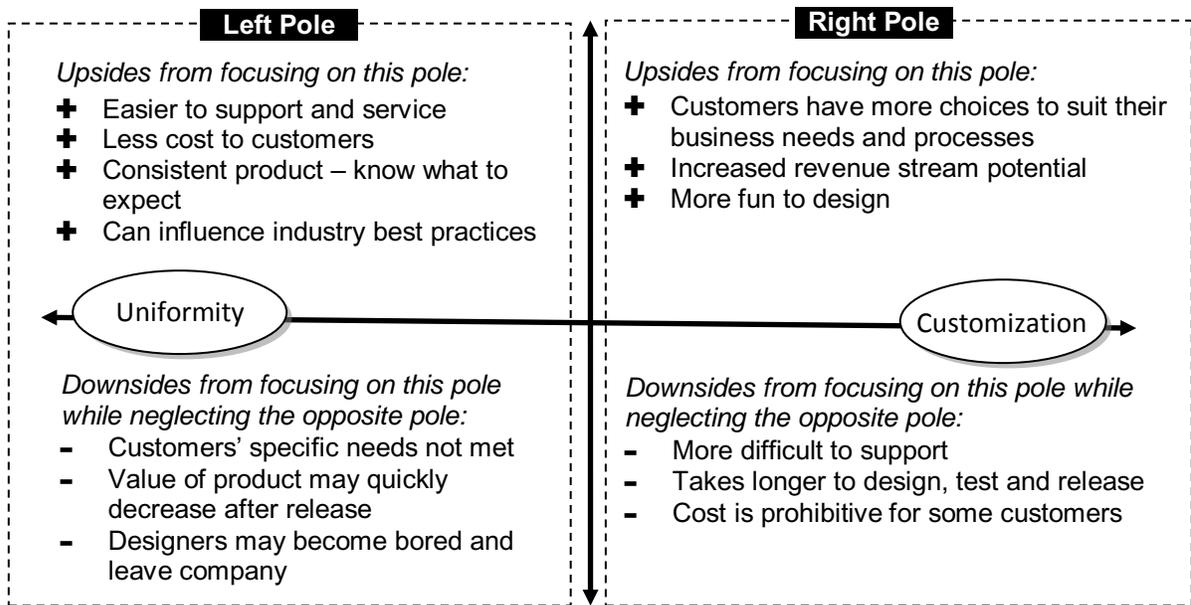


Figure 2: A sample polarity map showing the upsides and downsides of a polarity

The goal in polarity management is to experience the upside of both poles and to minimize the downside of both poles. It does not mean that both poles are equal in priority or level. The degree of uniformity and customization are deliberate choices with the awareness of the costs and benefits of those choices and the interdependent nature of the poles.

We focus on one pole because we want to achieve the attached benefits, e.g. – software that is easy to support and service. When we don't recognize that one factor is part of a polarity, an over-focus on one pole at the exclusion and neglect of the other pole causes us to begin experiencing the negative results associated with the original pole, e.g. – software that won't meet everyone's needs.

Systems thinking literature introduces the concept of *balancing feedback*, where “change in one part of a system results in changes in the rest of the system that restrict, limit or oppose the initial change” (O'Connor & McDermott, 1997). Barry Johnson has been working on the Polarity Management Model and set of principles since 1975. He created a way to map the system oscillation that occurs between the upsides and downsides of a polarity.

3.1 A Poorly Managed Polarity

Let's take the opposing tensions of *time to release* and *quality* and imagine a poorly managed polarity over time:

- 1) An organization has prided itself on beating competitors to market and having early adopters of its product. The rewards have included premium prices for new software releases and a highly motivated excited workforce that prides itself on its creativity and competitiveness. However, parts of the organization have little patience for quality testing and protocols.
- 2) The organization realizes that it has been receiving too many customer complaints about defects in the software. Customers are switching to other, more stable products offered by competitors, and bad reviews about quality have caused a significant decrease in new customers. The company has also had to pay significant amounts of money to clients who experienced catastrophic failures and threatened to sue over damages. Executives in the organization recognize that something needs to change and make the claim “quality is now our number one priority.”

- 3) Strict quality protocols are put into place along with a highly motivated, newly created quality assurance team that is determined to not approve releases with defects. New marketing campaigns are created around a commitment to quality assurance and customers are becoming reassured by promises of worry-free implementations. However, the organization is incredibly cautious and has completely prioritized quality assurance at the expense of any pressures to release by a promised timeline.
- 4) Customers start to complain about continued delays in implementation and start cancelling orders as the organization tries for a perfect product. Testers become nervous about whether they've thought of every possible testing script, even though the Business Analysts had provided information and helped write testing scripts for the needs identified by the customers. Multiple departments in the organization become frustrated at the Quality Assurance Department and begin pressuring the Executives to focus again on developing "good enough" software products quicker. Executives agree and start minimizing the role of the Quality Assurance Department in the development and release cycle.
- 5) Phases 1 through 4 repeat over time, unless recognized and proactively managed or until the organization goes out of business.

3.2 How this Maps

The black arrow in each diagram below shows the dynamic shift within and between poles.

1. The organization focuses on the actual and perceived advantages of one pole (time to release) without also prioritizing the other pole (quality).

This causes the organization to experience the downsides of that pole.

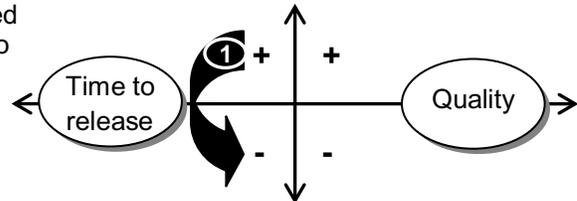


Figure 3: Dynamic showing shift from upside to downside of the left pole.

2. Experiencing the downside of one pole (time to release), causes the organization to react so that it can prioritize and experience the advantages of focusing on the opposite pole (quality).

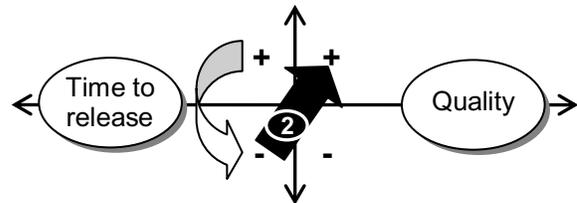


Figure 4: Dynamic of self-correction, showing the shift from the downside of one pole to the upside of the opposite pole.

3. The focus on the actual and perceived advantages of one pole (quality) without also prioritizing the other pole (time to release) eventually causes the organization to experience that pole's downsides.

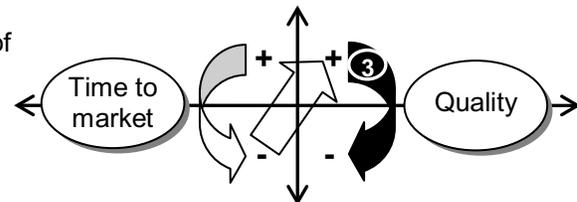


Figure 5: Dynamic due to over focusing on the right pole at the expense of the left pole.

4. Experiencing the downsides of this pole (quality) causes the system to adjust again so that it can prioritize and experience the advantages of focusing on the opposite pole (time to release).

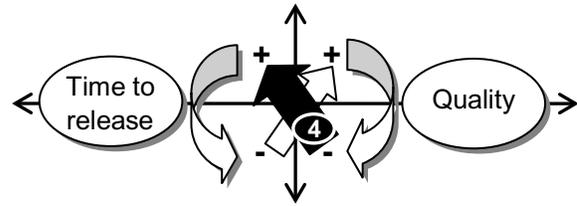


Figure 6: Dynamic of self-correction, recognizing the downsides of one pole influencing a focus on the opposite pole in reaction – back to the starting place.

Over time, if the system continues to treat these opposing tensions as an “either/or” choice, it creates an infinity loop: The paradox of polarities is that “in order to gain and maintain the benefits of one pole, you must also pursue the benefits of the other” (Johnson, 1992).



Figure 7: The system oscillation that occurs between polarities

3.3 Recognizing the Polarities in Your System

You might be thinking that the above example is extreme and that your organization has already put steps in place to balance the focus on time to development and quality or the other polarities listed above. To recognize relevant polarities in your system, ask yourself and others:

- a) What ongoing issues or conflicts are you regularly facing and trying to solve?
- b) Where are you feeling stuck?
- c) What are you or those around you trying to move from?
- d) What are you or those around you trying to move towards?

Each of these questions will give you clues to polarities relevant to you.

4. Managing Polarities

Awareness is the first step to proactively managing polarities so that you can experience the benefits of both sides and have early warning signs that allow you and others to self-correct before negative ramifications become too serious.

The steps for managing a polarity are:

- 1) Identify the polarity you want to manage better.
- 2) Map the polarity to form a complete picture.
 - a. Use value-neutral words for the poles (e.g., flexibility and structure vs. willy-nilly and rigid)
 - b. Identify the critical upsides and downsides of each pole. The upsides are what you value and want to maintain, while the downsides are what you fear and want to reduce, avoid or eliminate.
 - c. Identify where you are right now, based on the behaviors or impacts that are showing up. In what ways are you out of balance? Where are you experiencing the upsides of either pole and where are you experiencing the downsides?

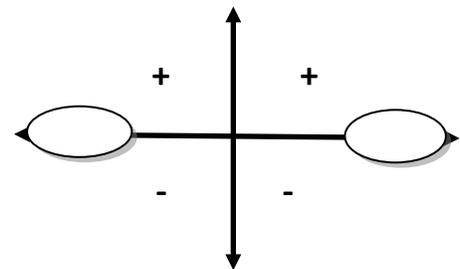


Figure 8: Blank polarity map

- 3) Identify action items that will help you leverage and experience the upsides of both poles. The action items can address both poles at the same time, or be individual actions that support each pole separately, as long as both poles are addressed. When action items are chosen, assign accountability – who will accomplish each action item by what date. Have each action item be specific, measurable, achievable, reasonable, and time-oriented (SMART).
- 4) Identify critical warning signs that will alert you or the appropriate persons when the system begins sliding into one of the downsides. Like with the action items, specify how the warning sign will become known and communicated. For example, would the warning be customer complaints and/or project delays? If so, how many or about what types of things? Who (individual or group) would first notice the warning sign and how would that be communicated to key stakeholders? What reports, charts or dashboards does your organization use that might signal warning signs?

5. Using Polarities as a Communication and Conflict Resolution Tool

Any time there are individuals and groups who have competing priorities and points of view, conflict can easily arise and it becomes an issue of who is right or who has more power. The polarity management process can help you achieve shared understanding and resolve conflicts, because it:

- 1) Explains polarized viewpoints,
- 2) Clarifies what the different perspectives value and fear about their point of view, and
- 3) Helps identify the common purpose and common fears that can bring both perspectives together.

In the Dalai Lama's Book of Wisdom, he wrote:

If we look at the situation from various angles, such as the complexity and inter-connectedness of the nature of modern existence, then we will gradually notice a change in our outlook, so that when we say "others" and when we think of others, we will no longer dismiss them as something that is irrelevant to us. We will no longer dismiss them as something irrelevant to us. We will no longer feel indifferent (2000).

His words describe the outcome of using the polarity management process between divergent points of view: an appreciation of the other side and recognition of how it may interconnect in meaningful ways with your perspective.

5.1 Polarized Points of View

In conflict situations, each pole typically represents one side's "Truth" and the other side's "Error." When one side is perceived as right and the other wrong, it represents either/or thinking. In these cases the side with the most power or the side which is currently most entrenched wins until the pain of the current situation becomes significant enough to overcome the status quo. Do any of the following statements sound familiar?

- "Software should be released 100% free of defects!"
- "Testing takes too much time and doesn't take into account all the real business scenarios used by the customer."
- "The people in charge don't appreciate us and how important it is to complete thorough testing protocols."

These types of statements are indicative of polarized views.

5.2 Values and Fears

Once you've identified the polarized points of view, list what each side values and fears. What you value about your perspective shows up on the upside of your pole and what you fear is on its diagonal downside. And the same is true of the other side's perspective. For example, if you are wrestling with the polarity of planning and flexibility, and you want more time and value placed on planning, your view might be reflected as:

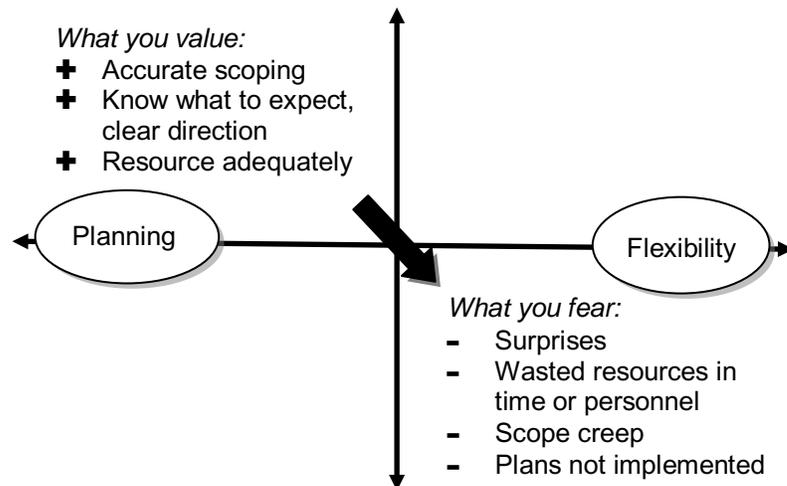


Figure 9: Values and fears mapped from the planning perspective

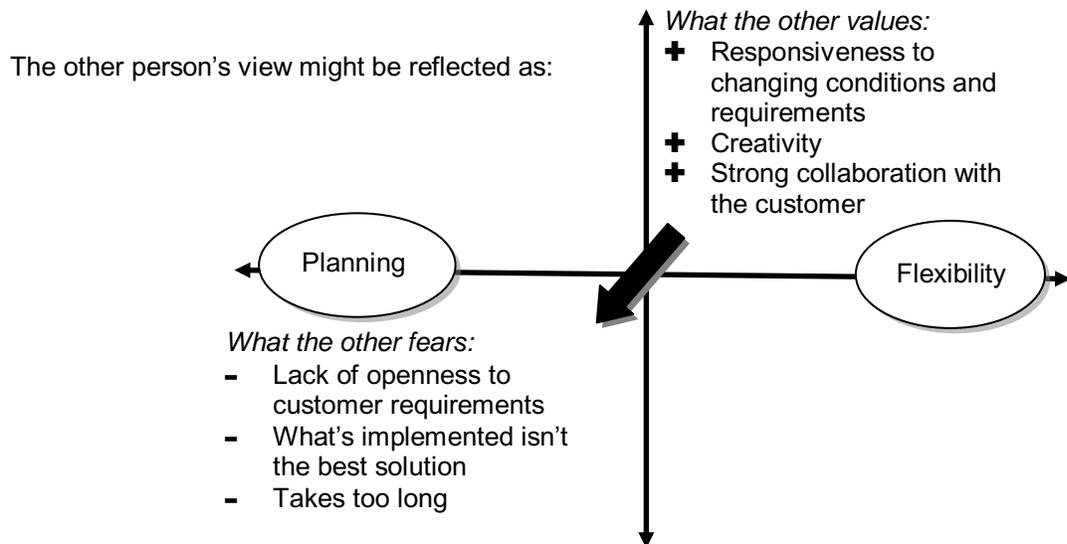


Figure 10: Values and fears mapped from the flexibility perspective

When you are in a polarized situation, each party is already anticipating the downsides of the other view – either because they experience those downsides, have experienced them in the past, or are simply afraid that they might occur. Recognizing this relationship between the two sides is critical for change management efforts as well, in creating a fuller picture of the situation, legitimizing multiple perspectives and anticipating potential resistance.

5.3 Higher Purpose and Deeper Fear

The unifying step within this process is to identify the higher purpose and the deeper fear that is common to both poles. Examples of potential higher purposes for two sides in conflict over planning and flexibility may be anything from desire for a working, viable product that fully meets or exceeds customer expectations to continued success and profitability of the organization. A shared deeper fear may be no faith in the software eventually resulting in no faith or confidence in the organization.

The higher purpose goes above the upsides and the deeper fear goes below the downsides, as shown in the combined example of the polarity map on the next page.

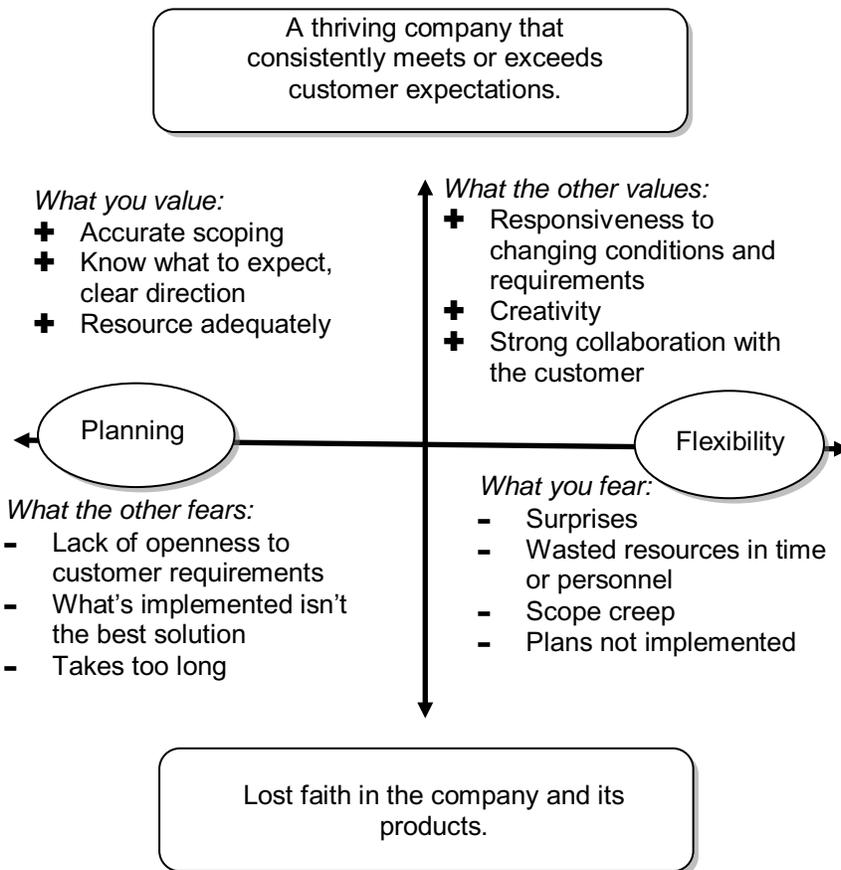


Figure 11: A complete polarity map, applied to a conflict situation

5.4 Using this for Communication and Conflict Resolution

So, how might you apply this process?

- 1) Use it for yourself, to gain greater awareness of what other perspectives might be, and to understand why those beliefs and opinions are valid. Change how you interact with others by not labeling their perspective as misguided (or worse). Mention how you can understand how they might be worried that "x" could result in "y". Collaborate with the other person(s) on how to minimize the risks of the downsides occurring.

- 2) Use it as a sales tool, such as with executives or customers. Mapping the different perspectives will help you make a persuasive case for change. You can clearly articulate what you see as the shared purpose, the values and advantages to both perspectives being shared, and what you plan to avoid (e.g., the downsides). You can either have potential solutions already in mind, or collaborate with the applicable stakeholders on appropriate actions.
- 3) Use it within a team or between teams by naming one or more polarities, collaborating on brainstorming and decision-making to fill in the map, sharing perspectives, identifying action items and warning signs, and assigning accountability as applicable.

6. Multarities

The scope of this paper is to address a process for mapping and managing two polarities at a time. In reality, we are often dealing with “multarities,” multiple opposites that are interacting with each other at any particular time. For example, most projects must balance the “Iron Triangle” (Ambler, 2003-2006) of cost AND time AND quality AND scope. Those four factors actually reflect six polarities:

- | | |
|---------------------|----------------------|
| 1) Cost and time | 4) Cost and quality |
| 2) Cost and scope | 5) Time and scope |
| 3) Time and quality | 6) Quality and scope |

You may also find that one polarity has several sub-polarities nested within it. In choosing what to focus on, identify what is most currently an area of pain or discord for you and applicable stakeholders.

7. Conclusion

This paper presented a way of seeing and managing complexity, specifically how to identify and manage opposing dynamics, or polarities. This is not a process applicable for every situation, such as when addressing a problem vs. a polarity. Additionally, polarities are everywhere, but not every polarity needs your attention. Use this process to work the polarities that need more active management to help you achieve your goals.

In summary, the ability to manage polarities will help you:

- Recognize the oscillation that occurs in any system or organization when polarities aren't managed well. Awareness of this dynamic will help you feel less powerless in the midst of complexity and help you proactively identify choices to move closer to your ultimate goals and higher purpose;
- Get unstuck when you feel caught between conflicting choices or priorities;
- Recognize when a recurring problem you keep solving is really a polarity to manage;
- Increase your understanding of what causes resistance and how to approach communication and change efforts in more open and engaging ways; and
- Create dialogue with others about what is important and why, in order to reduce conflict and resistance and create momentum towards a shared goal.

Have fun with this process as you use it to help manage the complexity around you. Especially, use polarity management to stop repeating the same steps while expecting different results and to focus on important, shared goals between stakeholders instead of getting stuck in defending a specific position.

Appendix

Acknowledgements

This author would like to thank her official PNSQC reviewers for their thoughtful feedback and insights: Ian Savage and Douglas Reynolds. Your time and expertise in support of this paper are valued!

References and Additional Resources

Ambler, S. (2003-2006). *The “broken iron triangle” software development pattern*. Retrieved from <http://www.amblysoft.com/essays/brokenTriangle.html>

Boehm, B. and Turner, R. (2003). *Balancing agility and discipline: A guide for the perplexed*. Boston: Addison-Wesley.

Christensen, K. (2009, Winter). Building shared understanding of wicked problems [Electronic version]. *Rotman Magazine*, 16-20.

DeMarco, T. and Lister, T. (2003). *Waltzing with bears*. New York: Dorset House Publishing.

Fletcher, J. and Olwyler, K. (1997). *Paradoxical thinking: How to profit from your contradictions*. San Francisco: Berret-Koehler Publishers.

Johnson, B. (1992). *Polarity management: Identifying and managing unsolvable problems*. Amherst, MA: HRD Press.

O'Connor, J. and McDermott, I. (1997). *The art of systems thinking: Essential skills for creativity and problem solving*. San Francisco: Thorsons.

A Blank Map

