



Process Innovation

Howard Smith

CTO CSC European Group
Corporate Office of Innovation
Computer Science Corporation

hsmith23@csc.com

books:

Business Process Management:

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There are solutions in polarities

Part 10 in a series on P-TRIZ

It turns out that whole books have been written about how to avoid solving problems!

In a quest to better understand organizations, Barry Johnson founded four of them: a 24 hour crisis intervention center, a community-based newspaper, a residential treatment center for addicted adults and a manufacturing company. In the process, he received his Ph.D. in Organization Development. An independent consultant in the combined areas of management development and organizational design, Dr. Johnson has worked in both the private and public sectors in the United States, Canada and Mexico. Since 1975 has developed a set of management principles called Polarity Management.

Dr Johnson has a message for us, "The bad news is that there are a large number of unsolvable problems in your life, both at work and at home. I'm not talking about difficulties you could solve if you had more money, time, or other resources. I'm talking about difficulties that are inherently unsolvable, ones you cannot solve with resources. The good news is that you can stop trying to solve them. Instead, you can improve your skills in identifying unsolvable problems and managing them well."¹

Is he right? Are there unsolvable problems?

Johnson points out that many of the current trends in business and industry imply moving from one way of thinking to another. For example, it is currently popular to move:

- "From neglect of the customer to focussing on the customer"
- "From competition to collaboration"
- "From individual to team"
- "From centralization to decentralization"
- "From autocratic management to participatory management"
- And in the field of business process management: from rigid structures (repetitive clerical workflow) to flexible arrangements (ever-morphing knowledge work).

¹ Johnson, B., *Polarity Management*, HRD Press, 1992

These trends imply the existence of a problem, for example, “We need to move *from the problem* of centralization *to the solution*, which is decentralization”. “We need to move from *the problem* of ignoring the customer to *the solution* of being customer centric.” Such thinking certainly permeates many board rooms, and the work of management consultants! For unless there is a problem to solve how would they get paid?

Johnson argues that each of these trends is better understood as a polarity to manage. Problem-solving skills, he claims, while extremely useful when applied to solvable problems, can get in the way when there is a polarity to manage. Polarities embody sets of opposites which cannot function well independently. Because the two sides of a polarity are interdependent, there is no way to choose one as a “solution” and neglect the other. The objective of polarity management is to get the best of both opposites, while avoiding the limits of each. For example, what should be done with a rigid manager? How can they become more flexible, yet at the same time manage with clarity and authority? Johnson calls such a problem unsolvable, claiming that all effective leaders manage the clarity/flexibility polarity. Such managers, he argues, are “not afraid of the ambiguity.”

All processes are polarities

If Johnson is right his work may have great relevance in the field of business process change. Processes embody all kinds of opposing forces. Examples include:

- We need *inventory* in order to ship goods on demand, but we don't want the cost of inventory in order to be *lean*.
- We must be *productive* implying a repeatable process that can easily be *automated*, but we must also be *flexible* in order to accommodate *change*.
- Customers demand processes that focus on their *individual needs* but such processes must not generate *extra work* lest service levels are degraded.
- We must define our processes explicitly so that they can be *measured and improved* but they are *evolving continuously*. How will we ever pin them down?

The field of business process management is littered with such ambiguities, dilemmas, paradoxes, conflicts and contradictions. And this is why Johnson's work on polarities is relevant. But is he right that polarities have no solutions implying that we must find a compromise instead?

The Polarity Map

Johnson's methodology for managing polarities centers on the use of a polarity map. The map is represented by two poles – the opposite aspects of the polarity. Each pole is also divided into halves. The upper half represents the positive outcomes that result from focussing on that pole. The lower half represents the negative outcomes that result from focussing on that pole and neglecting the opposite pole. Seeing all four quadrants is “seeing the whole picture” (the structure of the dilemma). Figure 1 is an example.

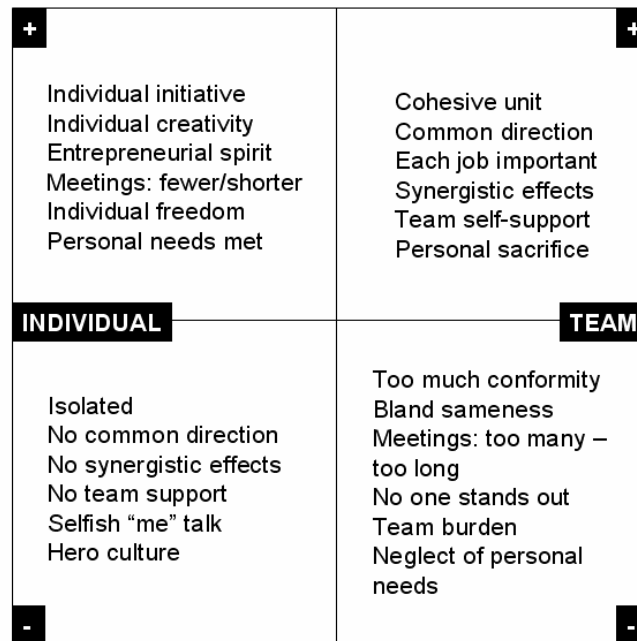


Figure 1 – A polarity we all recognize

The polarity map is a simple and effective business diagram. It can be used to illustrate many commonly occurring, but perplexing, dilemmas that imply a choice between conflicting or contradictory strategies. Those involved in business process change should buy a copy of Johnson's book. It is a wealth of wisdom.

The heart of the polarity methodology is to move around the diagram, from quadrant to quadrant, exploring the dynamics of the dilemma. The technique is useful in exploring many different types of polarity, such as:

Cost	and	Quality
Market driven	and	Product driven
Centralized	and	Decentralized
Innovation	and	Standardization
Autocratic	and	Participatory
Process engineering	and	Product engineering
Planning	and	Taking action
Shared systems	and	Custom systems

Think of polarities you care about. Now try to identify the upsides and downsides to each pole. Then ask: Does the normal movement through the model correspond to your experience with the polarity? If so, it's the start of a good model.

Can we do more than just cope with polarities?

Johnson believes we must learn to live with polarities. By doing so, he argues, we can build more effective working practices, improved processes and better organizations. But do we really have to cope with polarities via compromise? Johnson says there are no solutions. I am not so sure. It all hinges on what a polarity really is. Let's look at one example from his book (Figure 2.)

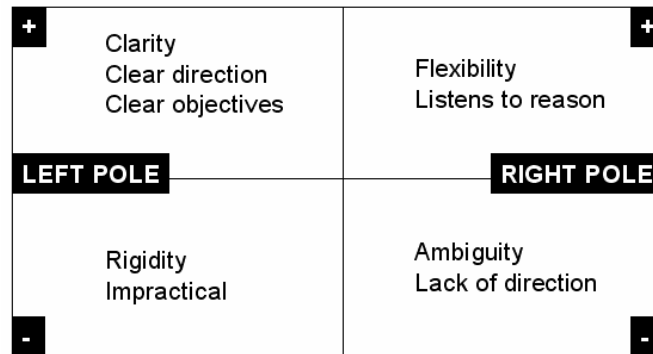


Figure 2 – The management dilemma polarity

Should a leader be clear or flexible?

Johnson's answer is a resounding "Yes!" It is more effective to be clear *and* flexible than to focus on one aspect or the other. Yet staff can interpret clarity as rigidity and flexibility as a lack of direction. The polarity is between "It's my way or the highway!" and being "Wishy-Washy". At one extreme staff will say that "You never know where management stands" and at the other "They" don't listen.

So why not just tell rigid bosses to be more flexible and ambiguous bosses to be clearer? The rigid boss needs to listen to reason, adjust to new data and become more flexible. The weak boss needs to be clearer, to let us know what she expects and to stick with an agreed direction. The problem is there are not two bosses!

Johnson gives a story about a manager who thought she was being clear about important business goals but was interpreted by staff as being rigid and inflexible. The story goes on to explain how, after attending a workshop on polarity management, she found she could express her goals in a way that accommodated listening and adapted to input from others.

Before exposure to this training the manager appeared, to her staff, to be in one pole only: rigidity. To the manager this was seen as a (useful) strength. Her staff by contrast saw it as a (harmful) weakness and could not accept and execute on her strategy. Is there a solution?

The power of Johnson's notation is that it can capture both the polarity (pluses and minuses inherent to any pair of opposing forces) and can also be used to illustrate a solution from any one perspective. Just add arrows.

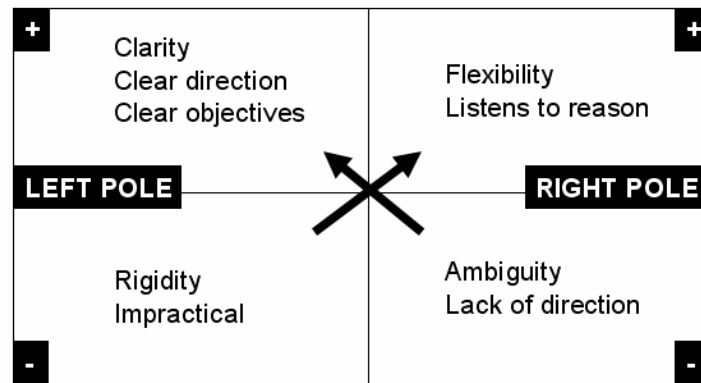


Figure 3 – Arrows indicate solutions from different perspectives

To the manager the *solution* was easy. The organization needed to change from ambiguity (lower right) to clarity (upper left). Staff however held a different view. For them to accept any strategy it had to encompass flexibility, since any rigidly held view could not possibly take account of the practical obstacles to implementation that only they could see on the ground. Management should listen and adapt. Staff appreciated clarity, but within limits.

Johnson argues that trying to find a solution to such a polarity is counter-productive. Better, he argues, to manage the situation by moving around the diagram as required – clear one moment, ambiguous the next, allowing in staff comment, being seen to be flexible, etc. There is wisdom in his advice. But one cannot help feeling a sense of disappointment in polarity management. Why give up on a solution so early?

Case study

Johnson tells the story of a corporate strategy group debating whether they should be product driven or market-driven. The debate, he points out, could have gone on for some time – implying no solution exists. What proved helpful in this situation, he claims, was identifying the issue as a polarity to manage, rather than as a problem to solve. While I agree with the first part, I don't agree a solution could not be found.

To the TRIZ practitioner the very act of identifying a polarity (they are called “contradictions” in TRIZ) is useful. Not only does it pinpoint a problem, it points the way to the existence of a solution. In TRIZ, the presence of a contradiction defines what it means to be an inventive problem.

Here is the polarity as developed by the strategy group:

<p>+ Pride in our product Doing what we do best Listening to ourselves – knowing our limits</p> <p>PRODUCT-DRIVE</p>	<p>Listening to the customer + Make what customer needs/ wants Being customer-responsive</p> <p>MARKET-DRIVEN</p>
<p>Out of touch with the customer Make products customer does not want</p> <p>-</p>	<p>Loss of pride in product Doing what we do not do well Out of touch with ourselves – Over-extended, “Who are we?”</p> <p>-</p>

Figure 4 - A dilemma for all companies

For Johnson, it was sufficient to propose a direction for the future which included the upsides of both the product- and market-driven poles. He felt satisfied when the group had accepted that their argument over product- or market-centric thinking was pointless. It had become clear to everyone that either focus without the other would not work. The vision statement they developed was:

We are a manufacturing organization with great pride in our products and services. We are highly customer-responsive without losing sight of our strengths and limitations.

This is a compromise. It embodies no solution. And this is the issue I have with Johnson's methodology. My conjecture is this:

1. There are solutions to many of Johnson's polarities.
2. Some of the examples he gives are not true polarities. In some cases the contradiction has not been identified (i.e. the root cause contradiction)
3. Once a real contradiction is found, it is possible to find a solution by surmounting the contradiction using any number of inventive patterns.

If we accept that there are no solutions to contradictions and dilemmas we can make no progress beyond spouting weasel words. I cannot accept that.

Semantics

What is a solution? What is a problem? It is all a matter of semantics. So before we move on, let's look at the dictionary terms for many of the words used in Barry Johnson's book. As you will see, there are important, yet subtle, differences of meaning and emphasis.

Concept	Definition	Examples
Opposite	Oposing concepts	North-South, Up-Down, Hot-Cold, Push-Pull, Standardized-Customized, Rigid-Flexible
Polarity	A <i>relation</i> between two opposite attributes or tendencies	Selfishness: The Individual versus society Peer review: Critical analysis or encouragement Adaptability: between design opposites Suitability: Rigid when needed, Flexible at other times Work-Home Life Balance Motivation: Words and Deeds Inertia: Stability and Change
Dilemma	A state of uncertainty or perplexity, especially when requiring a choice between equally unfavourable options	Applies when both poles are harmful – I don't know whether to Stand My Ground or to Give In?
Paradox	A self-contradiction – a statement that is necessarily false	I need to make standard products to keep the cost down and I need to make custom products to meet individual customer needs
Conflict	Opposition between two simultaneous but incompatible feelings A state of opposition between ideas An incompatibility of dates or events The quality of being unable to exist or work in congenial combination	Love-Hate relationship Capitalism and communism How can I be at two meetings at the same time? John and Bill just cannot work together! These two elements cannot be in the same place in the design but need to be for it to work We need to make a centralized decision in a decentralized organization
Contradiction	Opposition between two conflicting forces or ideas A statement that is necessarily false (as Paradox) The relation between opposed entities (as Conflict) A contradiction in terms	(Similar to paradox) A large yet portable item Economies need to move goods: Non-polluting cars and trucks Getting into Space: The rocket needs to be light and thin to go high, and heavy, strong and fat to carry fuel and withstand take-Off

Table 1 – Dictionary definitions and examples

There are solutions

It's simply not true that there are no solutions to contradictions and polarities. Here are eighteen:

1. An umbrella embodies a contradiction. It must be small to be portable and large when raining. Engineers surmounted the contradiction by creating a folding mechanism.
2. A sleeper sofa provides a comfortable place to sleep at night while taking up little additional space during the day.
3. Bi-focal glasses can be used for both reading and driving.
4. A company should be large enough for its employees to enjoy a multitude of benefits, yet should be relatively small in order to be adaptable and competitive. There are at least two solutions. A group of small, independent companies united under a single corporate umbrella. Sourcing goods and services from an aggregator of procurement.
5. The price of a product must be high enough to increase sales revenue, yet low enough for the product/service to be affordable to more people. The solution: conditional price discounts. When a newly introduced product/service is offered at full price and discounted later, discounts are provided by way of special coupons.
6. The inertial forces that push a driver forward during an automobile collision constitute a special condition – one that causes the seat belt to tighten immediately. In normal driving conditions, however, the seat belt is relatively loose.
7. A self-service website shifts work to the user, allowing for custom delivery without adding extra work for the service provider.
8. Mass-customization. Advanced manufacturing processes now automate the production of a standard “customized” product.
9. It is possible to model processes that change. The degrees of freedom are modelled. The process is executed by a workflow engine even though its design is flexible in operation.
10. Inertia can be overcome through a change in culture.
11. A tipping point in the adoption of a new product or service can be created through a self-reinforcing flow of information between consumers.
12. A home-work balance can be achieved by “home” working – made possible by a solution called the Internet.
13. With virtual meetings it is possible to be in every meeting, even those that take place at the same time.
14. John and Bill can work together if their work is partitioned and later integrated.
15. Competition versus collaboration: Co-opetition exists in many industries. Commerce flows when it should not be able to. It does so via intermediaries and exchanges.
16. A matrix style organization solves the problem of centralization over decentralization.

17. Rockets have gone into space because someone invented the idea of booster stages and separation of redundant weight.
18. The hydrogen combustion engine has the potential to solve an important contradiction inherent in present petrol-powered vehicles: The air coming out of the tail pipe will be cleaner than the air going in. Forget global warning and CO2 warnings: The more cars the better!

Engineers and business thinkers solve problems by surmounting, not compromising, the conflict, contradiction or paradox. That's precisely what it means to solve a problem and to be "inventive." In short, I disagree with Johnson. Polarities are problems and they can be solved. They don't have to be managed around.

To be fair to Dr. Johnson, perhaps he chooses to look only at polarities that pose problems that are very hard to solve or that would involve very novel or impractical solutions. Or perhaps he works with teams that have decided they do not wish to solve the problem. All of Johnson's examples involve people one way or another, just as business processes do. Yet the trouble with people, as we saw in Part 7 of this series, is that they are too quick to avoid problem solving.² Systematic problem solving does not come naturally. The idea that any problem can be solved if the appropriate methodology is brought to bear is a bitter pill to swallow. Why? To admit all problems are solvable requires people to act. They must find the solution, and then implement it. And this means hard work, with the risk of failure. God forbid someone else might find the solution!

A psychological inertia towards problem solving, and therefore towards progress, is rife in many organizations. I know several organizations that spend significant resources endlessly creating ideas and identifying problems. Yet they hardly ever take on the hard work to solve them. The ideas rarely get out of the creative suite. They lie dormant in databases of "Our Best Ideas" ready for the "Ideas for Next Year" category. And this is why I cannot help thinking that Johnson's message could be abused and let people off the hook too readily. In effect he says, "There are no solutions, so why keep looking?" Surely it would be better to say, "There are always myriad solutions to a problem. Your job is to find the best and then to implement it."

How?

Polarities are unsolved problems

To understand how Johnson's polarities lead naturally to solutions we shall look closely at what a polarity actually is. Taking his definition:

A polarity: sets of opposites which can't function well independently.

In each of Johnson's examples there are just two opposites, called poles. He says:

The poles are independent. You cannot choose one as the solution over another. The objective is to get the best of both worlds while avoiding the limits of each.

² Smith, H., "The Trouble with People," part 7 in a series on P-TRIZ", BPTrends.com

He is saying that the “system” contains two functions, the poles, both of which are both useful and harmful. Using modern TRIZ notation we get:

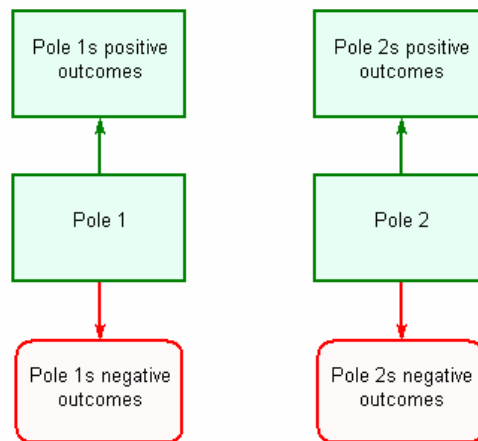


Figure 5 – Two independent “Johnson poles”

Yet this model does not capture everything about a polarity. Johnson says that the objective is to get the best of both worlds, that is, to minimise the negatives and emphasise the positives. But this is a statement about the solution direction, not the problem. He also says that the poles cannot operate independently, i.e. that they are somehow connected. There must therefore be a common function. Yes, you’ve got it, that’s the polarity. And because Johnson is trying to find management strategies to cope with the polarity, we must consider the polarity harmful. Indeed, because the two poles are viewed as undesirable extremes by Johnson, they too should be considered harmful, yielding:

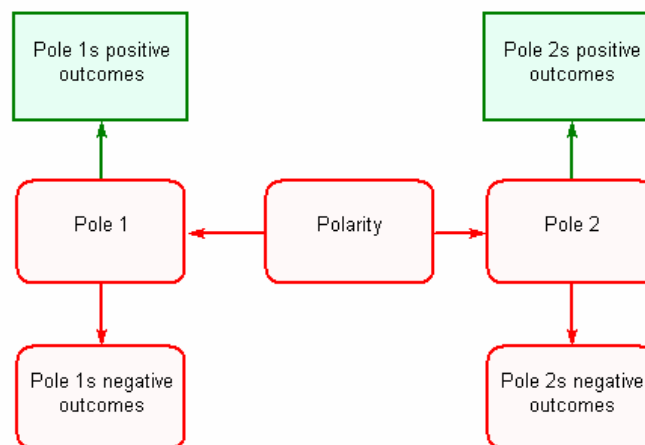


Figure 6 – General TRIZ model of a Johnson polarity

What then is this polarity? It is nothing more than an *abstract* harmful function in the system created by the tensions between the two poles, each of which have useful and harmful side effects. Polarity is therefore an illusion, a manifestation of a troubled and tangled situation in

which useful and harmful functions play off each other in a dance of causes and effects. One could say that the polarity and the poles in Figure 6 are illusory. One might just use:

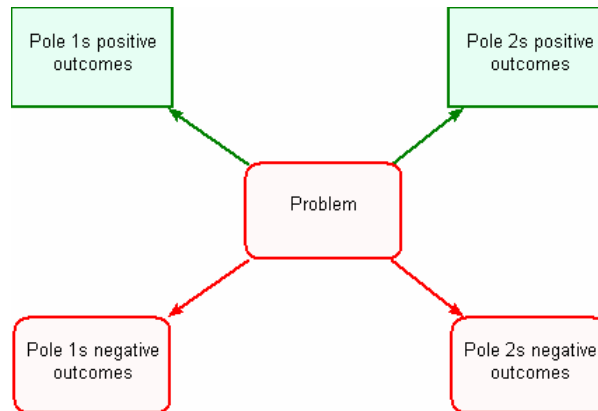


Figure 7 – Are there really two poles?

What Johnson is doing is dividing problems into opposing forces. He is decomposing along the lines of useful and harmful functions. This is TRIZ. By doing so, he glimpses solution *directions*, but chooses not to tip over into the solutions space. To illustrate this, let's build a TRIZ model from the polarity map shown in Figure 1:

+	<ul style="list-style-type: none"> Individual initiative Individual creativity Entrepreneurial spirit Meetings: fewer/shorter Individual freedom Personal needs met 	+
INDIVIDUAL		TEAM
	<ul style="list-style-type: none"> Isolated No common direction No synergistic effects No team support Selfish "me" talk Hero culture 	<ul style="list-style-type: none"> Too much conformity Bland sameness Meetings: too many – too long No one stands out Team burden Neglect of personal needs
-		-

We'll build the model in three stages – first one pole, then the other and finally we'll put it all together. Here goes:

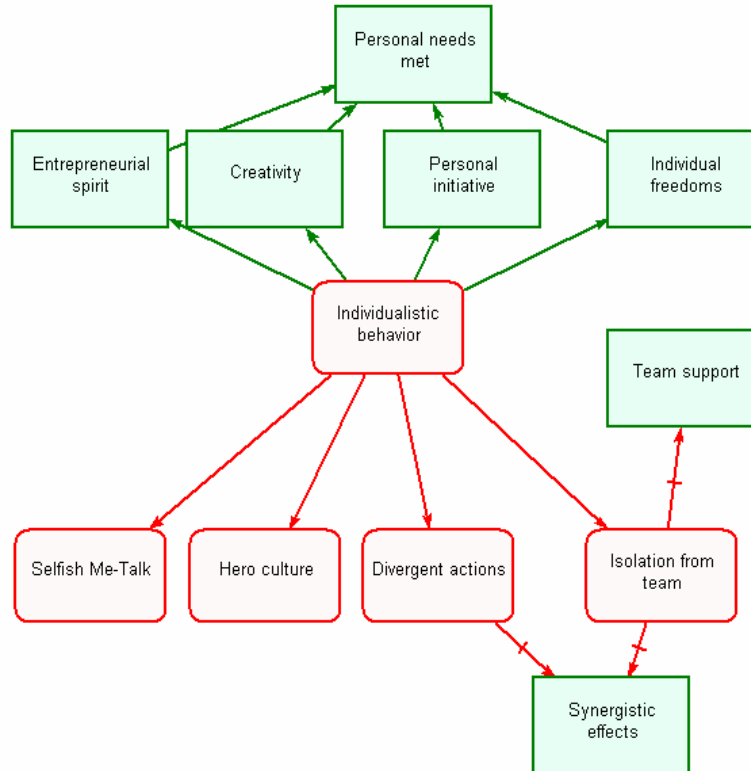


Figure 8 – Left pole: Individualistic behavior

As you can see, all of the positives in Johnson's polarity map are in the upper part of the TRIZ model. I felt that "Personal needs met" is produced from the other positives rather than standing alone. This type of causal link cannot be shown in a polarity map, but can in a TRIZ model. In similar vane, Johnson lists "Synergistic effects" and "No Synergistic effects" in two different quadrants. This makes no sense to me. Listing the same function in two boxes – one negative and one positive is a cop out. So let's collapse those to one positive function "Synergistic effects." The function is counteracted by "Divergent actions" and "Isolation from team." Similarly, "team support" must be positive, counteracted by "isolation from the team" arising from "individualistic behavior."

Now to the other pole:

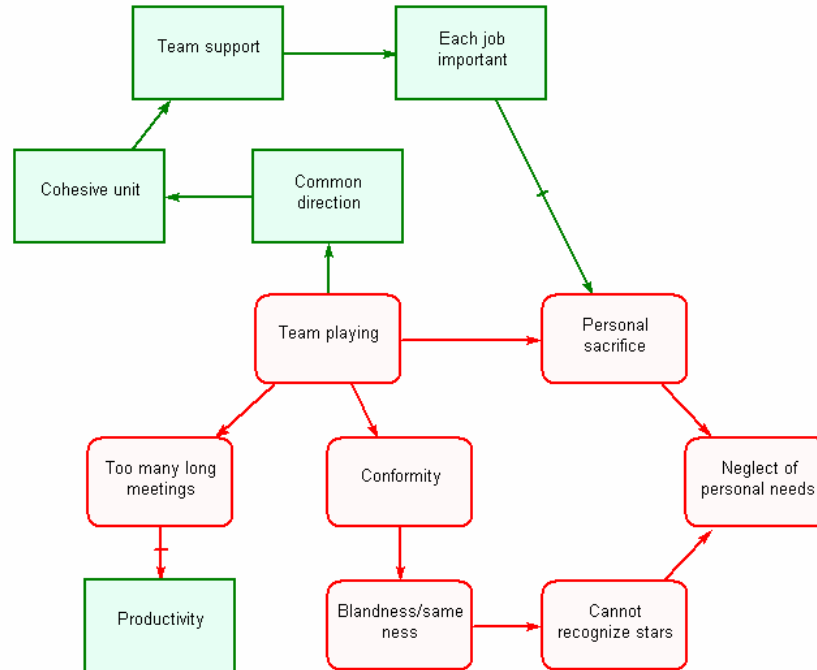


Figure 9 – Right pole: Team playing

Once again, this pole is considered harmful, since Johnson views poles as extremes to be avoided at all cost. Here, the interplay between the positives and negatives could be argued. It seemed logical to me that “each job being important” counteracts the personal sacrifice of “team play”, and this arises from the chain of effects that begins with “common direction”. Similarly, “conformity” leads to “cannot recognize stars” and “neglect of personal needs.” I also added “productivity,” a function Johnson does not list explicitly but implies, which is counteracted by “too many long meetings.”

There are some important things to observe about the two models:

The Johnson map contains redundant information. He lists “neglect of personal needs” and “personal needs met” as two different functions. They are one and the same and should be combined. Similarly, “divergent actions” and “common direction” must be the same function. How to produce a single model?

Johnson is unconcerned with a solution, and so simply lists positives and negatives. But surely, team playing and individualistic behavior are both useful objectives, not opposing forces, and each has positive and negative aspects which play against each other.

Taking these pairings into account, a single TRIZ model can be produced. Before this is presented, let’s push a side issue out of the way: the impact on productivity as a result of more frequent or fewer team meetings?

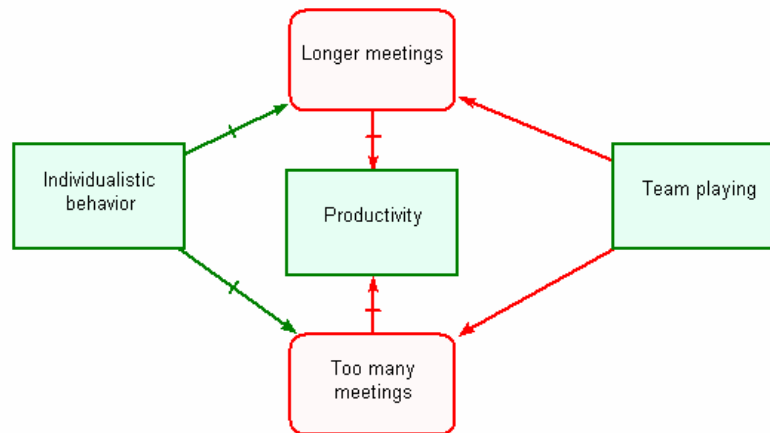


Figure 10 – Impact on meetings

This simple model produces the following solution directions:

1. Find an alternative way to obtain [the] (Individualistic behavior) that eliminates, reduces, or prevents [the] (Longer meetings) and (Too many meetings).
 - 1.1. Find a way to increase the effectiveness of [the] (Individualistic behavior).
 - 1.2. Find additional benefits from [the] (Individualistic behavior).
 - 1.3. Try to increase the effectiveness of the action of [the] (Individualistic behavior) toward reducing the harmful nature of [the] (Longer meetings) and (Too many meetings).
 - 1.4. Consider modifying or influencing [the] (Longer meetings) and (Too many meetings) to improve its being eliminated, reduced, or prevented by [the] (Individualistic behavior).
2. Find an alternative way to obtain [the] (Team playing) that does not cause [the] (Longer meetings) and (Too many meetings).
 - 2.1. Find a way to increase the effectiveness of [the] (Team playing).
 - 2.2. Find additional benefits from [the] (Team playing).
 - 2.3. Find a way to decrease the ability of [the] (Team playing) to cause [the] (Longer meetings) and (Too many meetings).
3. Try to resolve the following contradiction: The useful factor [the] (Team playing) should be in place in order to fulfill useful purpose and should not exist in order to avoid [the] (Longer meetings) and (Too many meetings).
4. Find a way to eliminate, reduce, or prevent [the] (Longer meetings) under the conditions of [the] (Team playing).
 - 4.1. Find a way to benefit from [the] (Longer meetings).
5. Find a way to eliminate, reduce, or prevent [the] (Too many meetings) under the conditions of [the] (Team playing).
 - 5.1. Find a way to benefit from [the] (Too many meetings).
6. Find an alternative way to obtain [the] (Productivity) that is not influenced by [the] (Longer

meetings) and (Too many meetings).

6.1. Find a way to increase the effectiveness of [the] (Productivity).

6.2. Find additional benefits from [the] (Productivity).

7. Find a way to protect [the] (Productivity) from the harmful influence of [the] (Longer meetings) and (Too many meetings).

7.1. Try to compensate for the harmful influence of [the] (Longer meetings) and (Too many meetings) towards [the] (Productivity).

7.2. Try to reduce the sensitivity of [the] (Productivity) to the harmful influence of [the] (Longer meetings) and (Too many meetings).

8. Consider replacing the entire system with an alternative one that will provide [the] (Productivity).

8.1. Consider transition to the next generation of the system that provides [the] (Productivity), but which will not have the existing problem.

8.2. Consider enhancing the current means by which the primary useful function is achieved, to the extent that the benefits will override the primary problem.

8.3. Consider giving up the primary useful function to avoid the primary problem.

I have no doubt that a flood of solutions have occurred to you if you have read this list carefully.

What Johnson regards as an insolvable polarity has many solutions in use by business teams each and every day. My favourite solution, well known to readers of this column, relates to direction 8. Sometimes called **workflow** and other times called **business process automation**, it is a next generation design for human work that amplifies the productivity of individuals contributing within a collaborative business process, removing the need for many coordination meetings that would otherwise be required. This is a solution to the productivity dilemma that Johnson says is a polarity that has to be managed without solution.

The integrated model

Returning to the issue of personal and organizational needs being met, a combined model could look like this:

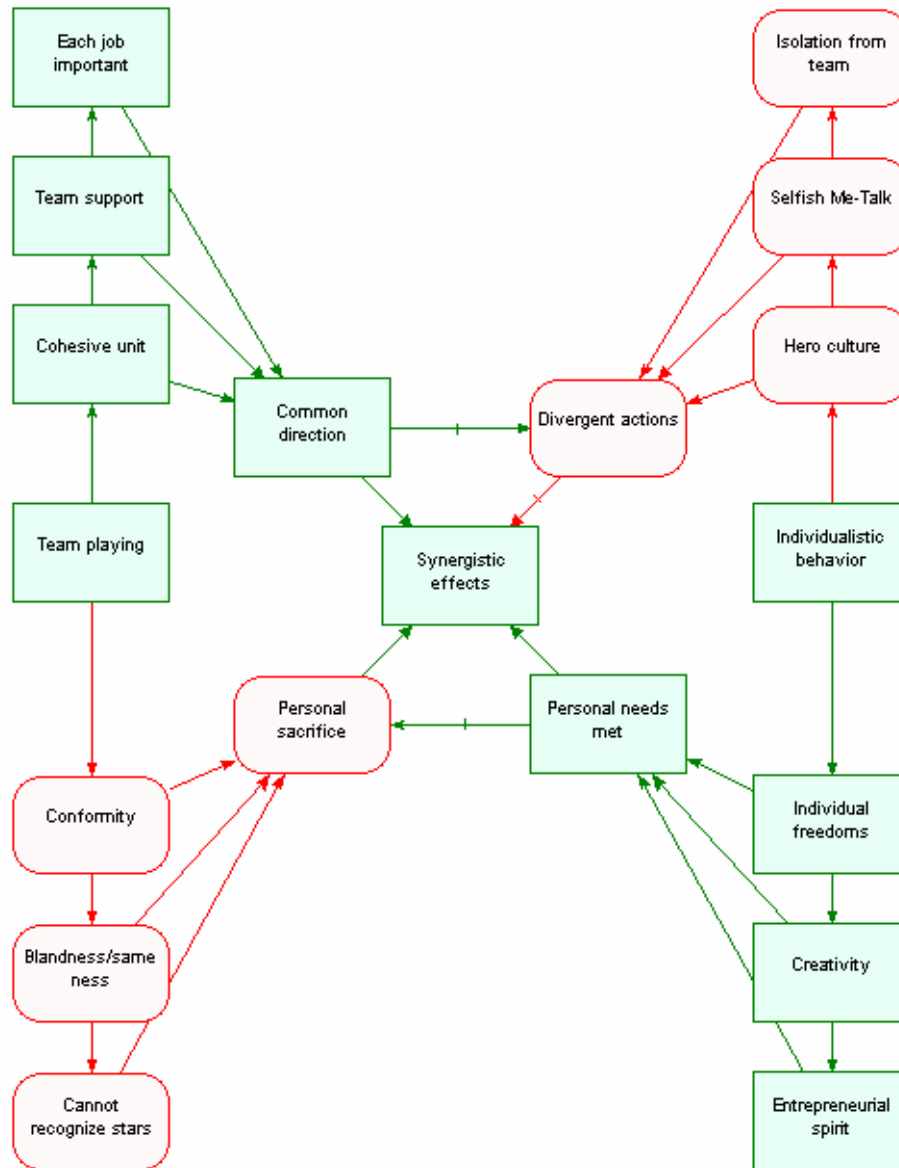


Figure 11 – The integrated model of individual and team play

While there can be many arguments about the precise details of this model, it does ring true. Let's go through it step by step:

At the heart of the model is what Johnson wants, useful "synergistic effects." Surely that's the point of an organization. This is amplified by a "common direction," "personal sacrifice" and "personal needs met," but is weakened by "divergent actions". The divergent actions arise from the "hero culture" that sometimes arises from the necessary individualistic behavior. This provides the necessary creativity and entrepreneurial spirit to allow personal needs to be met. Meeting these needs counteracts the "personal sacrifice" that can arise in team play. On the other hand, the team play provides the cohesion that leads to a common direction. This counteracts any divergent actions. The model is reasonably symmetric. It embodies the key aspects of a polarity. There are two poles in the diagram. The difference is that instead of team playing and

individualistic behavior being seen as negative, they are seen as positive, both necessary for a solution. And each embodies useful and harmful functions which play against the goal of synergy and productivity.

Looking at the model from the point of view of a team, it is now clear what each individual's responsibility is. TRIZ automates the generation of solution directions for both the organization (team play) and individual (creative acts). Here is a subset of the directions in which we must find solutions:

1. Find an alternative way to obtain [the] (Team playing) that offers the following: provides or enhances [the] (Cohesive unit), does not cause [the] (Conformity).
3. Find an alternative way to obtain [the] (Common direction) that offers the following: provides or enhances [the] (Synergistic effects), eliminates, reduces, or prevents [the] (Divergent actions), does not require [the] (Each job important), (Team support) and (Cohesive unit).
9. Find a way to eliminate, reduce, or prevent [the] (Conformity) in order to avoid [the] (Blandness/sameness) and (Personal sacrifice), under the conditions of [the] (Team playing).
12. Find an alternative way to obtain [the] (Individualistic behavior) that offers the following: provides or enhances [the] (Individual freedoms), does not cause [the] (Hero culture).
14. Find an alternative way to obtain [the] (Creativity) that offers the following: provides or enhances [the] (Entrepreneurial spirit) and (Personal needs met), does not require [the] (Individual freedoms).
18. Find a way to eliminate, reduce, or prevent [the] (Divergent actions) under the conditions of [the] (Hero culture), (Selfish Me-Talk) and (Isolation from team).
20. Find a way to protect [the] (Synergistic effects) from the harmful influence of [the] (Divergent actions).

Many organizations have found ways to solve problems like this. The individual-team polarity is not a polarity at all if a solution can be found. Every organization wants high performance teams comprised of creative proactive individuals, so how to avoid the negative aspects of potential hero-culture? One story relates to an IT organization that was particularly prone to hero-culture.

IT shops expect their top programmers to save the day on foundering application development projects. But this is not evidence of a polarity. It shows how immature their software development processes are!

The "IT hero" culture contributes to the failure of projects in the eyes of end users because coding saviours often come late to a project and aren't immersed in the business requirements. To help impose project discipline, IT should use application life-cycle management (ALM) methods and tools. These include project storyboarding techniques designed to better show how data flows through a new application, as well as a refresh of rapid prototyping features. In this way, the "heroes" can see their role in the project. The solution is to provide context for the individual's behavior in the team. The solution addresses the core of Johnson's concern: the tension between team inspired common directions and individual inspired divergent actions.

The reason that Johnson's polarities are not convincing as descriptions as unsolvable problems is that in all of the examples the tangle of useful and harmful functions is more complex than the quadrant diagram can capture. The analysis is too simplistic.

As with SWOT charts, Barriers & Aids diagrams and Fishbone Diagrams from Six Sigma, polarity diagrams are too simple to be useful for problem solving.

Conclusion

As rocket designers know all too well, there are very real engineering contradictions inherent within the design of any high powered rocket.

Rocket scientists alleviate and solve the contradictions inherent in rocket flight using a combination of compromise and inventive approaches. Compromise solutions tweak parameters like thrust and weight. Inventive solutions include segmentation of the rocket, taking out parts unnecessary at certain conditions during the flight, putting one system component inside another, pre-arrangement of parts so that they come into action at the most convenient time and discarding (and possibly recovering) elements that have fulfilled their prior action functions. Such approaches are not just relevant in engineering, but also in business process management, organizational design and other management sciences.

Contradictions, paradox, conflicts or polarity should never be an excuse to avoid solving a problem. Rather, they are the signal that a solution exists. So don't go out and tell teams to compromise when faced with reality. Tell them there are solutions, if only they care to look.