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SILO MENTALITIES, DOMINANT LOGICS AND THEIR ETHICAL CHALLENGES IN THE DEFENSE INDUSTRY

[and in all organizations]

Patricia H. Werhane

Professor Emerita, University of Virginia and DePaul University

INTRODUCTION

In this paper I shall analyze two ongoing ethical issues that pop up in many organizations: the phenomena of silo mentalities and the pervasiveness of organizational dominant logics. I shall focus on these phenomena only on the defense industry, but they occur in every type of organization.   Silo mentality is a widely occurring phenomenon wherein a profession, particular division of a company or a company itself is so focused on their priorities or their expertise that they neglect or fail to perceive how those priorities affect or are affected by other professions, divisions in the company or other corporate members of their industry

The term dominant logic defines another kind of phenomenon. According to Prahalad and Bettis, who coined this term, a dominant logic refers to an organizational culture, a set of practices and habits that help frame the organizations goals and modes of operation. (Prahalad and Bettis, 1986) Dominant logics are vital for the coherent functioning of an organization as an organization. However sometimes a dominant logic can become so ingrained that it creates blind spots or hinders change.

These two phenomena, silo mentalities and dominant logics, which, to repeat, are ubiquitous in many organizations, can result in organizational failures. Using the well-documented Challenger and Columbia shuttle explosions as examples, I shall argue that silo mentalities at NASA and its dominant culture played, central roles in these disasters. These cases thus illustrate how these two phenomena, if unnoticed, can create untoward consequences in any organization. I shall conclude with some suggested remedies to this set of ongoing ethical issues.

A SOCIAL CONSTRUCTIVIST PERSPECTIVE

I shall begin reminding the reader of a commonly held presupposition. It is acknowledgement that our minds are not merely absorbing mirrors of experiential data. Rather, human beings deal with and interpret their experiences through cognitive frames, mind sets, or mental models, following Senge (1992). These models represent intuitive and unconscious methods of sense-making (Weick, 1995). Our minds continually interact with others as well as with the data of our experiences (most if not all of which are shared), selectively filtering and framing that data though various social learning processes. In the process of focusing, framing, organizing, ordering, and discussing what we experience, we mentally bracket or simply omit data simply because we cannot observe or absorb all that we encounter through perception. Each mental model or set of models is finite. because no one has the capacity to take in all of the data of one's experiences; to the contrary, we selectively focus on some aspects and necessarily must ignore others. These cognitive framing exercises, then, can and often do ignore important data. (Werhane, 1999)

In philosophy of science it is now generally understood that scientific methodologies are themselves mental models through which scientists discover, predict, and hypothesize about what they then call reality. Social construction theory takes this idea one step farther with the claim that our shared mental models or schemes frame *all* of our experiences in the sense that they guide the ways in which we recognize and organize what we then call the world. From this claim it follows that the categories that we apply to reality are socially structured. (Gorman, 1992) Indeed, according to social constructionism, this is the only way in which human beings can understand *anything.* Notice this is not the claim that our minds construct reality or what we call experience or the data of experiences. Rather it is the contention that the incomplete and disparate ways in which we present and distill experiences are socially constructed, and thus finite. As a result, because we cannot take in nor frame all the data of our experiences, in sorting out we often leave out important data or ignore data that does not fit into our expectations or habits. This phenomenon, called "bounded awareness," is unavoidable and common, but it can create what Moberg, Bazerman and Tenbrunsel have called "blind spots," where we miss or ignore essential data. (Moberg, 2006; Bazerman and Tenbrunsel, 2011)

Often, too, we create habits that are reinforced either internally or externally through social interactions. In new situations these habits can reinforce choices and behavior that do not take into account bizarre or new situations as just that—new, and we often tend to interpret these situations through our habits. Thus "the most serious problem …is not that we frame experiences, it is not that these mental models are incomplete, sometimes biased, and surely parochial. The larger problem is that most of us either individually or in organizations do not realize that we *are* framing, disregarding data, ignoring counterevidence, or not taking into account other points of view." (Werhane, 2007, 404)

SILO MENTALITIES AND DOMINANT LOGICS

At least one dictionary defines silo mentality as "an attitude within an organization when the different sections or departments do not share information properly because they do not want to share success with others, with the result that the organization is not efficient." (Macmillan Dictionary, 2015)(Another depicts it as "a mind-set present in some companies when certain departments or sectors do not wish to share information with others in the same company. This type of mentality will reduce the efficiency of the overall operation, reduce morale, and may contribute to the demise of a productive company culture." (Business dictionary, 2015) (www.businessdictionary.com/definition/silo-mentality.html)

In this context I am defining this term not as an attitude or deliberate mind set but as a phenomenon that can arise from various causes, the result of which the insufficient or lack of information sharing. This may or may not be because of worrying about success or failure. Rather silo mentalities can exist as outcomes of ingrown habits or a narrow interpretation of organizational roles. An engineer might see herself as a scientist, not as a decision-making while manager might not fully appreciate the importance of negative data when other counterevidence was positive. Or silo mentalities can arise in an organizational structure that does not encourage dissent or cross-communications. This phenomenon is also sometimes described as tunnel vision or tribalism. All of these phenomena can create a framing of expertise or organizational habits that focus on one area of expertise or model and ignore or do not take into account other areas that are pertinent to that organization and its decision-making.

In the defense industry where there is a great deal of collaborative work between companies to complete a finished product, focusing only within one's silo can have dangerous consequences. In both the Challenger and the Columbia explosions, in brief, and for different reasons we shall outline in the next sections, not all of NASA's subcontractors communicated properly with each other and with NASA as to the risks entailed in their contributions to the constructing and evaluating the structure of the shuttle in question. And within NASA itself, very simply put, it appears that many engineers and managers seemed each to have had different perceptions of the risks involved on those launches, and neither (and there were others) understood the mindsets (and thus the risk analyses) of the other.

Dominant logic refers to the most prominent or overriding "logic" or mind set by which an organization operates, its customs, culture, habits of decision-making and even organizational charts. But, as Prahalad and others have pointed out, a dominant logic can create blind spots constantly reinforced sets of habits that preclude creative thinking and adaptability to change in a changing economy. Worse, Prahalad and Bettis maintain, "…the more successful organizations have been, the more difficult unlearning becomes." (1986: 498) Firms' successes fortify their theories of action and makes revisions significantly more difficult (Argyris and Schön, 1978; Starbuck and Hedberg, 1977). "…[T]he longer a dominant logic has been in place, the more difficult it is likely to be to unlearn" (Bettis and Prahalad, 1995: 11).

According to both the Challenger and Columbia government reports, because of its many successful launches, the culture at NASA was rooted in a basic conviction that they were invincible, despite these 2 horrendous accidents. Moreover, at NASA, there was a well-documented logic of strict hierarchy. Engineers assumed that managers were in charge of decision-making. Raising issues or questioning a decision was not encouraged and genuine exchanges of ideas and suggestions were not part of the practice at NASA A third characteristic of this culture, and this was part of the invincibility mind set was the belief that if something worked, and worked repeatedly, it should not be tampered with. This conviction, the normalization of risks, which the *Columbia Report* called the "normalization of deviance" (196) or cognitive dissonance, precluded raising questions about early o-ring failures preceding the

Challenger explosion, and the repeated loss of tiles on almost every flight, including Challenger, preceding Columbia's disaster.

Let us consider these two classic examples: the well-documented Challenger and Columbia shuttle explosions in more detail as illustrating silo mentalities and unexamined dominant logics.

THE CHALLENGER DISASTER, 1986

The details of the 1986 Challenger space shuttle explosion are well-known. The causes of this explosion are complex, and those involved were intelligent, well-meaning, and cared deeply about the success of the shuttle program. And that highlights the problem in both examples: this was not a matter of evil that could easily be targeted and the culprits removed. There were no culprits.

As it is reported by the *Rogers Commission Report* there were a number of contributing elements, which together, caused the explosion. The most famous is the failure the shuttle's o-rings to properly seal due to the frigid conditions on the day of the launch. But as early as the 6^{th} shuttle launch there had been o-ring problems, documented problems reported by engineers such as most famously, Roger Boisjoly. But his memos citing the possible risks to o-ring failure were by and large ignored and by the 25^{th} launch o-ring weaknesses were considered "normal." On the evening before the Challenger launch, a group of engineers objected to the launch scheduled for the next day because of predicted bad weather making the rescue of the module problematic, and because the o-rings had never been tested at cold temperatures predicted for that day. The engineer mentality is ordinarily to worry about safety first. Their mind set usually based on the idea that if a mechanism cannot be proved to be safe, then one assumes it is not until there are more adequate positive indicators. But at the prelaunch meeting the manager of the project, Jerry Mason, now famously told the head engineer, Roger Lund to "take off your engineering hat and put on your management hat."(*Rogers Commission Report*, 1986) The management thinking was that if the engineers could not prove that the o-rings would not work well under cold conditions, one would assume the launch was safe, a mind set in contrast to engineering. The conflicts between a managerial and an engineering mind set where each is operating from his or her role-based silo are obvious, but worse, neither understood that these were mind sets, points of view that deserved to be challenged and were not. The engineers thought of themselves as scientists, which they are, but succumbed to managerial decisions that went against their best judgment, because they accepted that authority and the managerial roles as decision-makers even when those decisions were thought to be flawed. The engineers were in their scientific silos, managers in theirs, and neither imagined questioning those roles.

A second illustration of silo mentality is the various perceptions of risk. According to the physicist Richard Feynman, a member of the Rogers Commission team, estimates of the probably of failure varied considerably. On the launch pad ,and at NASA the perception of the probably of an explosion was as little as 1 in 100,000 while engineers estimated the risk as high as 1 in 10. Yet again, each operated on his or her own calculations or the available data and did not think to consult others (Feynman, 1989)

One of the important contractors for the Challenger was Morton Thiokol and at that company in 1986 there was a policy that anyone within the organization could “blow the whistle” to the CEO at any time. But the engineers on this project did not step out of their assigned roles as scientists to do so. Whether that would have made a difference in the decision to launch remains unknown. But the fact that no one in the NASA organization thought to do so is disturbing.

Coupled with the silo mentalities at NASA was a dominant logic, a logic or ingrained belief that managerial decisions were not to be questioned and the siloed lack of communication and openness reinforced that. NASA had had so many successes and so few accidents, there is wide-spread belief both among managers and engineers that NASA was and could continue to be virtually error-free. That dominant logic at NASA creates an organizational silo that gets in the way of carefully considering the business of NASA (human space travel), the complexities of constructing space shuttles, the myriad of contractors (and thus possibilities of errors) involved, and thus the inherent risks of each shuttle launch, orbit, and landing. (*Rogers Commission Report,* 1986, *Columbia Report, 2003)*

THE COLUMBIA SHUTTLE EXPLOSION

The Challenger explosion was a terrible tragedy and an enormous loss to NASA and the space program. But there were lessons to be learned from that disaster. Unfortunately one could almost do a “search and replace” between the two subsequent reports of these disasters, because of the many parallels between the two explosions and the events that precipitated the explosions, reinforced by an unchanged dominant logic.

The cause of the Columbia explosion was a large piece of insulating from the Thermal Protection System protecting the shuttle, foam that dislodged from the shuttle just after launch. That insulating form struck the left wing of the craft and penetrated its protective seal, thus allowing hot air at the shuttle’s reentry to penetrate the structure and break up the shuttle. (*Columbia Report,* 2003, 9) Insulating foam had dislodged from earlier Columbia missions, indeed according to the Report, “[f]oam loss occurred in over 80 percent of 79 missions which had imaged this loss.” (53) Still, again according to the *Columbia Report* and despite some reporting to the contrary (e.g., see Langewiesche, 2003, p.) “ previous foam losses were in a small area and of little concern. Nor was the foam material defective, having been tested numerous times and in various climatic conditions. Moreover, according to the Report, “Negligence on the part of NASA, Lockheed Martin, or United Space Alliance workers does not appear to have been a factor.” (53) Rather, the dramatic foam loss on this flight was due to a number of factors some of which are still undetermined. However, the *Report* suggests that “a combination of variable and pre-existing factors, such as insufficient testing and analysis [of the foam] in early design stages, resulted in a highly variable and complex foam material, defects induced by an imperfect and variable application, and the results of that imperfect process, as well as severe load, thermal pressure vibration, acoustic, and structural launch and ascent conditions. " (53-54)

But there are other factors contributing to this explosion, factors traced to the organization culture at NASA , factors that had also played significant roles in the previous Challenger explosion. Although NASA allegedly reformed its organizational culture after Challenger, remnants of that remained. In addition to budget constraints the hierarchical culture remained. According Langewiesche, dissenting opinions were discouraged throughout the organization, and as a result engineers saw themselves as merely engineers and managers as those in charge of decision-making. (24) Moreover, after it was discovered that foam debris had hit the left wing during launc,h the head Mission Management, Linda Ham, dismissed it as 'normal,' and refused admit that there might be unique problems with this flight, since foam loss had not created dangers on any of the previous flights. Thus she did not approve a request for more photos of the wing, and no one questioned her authority. (Donovan and Green, 69-76; *Columbia Report*, 2003, 147, 157)

That engineers went along with managerial decisions is not surprising. Numerous studies have documented that inescapable fact that most of us go along with authority or authority figures. (See MIlgram, 1974, Werhane, 2014) As children we learn to obey authority. This is reinforced in hierarchical organizations where decision making is also hierarchical and "from the top." Sometimes then, those in the middle or bottom of the organization imagine that because of their positions, manager decisions are correct or at least, not to be questioned. In other organizations such as the military, or in dictatorships, that assumption is rule-bound. Only in a flattened hierarchical culture where questioning is encouraged and disagreements are part of everyday communication can such habits be changed. NASA's successes have precluded considering such changes in their modes of operation. Moreover, as one of the independent investigators of the explosion Hall Gehman, is quoted as saying, [NASA]is an incestuous hierarchical system with invisible rankings and a very strict informal chain of command… [You hear, 'Well, I was afraid to speak up…If I had spoken up, it would have been at the cost of my job.' And if you're in the engineering department, you're a nobody." (Langewiesche, 2003,76)

Part of this may be due to "normalized deviance," habits that built up because previous launches of the Columbia had experienced foam tile losses and damage on every shuttle launch. to every shuttle. But there were no fatalities, it became assumed that this phenomenon was "normal" or "acceptable risk," without imagining what would happen if a foam tile went astray and penetrated the shuttle. (*Columbia Report* 121) (This is similar to the Challenger normalizing o-ring deterioration which occurred as early as the sixth flight of the Challenger shuttle.). Moreover, there was a widespread dominant logic at NASA that the shuttle was an operational vehicle, while in fact the whole shuttle program and these vehicles are experimental. This belief led to flawed risk analysis of the inherent dangers of each launch and flight. (*Columbia Report*, 2003, 196)

Part of the neglect of this foam debris problem in this flight was due to the lingering mindset of invincibility. Despite the Challenger explosion, since 1986 there had been 87 successful shuttle flights over the 15 year period between that explosion and Columbia. (*Repor*t, 2003, 101) No wonder NASA developed extraordinary confidence in their invincibility in shuttle flights!

As the Chair of the Debris Assessment Team and himself an engineer, Rocha wrote in an email he shared with other engineers but did not send, "…this is the wrong (and bordering on irresponsible) answer from the SSP [Space Station Program] and Orbiter not to request additional imaging help from an outside source. …[S]evere enough damage ..combined with the heating and resulting damage to the underlying structure at the most critical locations…could present potentially grave hazards. The engineering team will admit it might not achieve definitive high confidence answers without additional images, but without …clarify[ing[the damage visually, we will guarantee it will not…" (Report, 157)

There are at least two interesting pieces of information from this unsent memo. First, it was not sent; was that a fear of questioning Ham's authority? According to Rocha, there was. (Report, 2003, 157) [1]Secondly , as in the case of the prelaunch discussion of the Challenger, there was a mindset disconnect between engineers and managers at NAS. As an engineer ,Rocha needed proof that the shuttle was not in danger, evidence that might have been seen through careful imaging of the shuttle's wing. That is a mindset that if you cannot prove a shuttle is safe, one assumes it is not until there is confirming evidence of safety. On the other hand, Ham, like the managers of the Challenger launch, assumed that because previous shuttles had not exploded despite foam debris, this one would not as well. Thus each was functioning within his or her silo of expertise or training, and each was unwilling or afraid to challenge their own mind sets and the thinking of others. Moreover, the hierarchical structure at NASA was not welcoming to dissent, and engineers imagined that their place was to do the science and not make or question decisions of managers. So while the stray foam was the physical cause of the explosion, the organizational culture at NASA precluded taking evidence and safety measures while the shuttle was in orbit that might have prevented that explosion.

The real tragedy is not remembering the organizational as well as physical causes of the previous explosion, a cultural amnesia that could reoccur again.

SOME POSSIBLE REMEDIES

The existence of silo mentalities and flawed dominant logics are evident in individuals, in organizations such as NASA, in corporations, and in our culture. They are outcomes of the ways

[1] "When asked why he did not send this e-mail, Rocha replied that he did not want to jump the chain of command. Having already raised the need to have the Orbiter imaged with Shack [a NASA manager], he would defer to management's judgment on obtaining imagery." *(Report*, 157).

in which individuals and organizations socially construct their experiences. And as one commentator noted, "[i]nstitutional logics, once they become dominant, affect the decisions of organizations…by focusing the attention of executives toward the set of issues and solutions that are consistent with the dominant logic and away from those issues and solutions that are not." (Thornton, 2004: 12-13). At NASA the hierarchical structure and lack of communication between engineers and managers reinforced silos of flawed decision-making. And the dominant logic, the pervasive mentality of NASA which the *Columbia Report* describes as "NASA appeared to be immersed in a culture of invincibility…" (199) precluded an ongoing consideration of the risks of this experimental vehicle. These organizational weaknesses are evidenced in both the Challenger and Columbia explosions, a pervasive mentality that was not seriously reexamined after the Challenger disaster.

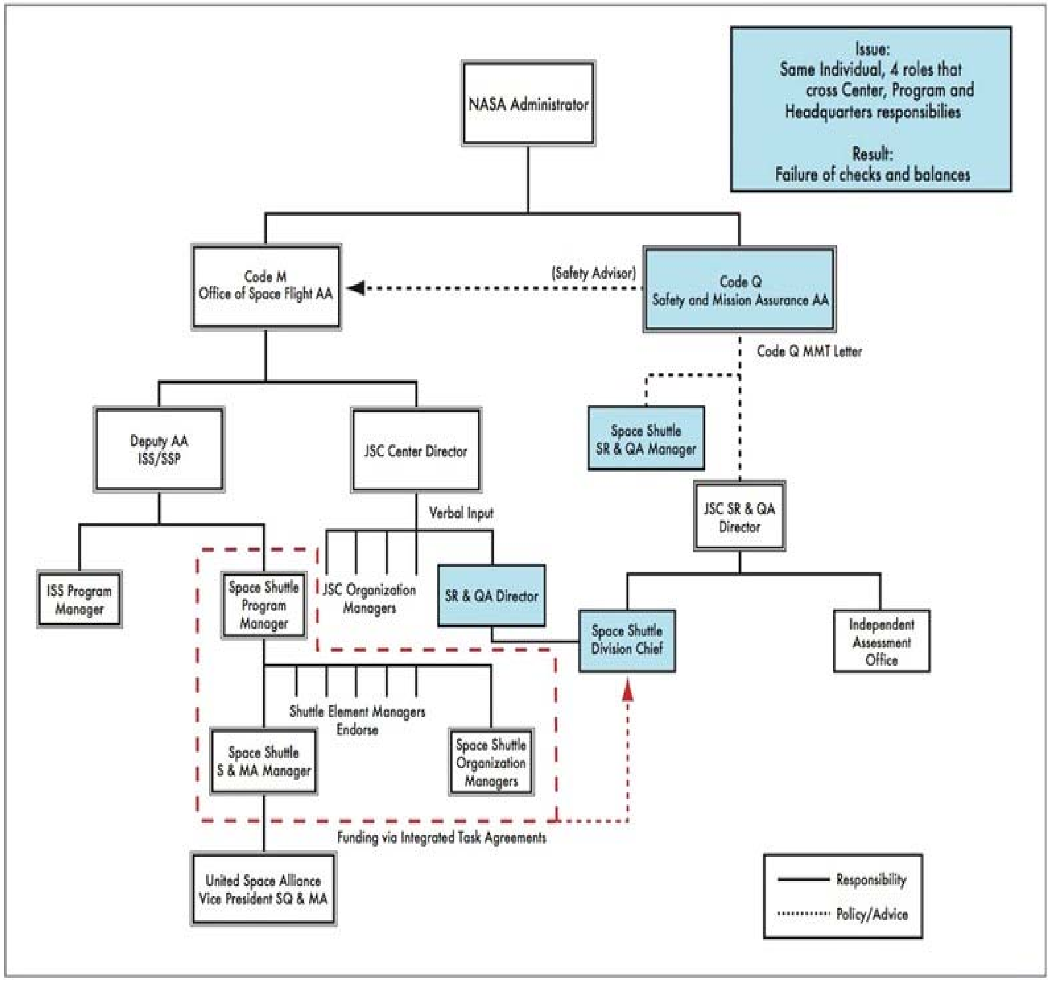
How does one make changes to an organization to avoid some of these problems in the future? Adopting the model of the highly successful Navy Submarine and Reactor Safety Program, the *Columbia Report* proposes a series of recommendations for NASA. First and foremost, NASA must establish communication between all employees: engineers, managers, subcontractors and NASA administration that are open, nonjudgmental, encourage minority opinions, and without fear of hierarchical retaliation. These seem to be obvious suggestions but they are exactly what did not go on at NASA previously.

Secondly, training, which is obvious, but more importantly learning from the mistakes of Challenger and Columbia. I would suggest that this is best done through using the extensive Challenger and Columbia reports as case examples to illustrate what can go wrong despite the good intentions of all those involved. This sort of training should be carried out in a cross-disciplinary way, bringing in engineers , managers, subcontractors and NASA administrators together, not in separate training sessions. The latter would simply reinforce the pervading siloed culture. Using these disasters as learning experiences (rather than pointing fingers at particular managers) can also be effective in retaining knowledge at NASA . Somehow after 87 successful flights, the Challenger issues were forgotten and the continuing repeated occurrences of foam debris were dismissed as normal.

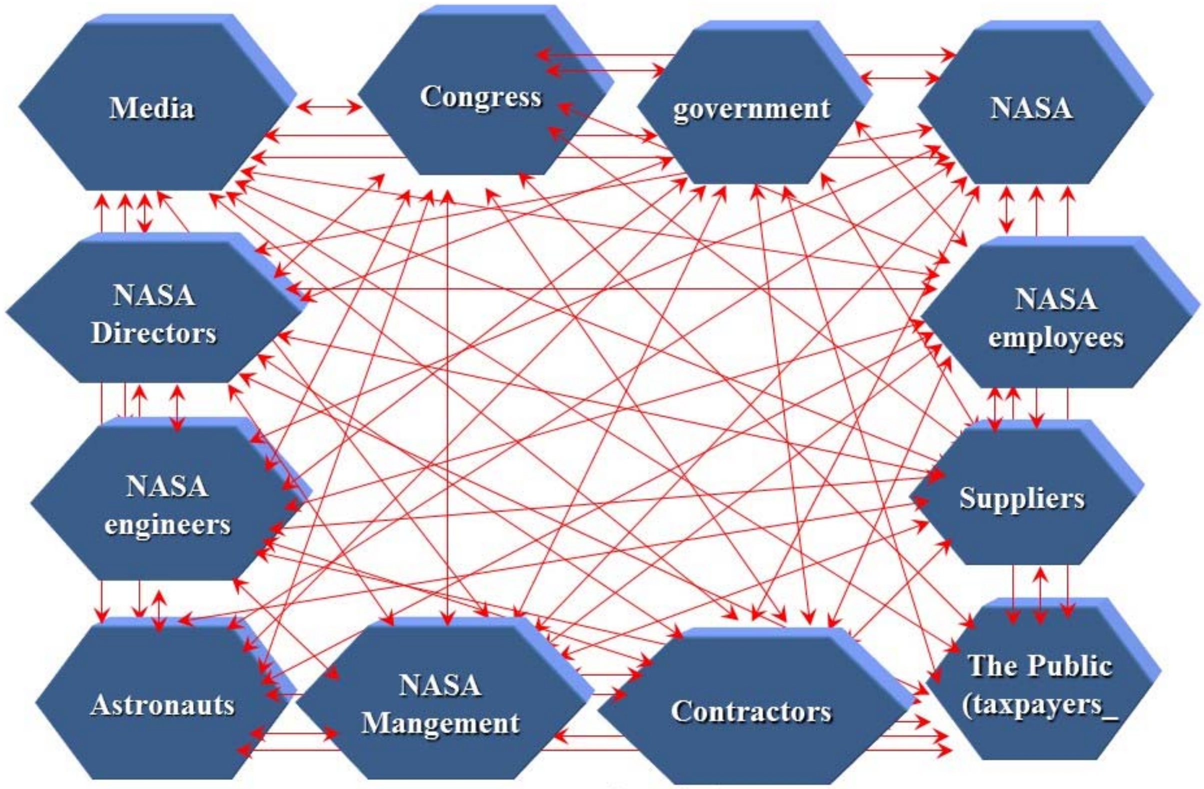
Third, part of this training should be in risk analysis including simulating worst-case scenarios that have not yet occurred. Such scenarios, the Navy discovered, reinforce the dangerous and experimental nature of their program, and reinvigorates risk analyses that are closer to that reality rather than merely the risks of every-day operational vehicles. Such analyses also strengthen the importance of safety as the primary consideration, a consideration that the Report found of secondary importance at NASA—"a broken safety culture…of blind spots." (*Columbia Report*, 184) created by the many successful launches and the managerial conviction that the past will always predict the future. (182-4)

All of these are important recommendations not merely for NASA but for any organization. I would emphasize and elaborate upon two aspects. Returning to the assumption with which I began this paper, despite that fact that all our experiences are socially constructed, because they are incomplete representations or reconstructions of the data of our experiences, one can step back from those constructions, reexamine a dominant mind set logic, and revise or change it. As human beings we do that all the time, and organizations do as well. To break out of a silo, to realize that one is in an organizational role that is merely that and overlaps with other functions of the organization, is important for employee development and to create instigators of change. To revise an organizational dominant logic individuals in that organization, usually its leaders, and the organization itself have to realize that these silos exist and that the dominant logic of the organization may be contributing to failure. Moreover, they have to experiment with new logics and be unafraid to change what seems to be "cemented" in place. Elsewhere I have call this the development of moral imagination coupled with courage to change. (Werhane, 1999) This is the most difficult thing to achieve in any organization. We are all creatures of habit and when operations seem to be going well, we loathe to change. NASA's successes are terrific and one would not want to interfere with the elements of that organization that has produced so many successful shuttle launches. However, every launch had problems, problems that were not addressed as life-threatening. Going back again and again to these successful but flawed launches and simulating worst-case scenarios could be very effective in changing NASA's culture. More importantly, a realization that there were many "near misses" in every flight that need not have happened, and that organizational mind sets contributed to those near misses (All documented in the two Reports) might help NASA to rethink itself.

Finally, and this is only hinted at in the Report, probably because it seems obvious, the shuttle program is a massive systemic creation from a vast number of inputs from contractors, subcontractors, engineers, managers, suppliers, astronauts, government, etc. So what is required is a systems analysis of the program and of the design and launch of each shuttle. But it also requires rethinking the hierarchical structure or the organization. Figure 1 is one image of the organizational chart at NASA with arrows pointing to proposals for cross-sectional communication. But another way to encourage systems thinking is a graphic such as Figure 2 , undetailed but demonstrative of the complex interrelationships (and this is simplified) at NASA . Figure 3 places the shuttle program in the center to emphasize that that is what all of this is about. There are simple graphics but they have been effective in other organizations. For example, Novo Nordisk's graphic of their organization (see Figure 4) places people with diabetes in the center, to emphasize that they are in the business of ameliorating disease and that that, rather than the existence of the organization itself is of primary importance. These are simple graphics but in the age of visual rather than written thinking, they can be effective in revamping an organizational focus.



Columbia Accident Report, 2003, p. 185


Media
Congress
government
NASA
NASA Directors
NASA employees
NASA engineers
Suppliers
Astronauts
NASA Mangement
Contractors
The Public (taxpayers_

A Stakeholder Map

c 2015 Patricia H. Werhane

Repositioned stakeholder maps

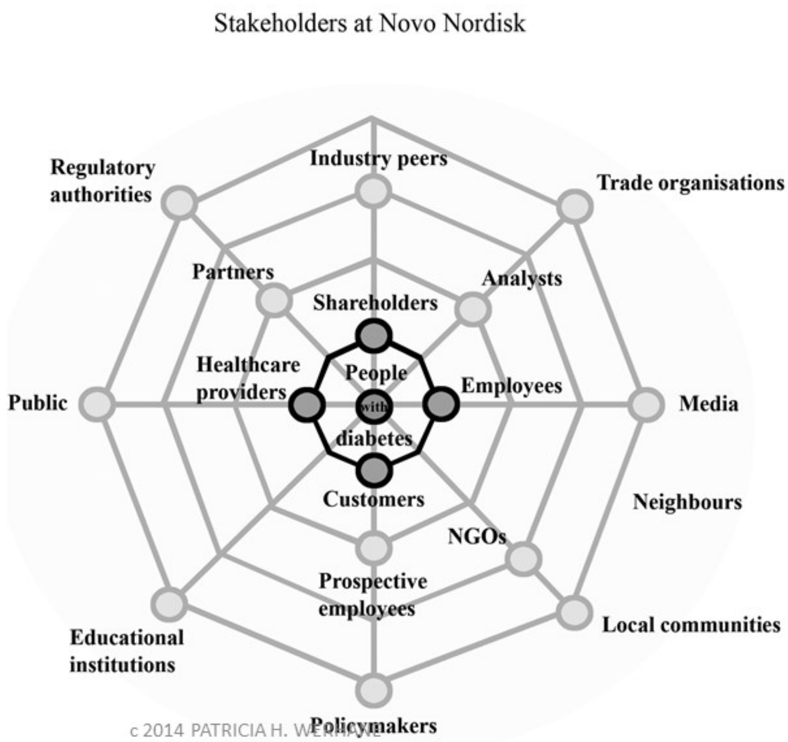


Figure 4

CONCLUSION

There are no simple solutions to discouraging silo mentalities or examining, evaluating, and revising ubiquitous dominant logics. Our schooling is, by and large, siloed. Managers don't learn much about engineering and engineers are not always good managers. Organizations can only function if there are some uniform practices in place. Yet each of these has its limitations, and being cognizant of those limitations and reexamining the mindsets that dominate an organization from time to time is essential to avoid disasters such as the two shuttle explosions. There is literature that argues that it takes a defining event (such as a shuttle explosion) to trigger these sorts of reexaminations. Isabella, Prahalad and Bettis observe that changing a dominant logic requires a precipitating crisis. "In general it appears…that changes in the ways organizations solve significant new problems (i.e. change dominant logics) are triggered by substantial problems or crises" (Isabella, 1992; Prahalad and Bettis, 1986: 498). Another researcher notes, "Organizational unlearning [a precursor to developing a new dominant logic] is typically problem-triggered….These triggers cause hesitancy and build up distrust in procedures and leaders. A turbulent period then frequently follows" (Hedberg, 1981: 19). But (a) that does not always work, particularly in an organization with a strong ingrained culture and habits such as NASA, which experienced a triggering event: the Challenger explosion. And (b) some organizations are able to evaluate ore reexamine their cultures and themselves without such an upheaval. In any case, the process of stepping back, which as conscientious or conscience-driven individuals we engage in all the time, and challenging operating procedures, ingrained habits, and decision processes is possible in organizations, all organizations, as well. This sort of thinking entails moral imagination and moral courage, it is risky since as we saw at NASA much of what they do is invaluable to the future of the space program and the various scientific experiments they engage in. Yet that set of exercises is vital to the future success of a very complex and worthwhile organization.

REFERENCES

Bazerman, M. and Tenbrunsel, A. 2011. *Blind Spots.* Princeton: Princeton University Press.

Business dictionary, 2015, www.businessdictionary.com/definition/silo-mentality.html. Accessed March 3, 2015.

Columbia Accident Investigation Board Report, (Columbia Report), Volume 1, 2003. Washington D.CL: National Aeronautics and Space Administration and the Government Printing Office.

Donovan, Aine, and Ronald M. Green. 2003. "CASE STUDY: Setup for Failure: The Columbia Disaster." *Teaching Ethics* 4.1: 69-76.

Feynman, Richard. 1989. *What Do You Care What Other People Think.* New York: W.W. Norton.

Gorman, Michael. 1992. *Simulating Science.* Bloomington IN: Indiana University Press.

Hedberg, B. 1981. "How Organizations Learn and Unlearn." In P.C. Nystrom and W.H. Starbuck (eds.), *Handbook of Organizational Design Vol 1, Adapting Organizations to their Environments*. Oxford: Oxford University Press. 3-27.

Isabella, L.A. 1992. "Managing the Challenge of Trigger Events: The Mindsets Governing Adaptation to Change." *Business Horizons.* September-October: 59-66.

Langewiesche, William. 2003. "Columbia's Last Flight." *Atlantic.* 292: 58-82.

Macmillan Dictionary. 2015. www.macmillandictionary.com/open-dictionary/entries/silo-mentality. Accessed March 5, 2015.

Milgram, Stanley. 1974. *Obedience to Authority.* New York: Harper and Row.

Moberg, Dennis. 2000. "Ethical Blind Spots in Organizations." *Organizational Studies* 27: 413-28.

Prahalad, C.K. 2004. "The Blinders of Dominant Logic." *Long Range Planning.* 37(2): 171-9.

Prahalad, C.K., and Bettis, R.A. 1986. "The dominant Logic: A New Linkage Between Diversity and Performance." *Strategic Management Journal.* 7: 485-501.

Report of the Presidential Commission on the Space Shuttle Challenger Accident, (*Rogers Commission Report"* Volume 1. 1986. Washington D.CL: National Aeronautics and Space Administration and the Government Printing Office.

Senge, Peter. 1990. *The Fifth Discipline*. New York: Doubleday.

Thornton, P.H. 2004. *Markets from Culture*. Stanford, CA: Stanford University Press.

Weick, K., Sutcliffe, K., and Obsfeld, D. 1995. *Sensemaking in Organizations.* Thousand Oaks CA: Sage Publications.

Werhane, Patricia H. 1999. *Moral Imagination and Management Decision-Making.* New York: Oxford University Press.

_______________.2007. "A Place for Philosophers in Applied Ethics…" *Business Ethics Quarterly*. 16.401-8,

_______________.Hartman, L. P. Archer, C., Englehardt, E. and Pritchard, M. 2014. *Obstacles to Ethical Decision-Making.* New York: Cambridge University Press.