7 The limits of reflexive design in a secrecy-based organization

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Organizational redesign processes can take many forms from the simple implementation of an 'off-the-peg' standard solution to a 'carefully tailored' solution characterized by many iterations of experimentation, evaluation and collective reflection by various stakeholders. Two key contextual factors affecting such processes are culture and decision-making authority. These variables are complex in themselves and their influence on the redesign process can be moderated by specific factors. This chapter presents a case which illustrates how efforts to accommodate collective reflection within an organizational redesign program were affected by organizational culture and centralized decision-making and how these effects were heightened by a 'secrecy factor'.

One of the most promising topics to explore in contemporary knowledge-based organizations concerns productive reflection and learning that takes place during significant organization restructuring. Reflexive design incorporates aspects of action research, appreciative inquiry, socio-technical systems and self-design. It provides unique insights concerning the redesign process and the management of system wide change (Stebbins and Shani 2002). However, the extent to which reflexive design might be applied under extreme organizational conditions is unknown. This chapter investigates the limits of productive reflection and learning under conditions of secrecy. We will provide a brief overview of ideal reflexive design and then demonstrate significant gaps between theory and practice through the examination of the PrimeOptics case. Finally, we will provide observations about the case and implications for productive reflection in similar organizations.

Organization design

Relatively few theories provide comprehensive frameworks that can shed light on the chaotic process of redesign (Beer 2001). *Design* is thought to be a blend of theory, knowledge embedded in the particular industry/sector and work situation and the contributions of those who participate in the redesign process (Mackenzie 1986). The process is both technical and political, and involves purposeful effort to design the organization as an integrated system. Moreover, design is treated as a complex task that aligns the people, resources and work. In today's environment,

the list of participants in redesign projects may include all key stakeholders, owners, personnel, customers and suppliers. However little is known about the impact of including or excluding specific stakeholders. For example how does the exclusion of non-managerial employees affect redesign outcomes? Will the new design be less sustainable? In complex organizations, elaborate structural learning mechanisms are often created to guide the change program and to foster sound communications, reflection and learning during all program phases (see for example, Chapter 9). In contrast, what are the helpful processes, and what are the outcomes of redesigning work when it is conducted by a few people having similar backgrounds, making decisions in secret? What are the appropriate types of involvement, dialogue and reflection, under conditions of secrecy in the change process?

Reflexive design, reflection and learning

Certain common values have emerged regarding idealized reflexive design. These values relate to the context for initiating change, the change process and the desired outcomes. For example, a strong value is dual emphasis on quality of work life and competitive organizational performance. Both are addressed throughout the change process through critical evaluation of new designs and their impacts on different stakeholders. Design is conceived as *a reflexive methodology of intervention – a type of enlightened, self-critical process that accepts differences in science and practice.* By definition, reflexive design means to mirror or direct back the redesign work. Since the dictionary definitions are so similar, in this chapter we will freely use the words reflective and reflexive. Collective reflection *is the ability to uncover and make explicit what was planned, observed, or achieved in practice; therefore it is concerned with the reconstruction of meaning and results in work-based learning* (Raelin 2000). In the context of a change program, some new types of reflection and learning are evident. They might include:

- Participants explore vision and goals as well as alternative redesign frameworks. The stakeholders investigate and choose among redesign approaches that fit their unique situation (see Figure 7.1).
- Participants' self-apply theory, methods and practices. In keeping with self-design values, organizational members take ownership of the change process through high involvement at all stages. In a spirit of inquiry, all parties including consultants consider both theory and practice, and deliberate on ways to link them.
- Participants are encouraged to identify and explore the meanings and implications of possible dilemmas – for example that team-centred designs might suppress individual creativity.
- Design activities are iterative. Deliberations among stakeholders occur throughout the process to assure that redesign produces the desired balanced outcomes. Self-design and learning from experience are facilitated (Figure 7.1).

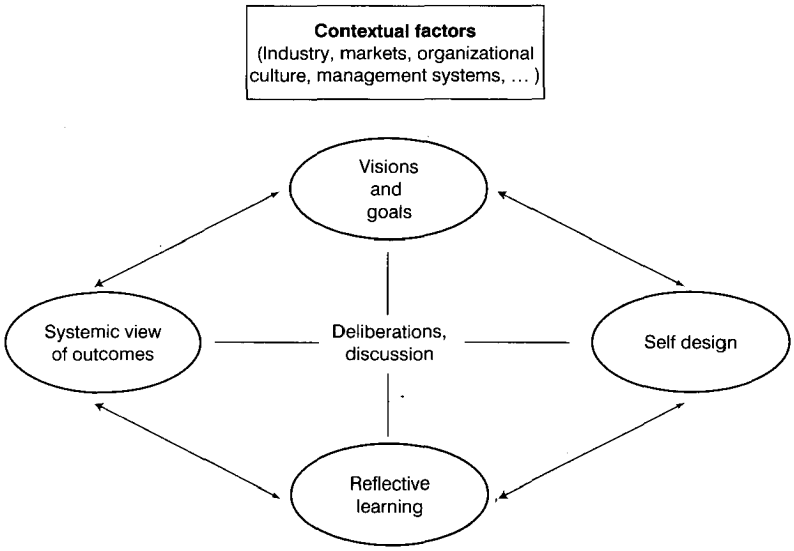

Figure 7.1 Reflective design: a conceptual roadmap

Secrecy as an impropitious culture and context for collective reflection

As is illustrated in Chapters 8 and 9 in this volume, the constraints on redesign and learning can stem from the existing management, culture and organizational configuration. For example, organization theory suggests that a matrix organization carries a certain culture of openness, ongoing clash of perspectives, full use of knowledge worker talents and problem-solving on behalf of customers (Galbraith 1994). However, a defense industry firm with a matrix structure may not have these characteristics (Landau 2003). Instead, secrecy and competitive pressures across defense contractors may lead the firm to adopt unique internal processes that do not encourage workplace learning and knowledge transfer beyond somewhat isolated work units (cf. Schenkel, Chapter 6 in this volume).

Secrecy is a contextual variable as well as a cultural variable. Organizational culture is usually defined in terms of persistent shared values and behavioural norms (e.g., Mitroff and Kilmann 1984). Aspects of the culture (e.g. secrecy, in terms of doing business on a 'need-to-know' basis) are likely to conflict with principles of ideal reflexive design. We need to explore how learning in general and productive reflection in particular are advanced under a culture that emphasizes secrecy.

Vision, goals and criteria

Reflexive design theory advocates local control of design processes and high participant involvement in the creation of goals and design criteria. Thus this approach is more of a bottom-up approach to change. The question of how goals

and design criteria are developed during redesign programs is an interesting issue, especially under conditions of secrecy. *Design criteria* are statements that describe, in ideal terms, what the organization design should accomplish. Design criteria usually have an action verb; they state that the design should *facilitate, promote, encourage, provide for, or motivate* (Nadler and Tushman 1988). Design criteria reflect the values of the different stakeholders and are written in response to competitive conditions, the tasks to be executed, the collective sense of current problems and perceived cause of problems, and other constraints. Design criteria drive the entire decision-making process and provide links to strategy, technology integration and the development process that occurs in design cycles. The advantages and limits of design criteria are explored in the case to follow.

Collaborative design

The design process must consider individual and team capacity to cope with a changing work. One of the most compelling aspects of reflexive design is the emphasis on personal support to employees and learning. Successful redesign work requires the active involvement of those who must live with the changes as well as social support mechanisms (Shani and Docherty 2003). During operational redesign, individual experimentation takes place within the context of group work and inter-group relationships. Accordingly, reflexive design can be characterized as 'collaborative design', entailing collaboration among members of the units directly concerned and also among concerned stakeholders.

Collective reflection

Reflexive design processes must provide space and time for learning and developing competence in work. This includes providing forums for structured deliberation within the normal project stages as well as time for spontaneous and unplanned learning and reflection. The process of change centres on the knowledge and experience of those who are closest to the work at hand. Learning, coping capacity and other individual competencies support people as they experiment with new roles, relationships and work activities (Raelin 2000). Successful transformation depends upon effort, individual capabilities and sound facilitation of the overall reflexive design process. The above characteristics are associated with the ideal process of reflexive design. The redesign process led by managers of PrimeOptics is captured next. It is used here to highlight aspects of *good reflexive design* as well as *major flaws* that do not promote productive reflection and learning.

The PrimeOptics case

PrimeOptics is a division of one of the largest defense and aerospace systems contractors in the United States. With billions of dollars in annual sales this defense contractor employs many thousands of employees worldwide. The company is known for its high standards of technological innovation and customer relations,

as well as for its relatively low employee turnover rates. Despite these positive factors, at the outset of the case the PrimeOptics division suffered from declining sales and a lower market share. A customer survey conducted in early 2002 indicated that PrimeOptics was not considered cost-competitive. 'We love your technology; it's needed to save lives; we wish we could afford it' was the typical response from PrimeOptics' customers.

PrimeOptics devoted considerable resources to customer relations and responsiveness. It had strong program management offices for customer interfaces and a full spectrum of engineering personnel assigned to the various programs. Each program was responsible for a family of technologically related products, throughout their life cycles. Due to the secretive nature of the industry, programs were developed for specific customers. Program autonomy and internal company barriers led to non-uniform production and business processes. As a result, the company was often too slow and expensive in moving from prototypes to efficient manufacturing.

To address the perceived threat to the company success and survival, an overall change program was designed, aimed at reducing cycle times, reducing cost of engineering support, improving the transition from product development work to production work, and positioning the company to compete in new markets. To accomplish this, six taskforces were created, one of which is focused here – the Production Execution group. The group's task was to restructure production operations and to significantly reduce manufacturing costs. It was expected that financial and productivity gains would come through a reorganization of engineering support groups and a breaking up of the PrimeOptics matrix organization. The explicit intent was to cut engineering support costs by 50%.

PrimeOptics had an embedded matrix structure (see Figure 7.2), in which the engineering support groups reported to both production and program management. There were certain inefficiencies associated with having dozens of mutually exclusive programs. For example, there were problems connected with allocating engineering staff in periods of peak and low demands. But PrimeOptics had not developed cross-program managerial processes to address these and other issues. The PrimeOptics organization seemed to have all the problems and very few of the benefits normally associated with matrix structures.

Staffing the taskforce

The vision for the change program called for a shift in decision-making authority and control from program offices to the factories. Accordingly, management staffed the production execution taskforce with factory managers and supervisors, and excluded program offices and engineering support personnel. It was very evident from the taskforce staffing that management did not want to save the matrix. While most of the managers on the taskforce were former engineers, only two of the 10 taskforce members had program office or customer contact experience from prior jobs. Due to the organizational culture, participation in the taskforce was secret and few people outside the taskforce knew that it existed or what it was doing.

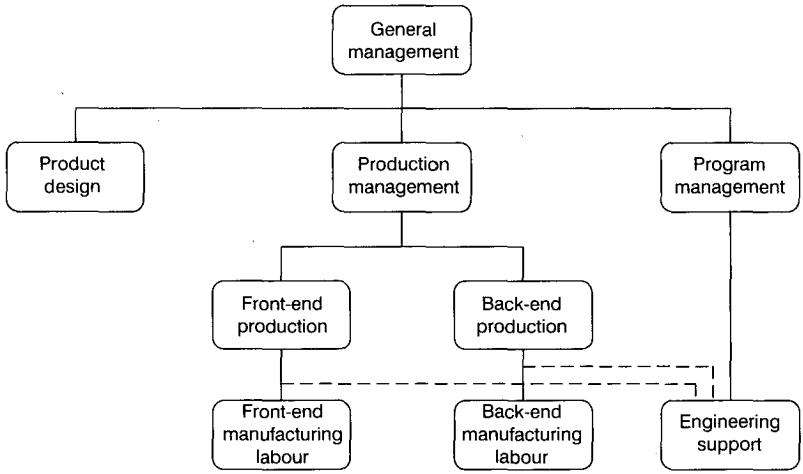

Figure 7.2 Organization chart with embedded matrix structure

Time line

The taskforce was created in February 2002. Since some taskforce members were aware of organization designs in other divisions of the company, they used their contacts to investigate design innovations that might be adapted to the PrimeOptics situation. They identified six manufacturing designs that were thought to be successful elsewhere and seemed to match the vision. They then began to elaborate them and provide definitions that would allow comparisons. The taskforce met biweekly, and conducted data gathering between sessions. Reflecting on this phase of the taskforce work, team members later observed that the pace was almost frantic, even though they worked to a self-imposed deadline. The taskforce proposed a new strategic design in June 2002. However, after this point there were many delays in feedback and directives from management and taskforce members became impatient with the lack of action. The management decision was announced in November, and the cutover to the new design began in January 2003.

The researchers' role

In late March 2002 the taskforce leader brought in a team of two university researchers to assist the taskforce and to provide independent opinions and information on 'state-of-the-art' practice. One researcher was an expert on industrial engineering, and the other was an expert on organization design. The researchers began their work by linking the taskforce deliberations to alternative design theories including reflective design. The idea was to place the taskforce work into a larger perspective so that the group could consider a wider and more robust set of options. For example, the researchers felt that work in progress most closely matched the Nadler and Tushman (1988) redesign process. They guided the group through the

various steps in the Nadler and Tushman process to educate members on comprehensive design and to allow some critique and reflection on what had been accomplished and what had not been accomplished. This type of comparison and discussion among consultants and clients is a key feature of reflective design.

The researchers also helped the group identify issues that would have to be addressed in the coming design and development stages. They provided the platform for the taskforce leaders' reflection about both the design process and substantive issues, and provided their own expert assessment. They also encouraged management to bring in more stakeholders, but this advice was not acted on. Consistent with PrimeOptics culture and values, managers stated that the project was kept secret 'to allow the taskforce maximum freedom in generating alternative designs, and to avoid rumors'. Accordingly, most other PrimeOptics managers, supervisors and employees remained in the dark on the redesign process both before and after recommendations were made.

The organization design process performed by the taskforce

During the period from late March to May, the taskforce developed six alternative organizational designs. The researchers were unable to participate in all the face-to-face discussions due to distance and time limitations. But they were able to bombard the group with questions via phone calls and email messages. Based on the desired future capabilities, the taskforce developed a list of 10 criteria that could be used to evaluate the six options. It is noteworthy that design criteria were created by the taskforce members in relative isolation.

The researchers pointed out that 'people issues' were seldom directly included in construction of criteria. For example, the 'ability of designs to promote career paths' criterion was assigned a 3.4% decision weight. The taskforce norm was to avoid people and emotional considerations in favour of criteria that emphasized costs and technical solutions. The PrimeOptics culture, values and norms stressed engineering objectivity. After the project was completed, several members indicated that this inhibited frank discussion. On reflection, they indicated that structures were being created that would benefit specific members of the taskforce, but that this was deliberately not discussed during meetings. Team members could clearly see their potential new roles in the different options being considered but did not discuss their personal likes and dislikes 'in order to stay objective'.

By the time that the taskforce began deliberations on the best choices, the researchers were again on the scene. Consistent with the original objectives, the group focused on two alternative designs that decentralized engineering and program office activities to the factory, breaking up the matrix. At this critical stage the researchers raised several issues for collective reflection:

- Are the leading alternatives significantly different from each other?
- Would either of the models facilitate the expressed needs of other taskforces?
- How would the models perform under scrutiny of other stakeholders?
- How risky are these models to the company's main strengths – innovation and customer responsiveness?

The taskforce members welcomed these points being raised, but they did not feel that time or additional resources could be spent on questions raised by the researchers. Keeping a self-imposed deadline for presenting their final design seemed more important than following a reflexive design process that might take several more weeks of work. Instead, taskforce members combined the best elements of the two models and submitted one design to top management.

Top management took four months to design their own solution retaining key features of the matrix organization (Figure 7.3). This was surprising to all parties given the initial overwhelming management sentiment against the matrix. The taskforce leader was especially shocked because he had informal contacts with other taskforces and was not at all aware of top management intentions. He felt that the redesign was significant in the sense of new factory authority over certain engineering support groups, but he did not understand why other elements of the proposed design were rejected. The matrix would be retained, with little hope for achieving major cost reductions. Much of the past sense of urgency and crisis faded away. With a return to company profitability, top management expected to make few cuts in staffing.

In January 2003 the taskforce leaders and researchers took stock of the situation. It was apparent that top management had abandoned the vision, values and rationale behind the change program. Taskforce members did not know why the new design was selected or how it might be justified. That is, without the crisis of high support costs and need for downsizing, what would management and the taskforce members communicate to the workforce as the reason behind the significant changes in organization design?

The transition process and dynamics

The researchers, hoping to broaden participation and to foster a spirit of reflection and learning, proposed an elaborate structural learning mechanism. This mechanism would tightly link in human resources, training, information systems and other support services commonly required in the cutover to new designs (see Chapters 8 and 9). However, the newly appointed production executive chose instead a simple implementation group of four sub-team leaders (all managers) and an overall transition team leader. Since some of the newly appointed transition team members had not been involved in the prior process, the group took time to revisit earlier taskforce decisions. With a better understanding of past options considered as well as top management's strategic design, the group began to alter the operational design of the factories. This activity was 'design on the fly'. New work emerged from collective reflection on the current situation and experiences, a feature of reflexive design. The transition group had freedom to redesign work on the shop floor, and selectively began to involve work teams in experimentation with new work methods and production processes. Compared to the prior taskforce the team did not have to worry about approvals as it had authority to put changes in place immediately. The researchers observed that this type of collaboration and involvement with employees had seldom been seen earlier in the change program. As the transition team conducted its work, they encountered some obstacles to

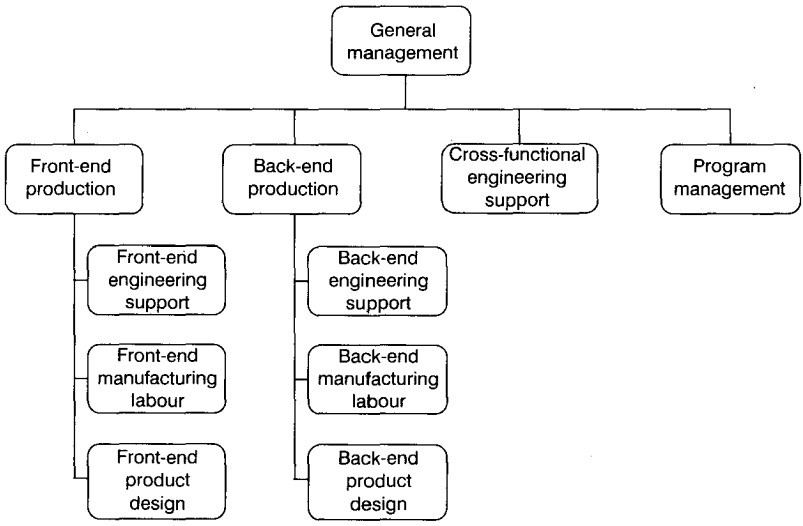

Figure 7.3 New modified matrix following redesign

innovation and efficiency. The transition team felt that the new design could not achieve full potential until dedicated engineering staff members were physically co-located in the factories. However, there simply was not enough space in the factories for engineering staff, and the transition team had to alter this important aspect of the operational design.

Discussion

Reflections on the case and the scope of the redesign process

Reflexive design theory is a useful framework for analysis of the PrimeOptics case. According to theory, the quality of deliberations and discussion at all stages of redesign work is crucial to achievement of balanced results. Moreover, the reflexive design approach calls for high involvement from all parties and self-application of theory, methods and practices. In the PrimeOptics case, important stakeholders were left out from the start. This had serious implications for the construction of the vision and goals, self-design activities, the scope and time for reflective learning, and managerial capacity to adopt a systemic view of outcomes. In the larger change program, learning and reflection were not perceived as important elements in the change process. Leaders and members of the various taskforces did not regularly meet to share progress and discuss problems, and were not aware of potential impacts of their own activities on others. The top manager kept abreast of taskforce activities but missed opportunities for synergy and reflective learning at all management and employee levels. Thus the various taskforces had a restricted view of the internal environment and shifting priorities. This was demonstrated most dramatically by the rejection of the production execution taskforce

recommendations. Top management decided not to cut engineering support costs by 50%, and decided to retain basic elements of the matrix organization. Overall, the decision-making was top-down, except for the generation of taskforce recommendations. Lack of dialogue up and down the hierarchy seriously limited productive reflection, learning and commitment to the strategic design.

At the taskforce level, conditions were much better. Considering our earlier list of new types of reflection and learning (see 'Reflexive design, reflection and learning', p. 81), some aspects of reflexive design were handled quite well. Taskforce participants explored goals, alternative redesign models and developed design criteria. The group clearly adopted an approach in agreement with PrimeOptics' unique culture and situation. Taskforce members were able to self-apply theory, methods and practices and assumed strong ownership of the change process. However, they also set unrealistic deadlines and sacrificed opportunities for collective reflection to meet self-imposed project milestones. Management and the taskforce did not regard design work as iterative, or that it should receive attention beyond the rather 'closed' taskforce membership. The redesign taskforce did not check their work with top management or any other group and thus left themselves open for criticism and the eventual surprise of seeing their suggestion replaced by a new design passed down from top management.

It is noteworthy that the taskforce simply passed on its recommendations, and did not seriously engage in discussions with top management. This continued the group's pattern of avoiding conflict, discussions of differences and consideration of emotional or non-technical issues. In retrospect, taskforce members reflected that a great deal of time was wasted on development of design criteria, quantitative ratings of the alternative designs, and merging the two leading models. These considerations had little to do with the design created by top management. They felt that the time might have been devoted to conversations with the top manager so that the final strategic design could reflect their knowledge of conditions in the factory and how the design might be implemented. Both the PrimeOptics culture and locus of decision making seemed to block meaningful dialogue.

Reflective design processes include time for learning and development of new competencies. This includes deliberations within normal project stages as well as time for spontaneous and unplanned learning and reflection (Stebbins and Shani 2002). This is especially important as redesign shifts toward implementation and people need support experimenting with new roles, relationships and work activities. As noted in the case, management did not see the need to create a transition support infrastructure that would support experimentation, training and learning at operating levels. Implementation was left to a small management team. Production process changes were initiated with selected work teams, and the implementation group modified the strategic design to account for various obstacles and factory realities. These initiatives produced the kinds of collaborative design, productive reflection and learning that researchers hoped to see during the overall program.

Reflexive design authors and consultants promote a systemic view of values-based outcomes. Dual emphasis on quality of work life and competitive organiz-

ational performance is a core value (Docherty *et al.* 2002). PrimeOptics, however, rarely considered the intellectual, emotional or physical needs of employees as it established a vision and goals, conducted self-design activities and implemented the new design. Low involvement of employees, customers and other stakeholders led to myopia, sub-optimization and considerable wasted effort during the strategic design stages. In this respect, the PrimeOptics case is an example of how *not* to carry out reflexive design.

Reflective practice during redesign

Reflexive design theory is in part based on Self-Design thinking (Mohrman and Cummings 1989; Weick 1977) and it is a design process characterized by multiple iterations. As different stakeholders enter the picture, goals, design criteria and new designs are subjected to continuous scrutiny and modification. Design work often cycles back to earlier stages, incorporating new values, ideas and information. This occurred when the researchers entered the picture and led a comprehensive review of design approaches and ideal theory compared to taskforce activities. It also occurred later, as the new transition team members studied earlier design work and made operational design changes at implementation. Despite these limited connections to reflexive design theory, it can be concluded that the PrimeOptics redesign process had serious flaws in leaving out the principal stakeholder, top management. It is not clear that additional redesign cycles involving other stakeholders would have been productive, since management rejected most ideas proposed by the taskforce. There was time available for productive reflection and learning with other stakeholders, but the real opportunity existed between the taskforce and top management.

In the absence of sound structural learning mechanisms to stimulate new conversations, what can be tried to trigger learning in a secrecy-based organization? The case suggests that researchers/consultants can create ad hoc or temporary forums, different from the client's typical style of running meetings and conducting the design process. This was accomplished when the researchers presented and led discussions about alternative design theories, and when they asked difficult questions about the value of proposed designs. Therefore, educational interventions and expert consulting, if co-operatively sponsored by both researchers and clients, show high promise for stimulating productive reflection and learning in secretive organizations.

Reflective design under secrecy conditions

We viewed secrecy as both a contextual and organization culture variable. The challenges encountered in the effort reported in this chapter were magnified by the embedded phenomenon of secrecy or the 'need-to-know' culture. As we said earlier, collective reflection is the ability to uncover and make explicit what one has planned, observed or achieved in practice – therefore it is concerned with the creation of collective meaning. Thus, by its very nature, reflexive design

requirements emphasize the need for high involvement of all the stakeholders in the reflection process, in the exploration of alternative solutions and in the creation of shared meaning. Thus 'secretive' culture significantly limits the ability to fully engage in reflective or reflexive design.

We discovered in this study that the challenge is even greater when the secrecy-based culture is coupled with an organizational configuration that is more like machine bureaucracy than adhocracy or matrix. PrimeOptics relied on the hierarchy to get things done and did not have many of the characteristics associated with matrix culture and problem-solving processes. Many limits to productive reflection and learning were identified and addressed in this chapter. We observed low involvement of employees and other stakeholders in decision making and restricted communications between sub-units and levels. The organization as a whole was not used to experimenting with opposite ways of relating and working. However, on a local level, the taskforce manager took steps to open up the redesign process by welcoming outside researchers and modifying deliberations when researchers were present. Some reflexive design was possible at the taskforce level in this secrecy-based company, even without an umbrella of support from top management. We can conclude from our case example that advancement of reflexive design in a secrecy-based organization requires greater involvement of top managers and other stakeholders in the process and willingness to explore both technical and social considerations during redesign.

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