Title: Communication, Organization and People Issues in a Product Development Program

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BY

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EXECUTIVE SUMMARY

There is a plethora of project management research and literature available on the high technology and construction industry. We chose to examine a small low technology apparel manufacturing operation based in Oregon. The group specifically focused on the Apparel Product Development program which is made up of various sub projects and involves the Development, Marketing, Design, Engineering and Production departments. The objectives of the study were to understand the entire Development process, examine it for shortcomings and then make recommendations to streamline it and make it more efficient.

Organization Structure

The Development program is operated with input from the Development, Marketing, Design, Engineering and Production departments. The company studied is a matrix organization with decision-makers from these departments having decision making authority at critical milestones. There are approximately 300 styles under development each season which are grouped into a fewer number of product lines. The Development cycle is a project which is repeated for every style of garment all of which are developed simultaneously.

The modus operandi of our study was to interview twenty eight individuals representing the different departments in the Development cycle. In the interviews, each interviewee was asked to describe their functional role in the cycle and then discuss "problem" issues and areas of bottlenecks which they experienced in the cycle. After analyzing the interview transcripts, the group put together a list of tasks which comprise the entire cycle.The group next analyzed "problem" issues and prepared a list of those issues that recurred through the interviews. This list was now classified into three broad categories of **communication, organization and people** issues. Our report addresses each of these issues, discusses the impact of the issue on the cycle and then makes recommendations to deal with the problem. The following is a synthesis of some of the issues identified.

Communication: Knowledge of the total development cycle is lacking by all participants; Few formal communication mechanisms are in place in the cycle; Prioritization of activities is not globally communicated
Organization: Structure of the organization is function rather than product oriented; No clear definition of roles, responsibility and accountability structure; No designated decision makers for each product line; Interim milestones lack deliverable and concrete decisions
People: No clear definition of roles, responsibility and accountability structure; No designated decision makers for each product line

INTRODUCTION

There is a plethora of project management research and literature available on the high technology and construction industry. We chose to examine a small low technology apparel manufacturing operation based in Oregon. The group specifically focused on the apparel product development program which is made up of various sub projects and involves the Development, Marketing, Design, Engineering and Production departments. The objectives of the study were to understand the entire development process, examine it for shortcomings and then make recommendations to streamline it and make it more efficient.

Organization Structure

The development program is operated with input from the Development, Marketing, Design, Engineering and Production departments. The company studied is a matrix organization with decision-makers from these departments having decision making authority at critical milestones (See WBS Appendix 1). There are approximately 300 styles under development each season which are grouped into a fewer number of product lines. The development cycle is a project which is repeated for every style of garment all of which are developed simultaneously. Hence there is significant "traffic" going through each critical milestone which are common for all styles in any given season. This "traffic" results in severe bottlenecks and delays at critical milestones which have a domino effect on the remainder of the cycle. The apparel industry typically develops apparel around four seasons and each season can vary in length from three to six months. Hence there is often overlap between the kickoff and tail-end phases of two consecutive seasons.

The modus operandi of our study was to interview twenty eight individuals representing the different departments in the development cycle. In the interviews, each interviewee was asked to describe their functional role in the cycle and then discuss "problem" issues and areas of bottlenecks which they experienced in the cycle. After analyzing the interview transcripts, the group put together a list of tasks which comprise the entire cycle. These are depicted in the work breakdown structure (WBS) chart in Appendix A.

The group next analyzed "problem" issues and prepared a list of those issues that recurred through the interviews. This list was now classified into three broad categories of **communication, organization and people** issues. In the report that follows, each section addresses one of these issues, discusses the impact of the issue on the cycle and then makes recommendations to deal with the problem. In some cases, our recommendations are substantiated by studies on similar projects which we found in our literature search. In most cases, however, we are unable to substantiate our recommendations given that very little research in project

management has been conducted on development programs in low technology industries.

COMMUNICATION

Communication is the essence of management. In all the different functions of management, communication is needed to make people accomplish their goals[1]. During the development phase, communication is crucial, because almost every department of the organization is involved. The goal of the development phase is to produce a prototype acceptable to management. This period is marked by several committee meetings which represent the milestones in the product and project life cycle. Between two committee meetings, the product is reviewed and reworked until the final design is achieved. If communication doesn't take place properly in the organization, the time needed to arrive at the final product might increase and in today's marketplace, a delay in releasing a product often leads to a failure. So better communication gives better product and this is especially true during the development cycle, when the future of the product is decided between many parties with conflicting interests.

It is possible to identify 3 different types of communication problems which lead to organizational failures[2]. It is when:

- Information doesn't circulate
- Too much information is provided
- Wrong or partial information is given

Among those 3 patterns, excess communication is certainly the less common, but is not to be neglected. At the opposite spectrum, the two others are characterized by a restricted flow of information. The reason for this bad circulation of information is the existence of communication barriers, but to understand this concept, one should first examine a model to explain how communication works.

The common model used to represent communication is given by Shannon and Weaver[3]. This model could be described as follows: the sender transforms or encodes an idea or information into a message, the message is sent through a specific channel to the receiver who decodes it and uses it and finally the receiver gives feedback to the sender, signifying that he has received and understood the message.

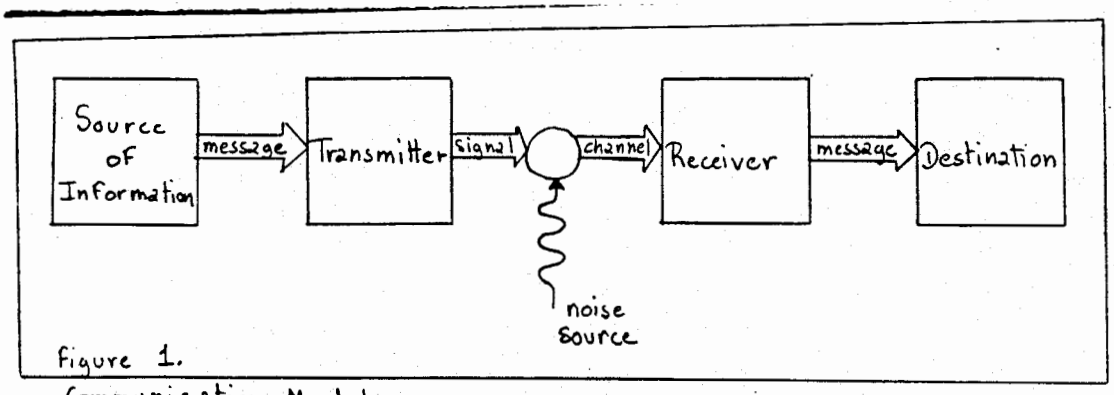


Figure 1.
Communication Model

But this model doesn't take into account the existence of communication barriers which disturb the free flow. Those barriers occur at every level in the communication process. They filter the message and change it. They can be compared to noise in radiocommunication, which tends to make the emission less audible or distorted for the listener. The model can be improved by including the different barriers.

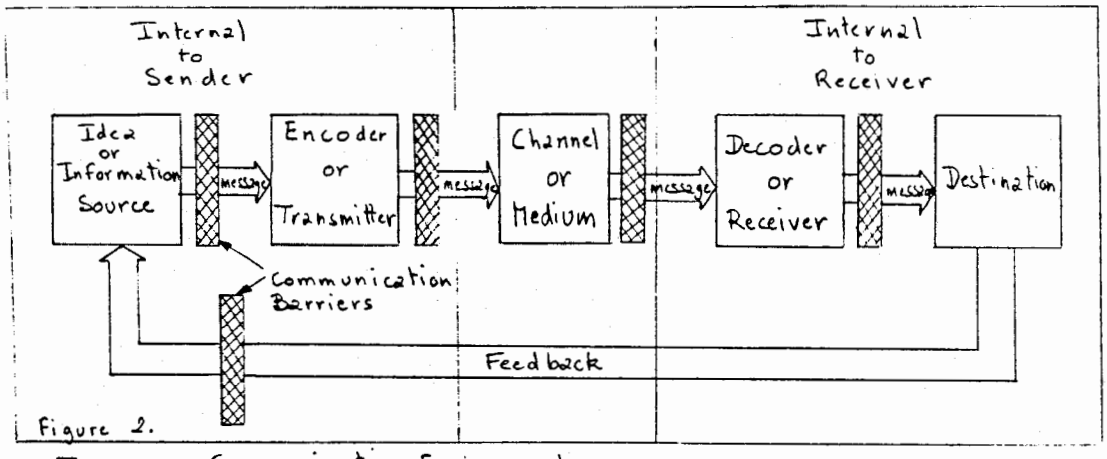


Figure 2.
Two-way Communication Environment

Communication barriers can be classified in 3 categories[4]:
-Intrapersonal barriers: they manifest the sender's or receiver's personality. They are characteristics of individual and explain his behavior during the communication process.
-Interpersonal barriers: they arise between 2 communicating persons because of their differences.
-Organizational barriers: they are not due to the individuals involved but to the communication environment itself.

In the present study, only communication between groups is considered and the problems want to be solved from the organization's point of view. So organizational barriers will be emphasized because the two other types of communication inhibitors need personal work to be overcome.

The main issue to solve communication problems in an organization is to identify the communication barriers because once identified most of the time they are easy to remove provided management is committed to removing them. Different factors in the organization's environment can create organizational barriers. The first is the fear of distorting or omitting information. This issue is very similar to the problem encountered with status and position differences. Typically this fear occurs in superior-subordinate communication. The subordinate modifies his message to

make sure it will be favorably perceived by his superior. To avoid this problem, the superior should create an atmosphere of openness and trust.

The second factor is group size. It translates the fact that communication is made easier in small groups. The example of oral presentation is particularly obvious, when nervousness can make the message less clear[5]. Since it is not always possible to have smaller groups, people in the organization should learn communication techniques if necessary or, at least, listeners should concentrate on the message, not on the person.

As said before, information overload is a limitation to effective communication. A person can only deal with a limited amount of information. Once this limit is reached, information is not treated properly. Only relevant information should be part of the message. This should be a concern for the manager as well as for his subordinates. The communication policies should also define information needs in the formal channels of communication. Also the medium used to transmit the message should be adapted to the nature of the communication channels and to the need for timeliness, accuracy and speed. To reinforce the message, a multimedia approach should be adopted.

Another organizational barrier is the organization size. With an increase in organization size, the relays become more numerous and the message more distorted. The formal communication channels tend to make communication impersonal. This could result in the development of informal channels. A solution for this problem is to give guidelines, for communicating in formal channels.

A competitive attitude often creates conflicts between different departments and blocks the flow of information. A general cooperative climate should exist in the organization. Exchange of information should be the general rule[6].

Some factors which inhibit communication are real physical factors. They include distance between the people who communicate, noise, distractions and spatial arrangements. To deal with this problem, the physical barriers should be removed or lowered. The reference groups can also play a bad role in the communication process. They put pressure on their members or aspiring members. This impedes the flow of information. The manager has to recognize those groups and their norms to have them as allied forces in the search of productivity.

The last organizational barrier is the big number of transfer stations. As said before, this leads to a distorted message as well as delays. To prevent this, written material can be used to keep the original message, when many transfer stations are necessary. Face-to-face communication can also be a solution.

In the present study , some issues have been identified as being communication problems in the company. The first step is to find the barriers

involved and the second one is to propose a solution. For each problem listed above, some solutions have been proposed. In the interviews, solutions have also been given but they are more specifically related to the company. So a comparison between the 2 types of solutions should be done in order to validate the internal solution and to improve it.

The first problem stated as a communication problem, is the lack of knowledge of the total development cycle by all the participants. In others words, this means that every department is working isolated without any real effort to inculcate good communication. The origin of this problem is the territorial and adversarial attitudes in all departments. This expresses the existence of organizational barriers in terms of competitive attitudes between departments and in terms of reference groups (each group taken as a reference group). The way to solve this kind of problem is first to be aware of its existence and secondly to create a positive climate in the organization pushing the cooperation between the departments. A cultural change is needed. The proposed resolution takes only one step in this direction. The organization structure remains the same even if a product line responsible is appointed in each department. The company should boost the cooperation between the departments by creating real interfunctional teams for each product line.

The second communication problem, that arises within the development cycle, is the lack of formal communication channels. Information doesn't circulate freely from one phase of the development to another. Two barriers are responsible of this bad flow of information. The first and main one is certainly the organization size and the second one is may-be the information overload. Both can be solved as see before by defining precise and realistic organizational communication policies for the formal channels. By this means, information will be concise and channeled to all employees who have a need to know[7]. The proposed solution is doing exactly the same. The company plans to define inter-department methods and rules of communication. This will consist of showing the media to use and the contend of the message to make it clear to all members of the development cycle.

The third communication issue that takes place in the development cycle is that the prioritization of activities is not communicated to every participant. The prioritization is decided by the upper management. Communication in this case occurs or should occur between high and low level of management. Therefore two kinds of communication inhibitors exist. The first one is the difference of status between the two persons or groups involved in the communication process. The second one is the number of transfer stations. The solution to suppress those barriers is to create an atmosphere of openness and trust between the different levels of management and to give written record or mail of pertinent decisions. The company envisages a better definition of the priorities , so that they are easily understood. This doesn't remove the organizational barriers, just the contend of the message is changed. So the real problem isn't seen. Certainly a simple message will

travel better through the channels of communication, but it will still encounter the barriers identified above.

The last problem seen as a communication problem is that the roles of the participants, their responsibilities and accountability is not clearly defined in the development cycle. This problem is closed from the first problem, the same communication barriers are involved and the proposed solution is quite similar. So the conclusion concerning this problem will be the same as before. The company should try to change its culture to facilitate communication and create real teams for each product line. Once a real will of good communication will exist in the company, a clear message would help communication. The second step is therefore define clear level of responsibilities and roles. The last step is to communicate them.

Communication is fundamental in the success of a product-line at all the stages of its development. In the company studied several communication problems exist and the way they are overcome shows that sometimes the company is not even conscious of the real problem. A important point to notice is that the interviews conducted in the company had not communication problems as first purpose. So some other communication barriers might exist and only a real audit of the company will identify them. The program to solve the communication problems could consist of three phases:
-modify the communication environment: this is the longest step because it includes cultural changes. The structure of communication, the people involved in the communication process and the physical environment are the different factors to work on.
-modify the message: only the needed information should be delivered. This includes changes in form and contend and this could be easily done by having clear communication policies.
-communicate: send messages and listen.

As it appears in those three phases, communication problems could not be handled and overcome without considering both the organization and its people. This makes those problems very complex.

ORGANIZATION

Leaders of successful companies and other institutions generally attribute a significant part of that success to good organization. The design of organization is one of management's major priorities, and aims to devise appropriate structural arrangements. Organization structure is a means of allocating responsibilities, providing a framework for operations and performance assessment and furnishing mechanisms to process information and assist decision-making. Deficiencies in structure can give rise to severe problems.

For product/project development, there are five alternative structural designs to choose from. This choice is not simply a technical matter but also reflects the preferences embodied in a company's dominant culture. In addition, contingencies such as the organization's scale, environment, diversity and type of membership need to be considered.

Galbraith [18] distinguished different types of project management systems on a continuum according to the relative influence of the project manager and functional managers involved. Based on Galbraith's work, Larson and Gobeli have identified five different project management structures.
Table 1 summarizes each of these structures.

Table 1. Project/Product Development Structure [8]

Structure	Description
Functional	The project is divided into segments and assigned to relevant functional areas and/or groups within functional areas. The project is coordinated by functional and upper levels of management.
Functional matrix	The project manager has limited authority groups. The functional managers retain responsibility and authority for their specific segments of the project.
Balanced matrix	A project manager is assigned to oversee the project and shares the responsibility and authority for completing the project with the functional managers. Project and functional managers jointly direct many work-flow segments and jointly approve many decisions.
Project matrix	A project manager is assigned to oversee the project and has primary responsibility and authority for completing the project. Functional managers assign personnel as needed and provide technical expertise.
Project team	A project manager is put in charge of a project team composed of a core group of

personnel from several functional areas and/or groups, assigned on a full time basis. The functional managers have no formal involvement.

At one extreme of this table is the traditional functional organization whereby the development project is divided into segments and assigned to relevant functional groups with the heads of each functional group responsible for their segment of the project. The project is formally coordinated by functional and upper levels of management. At the other end of the table is the project organization, or project team. Here a project manager is formally assigned to manage a select group of professionals who operate outside the normal boundaries of the organization to complete the project.

Between these two extremes lie different types of matrix structures. Matrix is a "mixed" organizational form in which the normal vertical hierarchy is "overlaid" by some form of lateral authority, influence, or communication. In a matrix there are usually two chains of command, one along functional lines and the other along project lines. Furthermore, participants are often assigned to multiple projects. There are three forms of matrix structure: A functional matrix occurs when the project manager's role is limited to coordinating the efforts of the functional groups involved. Functional managers are responsible for the design and completion of technical requirements within their discipline. The project manager basically acts as a staff assistant with indirect authority to expedite and monitor the project. Conversely, a project matrix refers to an arrangement in which the project manager has direct authority to make decisions about personnel and work-flow activities. The project manager is responsible for the completion of the project, whereas the contribution of functional managers is limited to providing resources and advisory support. Finally, the balanced matrix is a pure matrix in which the project manager is responsible for defining what needs to be done while the functional managers are concerned with how it will be accomplished. Both parties work closely together and jointly approve work-flow decisions.

In this section, the effectiveness of these five structure will be discussed, followed by examining the advantages and disadvantages. Next, we will discuss the issues related to the product/project management structure which have been identified through the interviews. Finally, we will synthesize our observations and present possible solutions.

2) The Literature Research

2.1) The importance of project management structure on development success

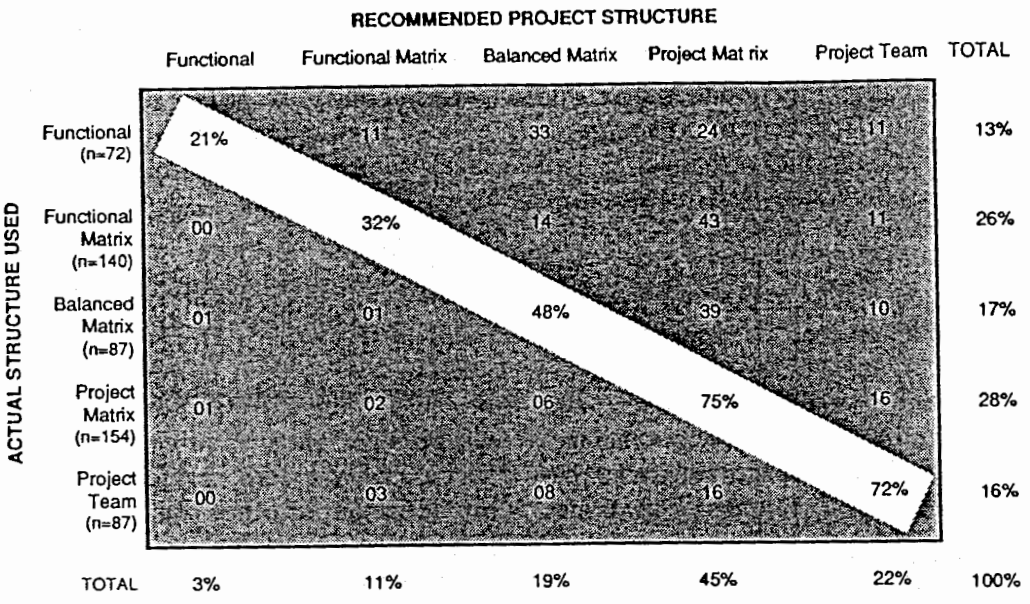
In 1988-89, Larson and Gobeli [8,10] conducted a study to investigate the significance of project management structure on the success of 540 development projects, and revealed that success varies according to the project structure used, and that project structure does have a significant effect on success even when other determinants are accounted for.

Comparisons of individual project structures revealed that the functional organization is clearly an inferior means for managing a development project. To a lesser extent, the same was true for projects using a functional matrix which were found to lag behind the other three project structures. The relative strengths and weaknesses of the balanced matrix, project matrix, and project team were less discernable. The balanced matrix appears to have an advantage in controlling cost while the project matrix and project team were better able to meet schedule. All three structures achieved comparable results with regards to technical performance and overall results.

Table 2 shows the percent of projects which were successfully meeting their parameters.

	Schedule	Cost	Tech. Performance	Overall
Functional	25	25	50	34
Functional Matrix	36	25	50	40
Balanced Matrix	42	50	70	58
Project Matrix	50	46	70	62
Project Team	50	47	70	63

Another interesting finding by Larson and Gobeli are their insights into the appropriateness of different project structures by asking what structure respondents would recommend using if they were to do it again. A comparison between usage and performance is shown below.



Looking at the diagonal percentages which indicate the proportion of respondents who felt that the structure should remain the same, only 21% of people evaluating projects using a functional organization recommended that the same structure be used. In sharp contrast, over 70% of the respondents reporting on projects using either a project matrix or a project team recommended retaining the original management structure. Less than one third of the respondents evaluating a project which used the functional matrix recommended retaining this structure, whereas this was true for less than half of the respondents reporting on balanced matrix projects. So, despite the relative success of the balanced matrix, more than half of the respondents would have recommended shifting to a different structure.

The off-diagonal percentages indicate that a different project management structure was recommended. These results indicate a strong preference for a structure that allocates considerable authority and responsibility to the project manager. For example, 39% of the respondents who worked on projects using a balanced matrix recommended using a project matrix, whereas another 10% recommended a project team.

Overall, the project matrix received the strongest recommendation with 45% of the total sample recommending that this management structure should have been used to complete their project. The project team was a distant second with 22% of the responses, followed closely by the balanced matrix with 19% of the responses.

Several other individuals along with Larson and Gobeli have conducted research in this area:

Corey and Starr [11] concluded from their study of 500 large manufacturing firms that strong project leadership in the form of a project team or project matrix was critical to the successful development and introduction of new products.

Rubenstein et al. [12] examined development projects in nine large firms and reported that project structure influenced technical success but not necessarily market success.

Katz and Allen's [13] study of 86 R&D projects revealed that superior results were achieved with a balanced matrix in which the project manager had primary control over managing the project while the functional managers retained influence over technical details.

Might and Fischer [9] studied 103 development projects in 30 different firms and reported that at a statistically significant level, some form of decentralized management structure (specifically, a matrix format) was positively related to project management success, as measured by overall impressions of project performance or by cost performance.

2.2) Important factors in successful project implementation.

Pinto and Slevin [18] based on a survey of the literature and interviews with project and program managers identified ten general factors that they found to contribute to the successful implementation of a project. These critical success factors were found to be generalizable to a wide variety of project types and organizations. The following is the list of these ten factors.

1) Project mission - initial clearly defined goals and general directions.

2) Top management support - willingness of top management to provide the necessary resources and authority/power for project success.

3) Project schedule/plan - a detailed specification of individual action steps for project implementation.

4) Client consultation - communication, consultation, and active listening to all imparted parties.

5) Personnel - recruitment, selection, and training of the necessary personnel for a project team.

6) Technical Task - availability of the required technology and expertise to accomplish the specific technical action steps.

7) Client acceptance - the act of "selling" the final project to its ultimate intended users.

8) Monitoring and feedback - timely provision of comprehensive control information at each stage in the implementation process.

9) Communication - the provision of an appropriate network and necessary data to all key actors in the project implementation.

10) Trouble shooting - ability to handle unexpected crises and deviations from the plan.

2.3) Advantage and disadvantage of the five project management structure

Crawford [17] has summarized that no one structure is inherently superior and that the choice depends on assessing the relative advantages and disadvantages of different options with the requirements of the project. There are many books which have discussed this in detail. The following is the list of advantages and disadvantages of different project management structures [14][16].

2.2.1) The advantages and disadvantages of functional structures include the following:

Advantages

Flexibility in personnel utilization.

Improved productivity of specially skilled personnel.

Enhanced comradeship of technical staff.

Potential for staff advancement along functional path.

Improved accountability.

Home office to serve as a refuge for project problems.

Discernible line of control.

Disadvantages

Conflict between project objectives and regular functions. Shift in project responsibilities.

Potential for unreceptive attitude toward the project by the surrogate department.

Multiple layers of management between the project personnel and the project client.

Lack of concentrated effort (divided attention between project and normal functions).

2.2.2) The advantages and disadvantages of project structure include:

Advantages

Full authority for the project manager.

Direct responsibility of members of the project team to the project manager (one boss).

Condensation of communication lines.

Skill development due to project specialization. Improved motivation, commitment, and concentration.

Quicker decisions due to centralized authority.

Simplicity of structure.

Unity of project purpose.

Disadvantages

Duplication of efforts on different but similar projects.

Monopoly of organizational resources.

Mutually exclusive allocation of resources (one person to one project).

Narrow view of project personnel (as opposed to global organization view).

Reduced skill diversification.

Concern about life after the project.

2.2.3) Advantages and disadvantages of a matrix organization

Advantages

Efficient use of resources - individual specialists as well as equipment can be shared across projects.

Project integration - there is a clear and workable mechanism for coordinating work across functional lines.

Improved information flow - communication is enhanced both laterally and vertically.

Flexibility - frequent contact between members from different departments expedites decision making and adaptive responses.

Discipline retention - functional experts and specialists are kept together even though projects come and go.

Improved motivation and commitment - involvement of members in decision making enhances commitment and motivation.

Disadvantages

Power struggle conflicts occur since boundaries of authority and responsibility deliberately overlap.

Heightened conflict/competition over scarce resources occurs especially when personnel are being shared across projects.

Slow reaction time. Heavy emphasis on consultation and shared decision making retards timely decision making.

Difficulty in monitoring and controlling. Multi-discipline involvement heightens information demands and makes it difficult to evaluate responsibility.

Excessive overhead-double management by creating project managers.

Experienced stress. Dual reporting relations contributes to ambiguity and role conflict.

2.2.4) Comparative advantages and disadvantages of three types of matrix structures

Advantages	Functional Matrix	Balanced Matrix	Project Matrix
+ Resource efficiency	High	High	High
+ Project integration	Weak	Moderate	Strong

+ Discipline retention	High	Moderate	Low
+ Flexibility	Moderate	High	Moderate
+ Improved information flow	Moderate	High	Moderate
+ Improved motivation and commitment	Uncertain	Uncertain	Uncertain
Disadvantages			
- Power struggles	Moderate	High	Moderate
- Heightened conflict	Low	Moderate	Moderate
- Reaction time	Moderate	Slow	Fast
- Difficulty in monitoring and controlling	Moderate	High	Low
- Excessive overhead	Moderate	High	High
- Experienced stress	Moderate	High	Moderate

3) Analysis of Company Studied

The company that we studied is a small apparel manufacturing company. The product development cycle lasts three to four months, during which 300 product styles are developed. Each style goes through about 40 steps involving various functional departments (see WBS Appendix 1). From the interviews conducted by one of our team members, the following issues and impacts have been identified as being organization related.

* The structure of the organization is function rather than product oriented.

As Larson and Gobeli [10] point out " the functional organization is clearly an inferior means for managing a development project". This issue adversely impacts our company in the following ways:

1) Physical Distance discourages teamwork and constrains communication.

2) A sense of "territorialism" and unwillingness to share information across groups is increased which can lengthen cycle due to miscommunication.

3) Prioritization of activities is difficult due to lack of focus on a single product line and may delay cycle.

* There is no clear definition of roles, responsibilities and accountability among participants in the development cycle.

As Larson and Gobeli [10] point out "the functional approach is generally considered incapable of dealing with the added complexity and information

demands associated with a significant product development effort. Delegating project segments according to functional expertise contributes to bottlenecks and poor integration because there is no formal coordination mechanism and functional specialists tend to adopt a restricted view of the overall project". This strongly substantiates the issues identified from the interviews. A lack of responsibility and accountability structure results in several impacts:

1) Critical decisions may be delayed due to confusion regarding responsibility.

2) Critical information may not be relayed to key team members.

3) Confusion of roles leads to inconsistency in information across product lines.

4) Confusion regarding roles and responsibilities results in territorialism and lack of cooperation across functional groups.

5) Lack of accountability results in poor and /or delayed decisions, possibly made by someone without the proper knowledge and/or authority.

* There are no designated "Decision-Makers" for a product line.

While there are no designated "Decision Maker" in a product line, the decisions appears to be made by the "strongest personality" within each product line. This leads to the following impacts:

1) "Decisions by committee" may delay completion of critical milestones.

2) Decision points may be missed, causing "decisions" to be made by the "wrong" person just to get something completed.

3) Decisions may be ignored or questioned, causing significant delays in achieving critical milestones.

* Interim milestones lack deliverables and concrete decisions.

As Corey and Starr [11] concluded strong project leadership in the form of a project team or project matrix was critical to the successful development and introduction of new product. Since various functional managers are involved in the matrix decision making process, decisions at milestones get diluted resulting in the appearance of a management that is divided. This results in the following impacts:

1) Decisions are made too late in the cycle to effectively meet target milestones.

2) Complete reworking of styles occurs at too many stages in the cycle, resulting in significant delays.

4) Decisions may be made based on incomplete information resulting in reversal of the decision and changes identified too late in the cycle.

5) Changes late in the cycle can result in increased costs due to excess inventories and accelerated lead times.

6) Late decisions result in significant "bottlenecks", specifically in the sample room, causing target dates to be missed and departments to be overloaded.

7) Timelines are extended because final decisions on styles occur too late in the cycle to complete the development process.

8) Product quality may be sacrificed in order to meet final deadlines under severe time constraints.

Recommendations

Our recommendations to deal with these critical issues are supported in some cases by literature. Most of our recommendations, however, cannot be substantiated through literature given that little project management research has been done in the low technology industries.

1) If possible, physically locate team members in close proximity to each other to foster team spirit and promote effective and timely communication.

2) Clearly define the roles and responsibilities of each team member relative to the development cycle.

3) Clearly define all steps of the development cycle, identifying the roles and responsibilities of each organization relative to those steps, the deliverables and decisions to be made, and the information that must be included for each deliverable.

4) Identify the levels of authority for each major decision point in the development cycle.

5) Assign and enforce accountability for meeting major milestones.

6) Designate one member of the project development team to be the decision-maker for the product line.

7) For each milestone in the development cycle, define specific deliverables and decisions to be made before proceeding to the next step; ensure that final "buyoff" is early enough to complete the development cycle.

All our recommendations are focused on strengthening communication between product development teams. Factors such as clear understanding of roles, responsibility and decision making authority among the different function departments are critical to the success of product development project. In order to implement our recommendations, the organization structure should be shifted to a stronger leadership form such as balanced matrix. From our literature research we have learned that balanced matrix structure results in good performance in terms of cost, schedule, technical performance and communication. In addition, we believe that the company should focus on:

a) Setting goals and clearly defining deliverables for milestones in product development projects.

b) Formally monitoring project progress.

c) Management response to deviations.

d) Incentives for performance.

PEOPLES ISSUES

Any manager and especially project managers face problems with staff members. Hughes says, those problems arise because of people and their job conditions. In other words, people's problems come from people's inabilities and personalities, and job situations such as lack of leadership and team conflicts. In project development cycle, the manager has to take care of those problems which are common, because of the large number of people involved[19]. Problem solution methods should be adapted to the types of people's problems and their origins. Those methods are communication, coordination, job training, motivation and leadership.

Dinsmore says the sources of the people's problem are changes in human behaviors due to external factors. In project management, a manager should scan the behavioral changes of his personnel. Dinsmore adds that, in general, four types of behaviors change: knowledge, attitude, individual behavior, and group behavior [20]. There are many classifications for human behavior. Some scientists find all people identical while others find them all different. Leavitt belongs to the first category. For him, everybody has the same needs and ego. So the same tools should be used for everyone[21].

On the other hand, Abraham Maslow classifies people in respect of their needs. Maslow identifies five groups of human needs: physiologic needs, psychologic needs, safety, self esteem and self actualization, in the given order of importance.

According to Maslow, to solve the individual problems in organizations, managers should know what their people need and try to provide them with what they ask for[22].

Another methodology is based on people's abilities. This methodology refers to theories X and Y developed by McGregor[23]. Theory X is applied more to unskilled people. McGregor says that those people should be motivated by satisfying their lower needs (physiologic needs) and therefore the motivation techniques are less sophisticated (basically money). The theory Y assumes that people with higher skills require the use of more elaborated motivation tools because of their creativity and capability. In both cases, properly motivated, workers become productive [23].

On the other hand, Herzberg divides motivation tools into two groups. One group consists of hygiene factors which are basic things to survive, and the other group includes maintenance factors such as safety, love, self esteem and self actualization. Herzberg indicates that people can only be satisfied with a sufficient level of hygiene and maintenance factors. In other words, workers cannot be satisfied if the hygiene and maintenance factors are not in an acceptable range. In addition, high level needs cannot be satisfied unless the hygiene factors are already satisfied [24].

Berne developed a theory based on personality's studies called Transactional Analysis (TA). According to this theory, emotions and relationships with parents (dependency) determine the behavioral structure [25]. Also some managerial approaches propose solutions to people's problems. One of these approaches is the Grid, developed by Blake and Mouton. This theory indicates that there are two dimension for personnel management: people and work. According to the tendencies of people to work or not to work, appropriate motivation tools should be chosen by managers [Adopted from #2]. Moreover, some people are goal-oriented. David McClelland says that these kind of people want to directly participate in the determination of the goals, otherwise they won't work to achieve the company's goals [26]. For example, if they did not participate in the process of goal determination heavily, they say that there is nothing done, nobody did anything, although the others succeeded in the completion of their tasks.

Origins

McGregor says that people naturally do not want to take responsibilities because they represent risks[23]. This shying away from responsibility can in the long run result in sheer lack of interest at work and have many critical consequences. Important decisions may be delayed. In addition, critical information may not be given to the appropriate persons. This causes inconsistent dissemination of information across product lines. Confusion about roles and responsibilities leads to a lack of cooperation among the functional groups or territorialism. To solve

these problems, people should be motivated to do their jobs[23]. The motivation tools should be chosen according to their needs, expectations and qualifications.

Some people's problems occur because of organizational conditions. These issues can be separated into two parts: working conditions and lack of authority or leadership[19].

Job problems can be classified as lack of information about job purposes, disagreement about tasks, lack of role and responsibility definitions, and conflicts with other people. In the studied company, roles and responsibilities are not clearly defined for the people in the development cycle. These cause delays in critical decisions, the retention of critical information, inconsistency in information across the product development cycle, lack of cooperation among the team members and functional groups, poor decisions taken by people not in charge of the product.

According to Hughes, lack of knowledge of the whole development cycle can be solved by increasing communication. Other solutions are to clearly define the roles and responsibilities of people in the development cycle. Then, motivation of people with adequate tools is necessary[19].

Lack of authority, is another organizational aspect which causes people's problem[19]. This problem is also found in the company. Milestones are missed, decisions are taken by unauthorized persons, and even ignored. Levels of authority for each major decision point in the development cycle should be identified. Also the success of motivation depends on leadership. Adequate motivation tools is not enough to solve the problem.
Every level of authority should be adapted to individuals' capabilities. Dinsmore considers four styles of leadership based on people's capabilities[20]:
- Low mature people generally are unable to handle their job, so the leader should follow the telling approach and tell people what to do.
- Moderately low mature people can be managed with the selling approach. For example, the leader should get information and make it presentable.
- Moderately to highly mature people can be managed by supporting them instead of directing them.
- Highly mature people can be managed by delegating them authority.

A possible solution may be to identify the levels of authority and accountability for each major decision point or to designate one member of the project development team to be the decision maker for the product development cycle.

Implementation

For Baker and Wilemon, there is no specific management style for project management because of the uniqueness of each project. Project manager should

support the individual instead of directing them. In addition, a project manager should use methods like commitment, teamwork and sense of mission to solve problems. Moreover a project manager should orient the individuals toward the project goals instead of time, cost or any other factors and coordinate people to achieve this purpose[27].

Finally, there are two main origins of people's problems in product development cycle. These are directly linked to people and to their job conditions. People-originated problems come from their inabilities and personalities. On the other hand, organizational dimension of people's problems are the lack of role and responsibility definitions, and the lack of authority in the decision making process. Also in the company, those problems can be identified associated with a lack of knowledge about the whole product development cycle. Solutions are communication, coordination, job training, motivation and leadership. The company should define all of the roles and responsibilities. Communication should be improved for whole product development cycle. People should be motivated according to their qualifications, expectations and personalities. Then levels of authority should be determined for each decision process. Leaders should apply an adequate management style to respond to the staff's qualifications, expectations and needs. The overall success of this program depends on monitoring the results and estimating the future possible problems.

CONCLUSION

It became obvious as the interview transcripts were analyzed that participants of the development program felt that the program was working but that there were grave inefficiencies within the cycle. The participants felt that if these issues were addressed by management, participants would become more productive and the cycle more efficient.

As has already been indicated in the introduction, we felt that the majority of issues could be categorized into communication, organization and people issues. Under communication, the interviewees mentioned that not all participants were aware of all tasks that comprised the development cycle. Our recommendation is to define all steps in the cycle, identify roles and responsibilities of each functional entity and at the beginning of each season assign responsibility for each phase of product line development to specific individuals. The final step is to communicate this information to all participants of the cycle.

This leads to the next communication issue which is that few formal communication mechanisms are in place within the program. The key here is to identify consistent methods of sharing information (email, memos etc.) and then use them! The final communication issue is the prioritization of activities is not globally communicated. Identifying specific levels of authority, gaining consensus on

prioritization of activities and the communicating that information to all participants should help ease this issue.

The first organization issue that has surfaced is the organization structure is function rather than product oriented. We feel that the solution here is to bring together product teams which would be situated in a localized set of cubicles. This proximity would help foster team spirit and make internal communication more effective. Once these teams are brought together, lack of definition of roles, responsibility and accountability would still hamper efficiency. Our recommendation here is to clearly define roles and responsibilities and designate decision-makers in each team for specific decisions. These decision-makers should be held accountable for the decisions they make.

The final issue in this category is that interim milestones lack specific deliverables and concrete decisions. Our advise here is to define specific deliverables and decisions that MUST be made at interim milestones before any further steps can be taken. The committee meetings (red bordered milestones in the WBS), as they exist today, are essentially dates set in stone no matter what level of progress has been achieved in each product style. These meetings should be scheduled when a defined level of progress has been achieved for a group of styles in one product line. If there is any slippage in schedule, control mechanisms should be in place to expedite or crash the schedule.

Perhaps the most critical issues that surfaced in the interviews were those pertaining to people. People's attitudes, behavior and morale are directly affected when their roles and responsibilities are nebulous and they are not held accountable for their decisions. Clearly defining this structure and communicating it to all participants will result in better morale and a higher level of productivity.The lack of designated decision-makers in the cycle has been noted to be extremely detrimental as decisions are often made by the "strongest personality" in each line who may not be the best informed person to make that decision. Our recommendation here is to designate decision makers, communicate these choices and enforce accountability for decisions made.

We have presented a series of issues, impacts and suggested recommendations to help streamline the development cycle in the company studied. Our recommendations are only suggestions and guidelines to deal with these issues. They may not be feasible options depending on the current political climate within the company. However, participants in the interviews did indicate that the development program is suffering extensively because of these issues. Management commitment is critical to any progress being achieved towards these issues which can result in a more efficient and thereby profitable apparel development program.

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