Suggested Improvements in the Introduction of Small Teams into Nortel

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Abstract

Access Networks within Nortel Networks is making an organizational change within its technology group from an emphasis on functional departments to an emphasis on cross functional teams. The primary purpose of the change is to improve the rate of introducing new products or enhancements of existing products to the marketplace with the secondary purpose to improve the quality (low field reported defects as well as more appropriate operational characteristics to suit customer needs) of the delivered products. The organizational changes have had mixed results and this paper summarizes an exploration into some possible solutions to improve the less than expected results of the organizational change.

Introduction

Nortel Networks started as Northern Electric, the manufacturing arm of Bell Canada, some 100 years ago at the time the Bell family was creating the Bell Telephone companies in both the United States and Canada. Much like ATT in the United States, Bell Canada was the sole provider of telephone service and telephone equipment within its national borders.

The ATT divestiture and introduction of competition into the telephone services business beginning first with telephony equipment in the 1960's and then with telephone service in the 1980's was echoed several years later in Canada with a similar action opening up competition in the Canadian telephone service business. Meanwhile Northern Electric became Northern Telecom and began changing from a national company supporting Bell Canada into a multi-national selling telephone equipment into the United States and Europe.

The latest changes have included the merging of the Research and Development subsidiary Bell Northern Research into Northern Telecom accompanied by a name change to Nortel with updated image and branding. Nortel merged with one of the major vendors of computer network hardware, Bay Networks, to become Nortel Networks in 1999.

The driving force behind these changes is the desire to become a more nimble competitor within the telecommunications equipment industry. Nortel must make changes because its technology focus for the last 100 years towards voice circuit switched networks such as the Public Switched Telephone Network is becoming obsolete as digital packet switched networks begin carrying voice traffic. As the PSTN migrates towards packet switching, Nortel must also migrate its product offerings to support packet switching or become another footnote in the history of technology innovation (Nortel Networks Web Site).

Nortel Networks is changing its organization so as to better meet the needs of its customers and compete more successfully against new competitors uncovered by the changing marketplace. The most important change is an emphasis on the development and protection of intellectual property.

Access Networks, a large group of some 600 employees within the Carrier Networks division of Nortel Networks, develops and markets telecommunications equipment on the access side or subscriber side of the Public Switched Telephone Network. Access Networks has undertaken a number of organizational initiatives since its formation in 1990 in which it either led the rest of Nortel or was a close follower of the leaders. Access Networks has obtained ISO9001 quality system certification and Bellcore CSQP quality system certification. Both certifications have required formal documentation of business processes as well as mechanisms to demonstrate compliance with the additional overhead tracking involves.

Access Networks is a flattened organization and has the following basic levels:

- Worker bees who are normally design, test, or support personnel
- D-level or first level manager
- C-level or second level manager (also known as Senior Manager)
- B-level or Director
- B-level or Vice President

Nortel in general uses a banding type of job description and compensation process. Worker bees may be Band 1 through Band 6 depending on job description (manufacturing floor may be Band 1 or 2, administrative assistant may be Band 3 or 4, and design personnel may be Band 5 or 6). D-level managers are at Band 7. C-level managers are at Band 8. Directors and above are at Band 9 and above.

Access Networks is an engineering organization and the culture of the organization reflects engineering. Nortel Networks in general prefers to hire new graduates and then retain them while promoting from within. This general practice appears to have created a layer of fairly young (late twenties or early thirties) managers who have only worked at Nortel Networks.

Nortel Networks tends to promote technically savvy people. The number of managers with a post-graduate degree of some kind within Access Networks as well as Nortel in general is fairly high, though most tend to be technology oriented degrees rather than general business.

The Change to Project Teams at Access Networks

Martin Creveld wrote that the major problem facing a military commander is uncertainty. Clausewitz, credited with first describing the contribution of friction (page 119) (those events that impact performance) towards the outcome of a military campaign repeatedly remarked how uncertain are military expeditions. The development of new products are similarly uncertain due to the same problems of uncertain knowledge and uncertain communications.

Creveld writes (page 270):

> Attempting to generalize from the historical experience studied here, I suggest that there are five such implications, all interacting with each other: (a) the need for decision thresholds to be fixed as far down the hierarchy as possible, and for freedom of action at the bottom of the military structure; (b) the need for an organization that will make such low-decision thresholds possible by providing self-contained units at a fairly low level; (c) the need for a regular reporting and information-transmission system working both from the top down and from the bottom up; (d) the need for the active search of information by headquarters in order to supplement the information routinely sent to it by the units at its

command; and (e) the need to maintain an informal, as well as a formal, network of communications inside the organization.

Access Networks, with the introduction of project teams, is making organizational changes that echo Creveld's implications. Microsoft uses self contained teams as does several companies in Japan and the United States as described by Cusumano & Selby as well as by Nonaka and Takeuchi. The general consensus is that the major impediment for successful projects (defined as projects that complete within schedule and budget with a product that meets the expectations of the customer) is communication.

Traditionally, Access Networks, like most of Nortel, has had a functional organization in which departments were created along functional lines. For instance, there would be software departments or hardware departments at the Senior Manager (Band 8) level. These departments in turn would be subdivided into smaller departments managed by a Band 7 manager. These smaller departments would be specialized as to the type of work they performed. For instance a hardware department at the Band 8 level may be divided into analog circuits, digital circuits, power supplies, and mechanical packaging sub-departments each of which would be managed by a Band 7 manager. Each Band 7 manager in turn would have Band 5 and Band 6 engineers reporting to them. If a particular Band 7 sub-department contained more people than could be managed by a single Band 7 manager, the sub-department would be split into two sub-departments each managed by a Band 7 manager.

The latest organizational change involves breaking down departmental barriers by the formation of resource centers from which people with the necessary skills are drawn in order to create project teams. The approach is similar to a contracting business which provides individuals with specific job skills to clients. The resource center, like the contract business,

provides training opportunities to its personnel and handles human resource issues such as compensation, performance reviews, etc.

Clark and Wheelwright (page 16 Exhibit 1-5) provide a chart which provides support for the organizational changes Access Networks is attempting to implement. Their information indicates that successful projects require cross functional cooperation especially projects delivering high technology products requiring specialized skills.

Observed Difficulties with the Change

The organizational change from a functional based structure to a team based structure has been accompanied by a fair amount of confusion. Part of the confusion has been generated by the local changes to support the project team organization and part of the confusion stems from Nortel company wide changes to support the company's new emphasis on becoming a product development company rather than a manufacturing company that also develops products.

Specific areas of confusion are: performance appraisal, allocation of persons with specific skill sets, material allocation (lab equipment resources) to specific projects, and inter-project as well as intra-project coordination. All of these areas are further exacerbated by poorly trained project leaders who are learning project management at the same time they are trying to lead project teams.

Since Access Networks has primarily one product, Access Node, with several derivatives providing unique functionality, project teams are actually working on sub-pieces of the same product. While the various pieces may be functionally different, because the pieces share the same platform inter-project coordination demands are fairly high.

Under the functional organization, Band 7 managers concentrated on their specific department. This meant that Band 7 managers, since one of the criteria for promotion was

technical competence, were technically competent within a particular area such as mechanical design, software design, or verification. Formal project management was not normally practiced by Band 7 managers because they relied on their experience for the work in their area. The Band 7 managers also communicated with other Band 7 managers and the Band 8 managers. The only Band 7 managers who had to develop any kind of project management expertise were the hardware department managers as they had to interface with suppliers and manufacturing.

Analysis and Possible Solutions

With the change to a projectized organization (see page 150 in Meredith and Mantel), Band 7 managers are being turned into project leaders. This means that the Band 7 managers are now required to manage groups composed of individuals with skills the manager may not have themselves. It also means that the formation of the project team must change to a more formal process. Project team members come from the resource centers so the individuals may have never worked together nor worked for the particular manager. The project leader must learn how to organize and facilitate a project team which will dissolve as soon as the project is completed.

The first solution is to train project leaders. Training must encompass not only the technology side such as project management tools but the softer, non-technology side such as people management. Because most managers have been promoted to management despite deficiencies in their people management skills (human resources tasks such as performance appraisals, hiring and firing, training, intervention, etc.) one of the major obstacles to be faced by the new project leaders is the development of human resources skills.

The compensation system within Nortel is designed to reward personal accomplishment rather than team accomplishment. Each person creates a management by objective plan (a process known as Managing For Achievement or MFA within Nortel). Since end of year salary

adjustments are made depending on the manager's perception as to the person's performance, personal achievement is prioritized higher than team achievement.

Robbins and Finley (1995) provide a number of reasons why organizations have poorly performing teams which can be distilled down to problems with leadership. Teams that are well led operating within organizations that are well led are successful because of the emphasis on human resource management and communication creating trust within the organization.

The recommended solution is to train project leaders in formal project management methods with an emphasis on the human resources area. Mentors who have project management experience must be available to assist the new project leaders to assimilate project management methods changing explicit knowledge into tacit knowledge. Due to Access Networks traditional emphasis on technology and formal processes at the expense of people management, changes need to be made in the selection process for project leaders emphasizing human resource skills as an essential and necessary part of the job. Higher level managers also need to be re-trained so that the hierarchical mindset can be transformed into a network mindset with formal and informal communication pathways being open and honest replacing fear with trust.

Personal Reflections

I wish that I could have written a longer paper including greater detail than I was able. This area of investigation is one that I'm personally very interested since it is my desire to be an able project manager leading project teams developing new products. As I read and research project management, the more convinced I become of how important organizational behavior is to the success of projects. The project is embedded within the organization and the project's success depends to a large part on the organization. I'm also much more convinced of the importance of human resource and people management skills than I was before this paper.

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