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Abstract: The human aspects of project management are studied, concentrating on three specific areas: (1) team selection, (2) conflicts in project management, and (3) conflict resolution. Interviews at Tektronix, CH2M Hill, Bonneville Power Administration, and the City of Portland Bureau of Environmental Services are included in the report. Recommendations are made about the formation of the ideal project team, and the approaches that can be used for resolving conflicts in the team.

SUCCESS THROUGH PEOPLE:
THE KEY TO PROJECT MANAGEMENT

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**Success Through People:
The Key to Project Management**

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Table of Contents

Executive Summary	3
Introduction	7
Definition of Successful Project	9
Team Selection	14
Types of Competencies	
Types of Teams: Selection Considerations	
Common Features of Competent Team Members	
Confidence in the Team	
Conflicts in Project Management	22
Definition of Conflict	
Source of Conflict	
Symptoms of Conflict	
Conflict Resolution	30
Effects of Conflicts	
Model for Conflict Resolution	
Conclusions	41
References	45
Appendices	46
Interview Questionnaire	
Summary of Interviews	
Situational Approach to Conflict Management	

EXECUTIVE SUMMARY

What are the typical problems faced when managing projects? This question may be asked when one is seeking to really ask: What are the elements necessary for a successful project? It is fairly simple to compile a list of problems which plague one's projects. For example: conflicts, schedule delays, differing priorities, client interference, insufficient funding, indecision, cost overruns, inadequate specifications, and poor communication.

All these problems can either be prevented or solved by applying solid project management principles. Of these managerial problems, some are more of a technical nature, others have a strong touch of human behavior, and a good number have both technical and behavioral components. Studies have shown that at least 50 percent of the problems that exist on projects are either totally or partially behavior in nature.

No matter what the industry or type of project, problems occur either because people (1) make them occur or (2) don't take action to prevent them from occurring. If the majority of project problems are human behavior related, then a proportional part of managerial attention should be aimed there.

As the importance of human resources become more apparent to the management, there has been increasing attention in search of successful project through the people. This study

reviewed the human factor aspect of successful projects. The areas focused included: team selection, conflicts in project management, and conflict resolution.

We found that in project management, people work together as a team to fulfill the goals and objective of the project. As a project manager, it is his responsibility to assure this would happen. Selection of team members play an important role in setting the atmosphere for the entire project. The manager must realize that different personalities are more suited for different projects. Qualities sought after were more directed towards the personal skills as opposed to the technical skills. Technical skills are expected as minimal requirements. Selecting members that will work well together will decrease the potentials for conflict.

Ideal team member would possess the following abilities:

1. Intellectual Ability
2. Results Orientation
3. Interpersonal Skills
4. Planning and Organizing
5. Team Orientation
6. Maturity
7. Presence

The more people work as a team, the more they become involved with each other, and greater tendency for conflicts to exist. Most of the conflicts from the interviews dealt with the

human factors. These conflicts range from very strong influence of human factor, such as personality and value differences, to a weak influence of human factor, such as hierarchical conflicts. Overall, conflicts due to communication dominated. When the project size increases, level of projects that are considered to be high-tech or projects which require less amount of interrelations, technical preference has higher priority. One observation for the projects from the public sector is that they were less influenced by human factor, but rather, they were more involved with funding and politics.

All of the interviewees felt that the human factor is extremely important for a successful project. Conflicts can have both positive and negative effects to the project. The manager's challenge is to accentuate the positive and consequences of conflict and at the same time avoid the negative ones. But the managers must realize that even if conflicts seemed to be having only positive affects, if neglected can create negative affects in the future. This is why the managers for successful projects always attempt to find a solution to the problem and never avoid it.

The method of resolution most often used were compromise and/or collaboration. Both of these methods give a solution to the conflict. The solution was not always the "best" solution but it resolved the conflict and allowed the team to move forward. The interviewees preferred not to use authority because it caused too much frustrations from the rest of the team. Third party method was used when expertise was sought to redefine the project's objectives.

Moreover, the manager noticed that communication within the team is an essential factor to avoid conflict. By increasing incidence of information exchange among the members, it facilitated resolution of conflict more quickly.

INTRODUCTION

The importance of human element in project management is becoming more apparent these days. Many projects that have failed may have been saved if this element more carefully managed. A study by Pinto and Mantel [1], suggests that success or failure of a project is based on several criteria, not on any one measure. This is, however, not to say that human resources was not a factor. When reviewing the criteria for project failure, management issues related to human resources stand out. What this project attempts is to identify the preventive measures. Measures that will help the project team to achieve successful project.

Because of the spectrum of topics related to human resources management, this project reviews three specific areas:

- Team selection
- Conflicts in Project Management
- Conflict Resolution

To do this, first we define what is a successful project. The definition is based on literature and personal interviews.

Procedures used for this project

Much of the project is based on literature. The back-bone of the project, however, is the personal interviews conducted during the term. We conducted seven interviews to support the issues found from literature search. Although a small database, the results of the interviews overwhelmingly support to findings of the literature search. This may be partially due to the focus of our interview: each of the interviews focused on a project that the interviewee felt was a success. A copy of the interview questions can be found in the Appendix A.

Summaries of the interviews are included in the Appendix B. Although not an easy task, all attempts have been made by this project team to remove our own opinions from the results of the interviews.

The lesson learned: Successful project, in terms of human factors, can be identified. And when the lessons from academia are applied to the "real-world", project's chance for successful completion is increased.

The definition of successful project and method of measurement is described. Three aspects of human factors are then reviewed: team selection, conflicts in project management, and conflict resolution. This study offers information from literature throughout the text and wherever applicable, data from interviews have been added.

DEFINITION OF SUCCESSFUL PROJECT

The attempt to gain a more comprehensive understanding of the causes for project success has been a topic of study for many years. There has been several avenues of research with the subject, all of it an attempt to develop methods to help the project managers to evaluate their projects, if not objectively, at least systematically [1]. Three of these are [2]:

- Work focused on developing decision rules and/or decision support systems to aid in making systematic decisions about the project
- Development of a set of indicators or identifiable conditions so that problems with a project can identified and addressed
- Factors that successful projects exhibit

Based on literature search, ten general factors have been identified to be critical 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.

Table 1
Critical Factor Definitions

- 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 the individual action steps for project implementation.
- 4) Client Consultation - Communication, consultation, and active listening to all impacted parties.
- 5) Personnel - Recruitment, selection, and training of the necessary personnel for the project team.
- 6) Technical Tasks - 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 plan.

Source: [3]

Each of these ten factors is related to issues over which the project team and/or its parent organization can exert some measure of control. But four of the ten are directly related to the human factors (personnel, monitoring and feedback, communication, and trouble-shooting).

Much of the interview results indicate that a successful project, in relation to human factors, can be defined in three major categories: success in project, personal satisfaction, and successful team relationship. The attributes of each category are discussed.

Success in Project

The project managers interviewed felt strongly that the successful projects had people who had achieved the following:

- Positive contribution to the project -- all members are actively involved with the project
- Original values and objectives of the project were achieved
- Members felt that they had ownership of the project

Personal Satisfaction

Each of the project members need to feel that the project in someway enhanced and improved their own abilities. In order to accomplish this, the following factors were developed:

- Project was a learning experience
- Some or all aspects of the project was challenging
- Project gave additional values to their jobs
- Personal growth was achieved during the project
- His or her role in the project was fulfilled
- Project terminated properly

Successful Team Relationship

Team with successful professional relationship usually produce a successful project. The factors identified include:

- Trust between the manager and team members exist
- Members are honest with each other
- Members are enthusiastic about the project
- Transition, if any, between the project managers are smooth
- Communication and cooperation exist among the team members
- Manager is fair in the eyes of the team

Measure of a Successful Project

It is easier to measure success of a project if one was concerned with the financial, time, or the quality of the project. The measurement of successful project in terms of human factors are less quantifiable. There are, however, several ways one can measure whether the project is success or failure in relations to the people on the project.

One can easily measure the satisfaction level of the team by observing the daily activities.

When people are satisfied with the project, the following are noticed:

- Team members stay on the project
- Job is done on time

- Product is of high quality
- Presentations at seminars and conferences result from the project
- Little or no conflict exists
- Team members feel that right decisions were made during the project

Project Stage

The interviewees were asked if there was a stage in the life of a project where human factor is not important to the project. The overwhelming conclusion to this question was no. They did respond, however, by elaborating on which stages required more attention.

It seemed that during beginning and the end of a project, more attention will be required to the team. Beginning of the project is the best time to find the right team members (see team selection section). This is the time to define the vision objectives of the project. This is also the time when those members who are not desirable, i.e., not enthusiastic about the project, are detected and weeded out.

It is also important to pay special attention to the needs of the team members during the close-out phase. The project manager needs to make sure that rewards and words of appreciations are given to appropriate members. Project manager also need to make sure that members are not left in the dark with their next assignment, i.e., provide guidance where needed. Project manager needs to understand that all member are valuable and can help you

with your next project.

One interviewee noted that depending on the make-up of the group, sometimes the human factor is not as important. For example, if the group has been together before and functioned well together, this group would need less "baby-sitting" than an unfamiliar group. It is important to note that this does not mean no caring is required, just not as much caring.

TEAM SELECTION

Teamwork. It's easy to recognize. Smart to talk about. Hard to produce. This difficulty can be reduced by having the right people on the project. Selecting the right team members can met or break the job. All too often, people are chosen as team members for the wrong reasons. "Kathy should be on the team because she's interested in the topic." Or, "Ron's feelings would be hurt if he were left out." Or, "Steve should be included because he reports to Kathy." Some of these may be important considerations, but they don't necessarily lead to successful teams. Instead, what should be the focus is selecting people who are best equipped to achieve the team's objective. In this section, we review what and how to select the best equipped people for the team. The review in this section is based on the literature and responses from the interviews conducted for this project.

Types of Competencies

What is a competent team member? According to literature [4] and our interviewees, what matters most is selecting members who possess (1) the necessary technical skills and abilities to achieve the desired objective, and (2) the personal characteristics required to achieve excellence while working well with others. These two factors are discussed in detail.

Technical Competencies

Technical skills are a bit easier to identify than the personal skills. Technical competencies are the minimal requirement on any team members. They refer to the substantive knowledge, skills, and abilities related to the team's objective. These are what a team member must know and be able to do well in order to have a reasonable chance of achieving the team's objective.

Different technical competencies are required for different teams. Although an obvious point, it is a difficult task to know what the critical technical skills are. For example, a seasoned design engineer who is extremely technical competent may not be appropriate on a planning project.

Personal Competencies

Personal competencies refer to the qualities, skills and abilities necessary for the individual

team members to identify, address, and resolve issues. It is really the personal competencies that all people to function as a team. The types of individuals, their qualities as people, the talents they bring with them, and their abilities to work together toward a common objective are critical factors for successful project.

Types of Teams: Selection Consideration

Teams usually form to: (1) solve problems; (2) create something; or (3) execute a well-defined task. Depending on the type of the project, desired characteristics will change. In this section, we further review the qualities that successful team members possess in terms of the type of the projects. The distinctions among team members that appear to suit best the three types of teams are considerations worth making when selecting team members. Properly matching the personal characteristics of a potential team member can avoid potential frustrations.

Problem Resolution

Problem-resolution teams have to rely on trust in order to address issues effectively. The people who seem to do best on problem-resolution teams possess some common characteristics. They are people who are intelligent: that is, conceptual enough to see relationships and analytical enough to reduce problems to meaningful issues. They are also "street-smart". They know how to read the pulse of a problem are able to concentrate on

getting things done. They are sensitive to the interpersonal needs of other team members so as not to complicate issue analysis with relationship snags. Effective problem-resolution team members possess a high degree of integrity.

Creative Teams

Creative team members, while very similar to the problem-resolution team, possess personal characteristics that are somewhat unique. Creative teams are not only conceptual and analytical, but they are also capable of abandoning normative thinking, exploring the possibilities that extend beyond traditional approaches to problems and accepted solutions. The effective members of creative teams are self-starters who take a personal interest in the team's objective. These members also possess a high degree of confidence and tenacity.

Tactical Teams

Tactical teams focus on the operational execution of a task. The members of these teams also possess certain dominant personal characteristics. It is necessary for this team members to be highly responsive. When it is time to execute an assigned task that is part of the technical effort, such execution must occur almost automatically. Tactical teams are focused on precision in terms of a consistent quality of response and dependability in terms of timing. These demands require persons who are highly action-oriented and possess a sense of urgency. Persons must possess the sense of commitment toward the team, its objective, other members,

and the concept of team success.

Common Features of Competent Team Members

Essential Skills and Abilities

Not much can be accomplished if team members do not possess the skills, abilities, and knowledge that are relevant to the team's objective. These abilities are typically technical in nature but the skills vary in ranges.

Desire to Contribute

It is always important to talk to those people who might become part of the team in order to find out a little bit about their personal needs and desires, and how such needs might either support or be in conflict with the team's objective. It is frustrating for all when one team member does not make the connection between his contributions and the overall success of the team. One of the most difficult task for the project manager is to make each team member realize the importance of the contributions that member makes to successful completion of the project.

Capability of Collaborating Effectively

A consistent response from the interviewees was the importance of selecting team members

who were capable of working well with others. They noted that team members needed to deal with others in a collaborative fashion. People should be capable of sharing information openly, capable of listening objectively to fellow team members, and capable of bringing out the best in others. The interviewees also noted that members who were not capable of collaborating effectively with others should be removed as soon as possible.

Confidence in the Team

When strong technical skills are combined with a desire to contribute and an ability to be collaborative, the confidence among the team members are raised. This confidence in turn, translates into the completion of successful projects.

Interview Results

Although competencies requirements may differ from team to team, there are some "common" characteristics that the interviewees addressed. Most importantly to all interviewees, except for one, was not the technical competencies but the personal competencies. Most managers saw the technical competencies as an essential to completing the project successfully. But they all felt that personal competencies make the team work. Most of the managers interviewed would choose persons with the high personal skills with minimal technical competencies over persons with high technical competencies with minimal personal skills.

Some of the personal characteristics include:

- The ability to work with others on the team
- Willingness to commit and follow through the commitment
- Energetic, enthusiastic, honest, friendly, and responsible
- Willingness to learn and listen
- Self-directed and motivated

Interviewees also suggested that sometimes the very technically oriented people can have negative effects on the project. The negative effects come from inability to let go of good technically competent products (but not necessarily the perfect product). If these people are needed to ascertain technical competencies of the project, they should be used as an expert/consultant to the project. This way, the project may benefit from their technical knowledge without the potential negative effects.

Ideal Team

An ideal team members would possess the following characteristics:

1. Intellectual Ability: The ability to secure relevant information, relate and compare data from different sources, and identify issues and relationships; conceptual, analytical, creative.
2. Results Orientation: The ability to work toward outcomes and complete what one starts.

3. Interpersonal Skills: The ability to relate to the feelings and needs of others, and to convey interest and respect.
4. Planning and Organizing: The ability to schedule time and prioritize for self and/or others, to handle multiple activities, and to meet deadlines.
5. Team Orientation: The ability to work collaboratively within a complex organization structure.
6. Maturity: The willingness to be open and act responsibly when dealing with people and situations.
7. Presence: The ability to create a positive first impression and stand out tactfully (includes verbal and nonverbal communication).

Ideal team will have a flat organizational structure. The decision making authority is delegated to the lowest levels of the organization whenever possible. Usually the project is organized with work breakdown packages. These packages are assigned to a leader, who is responsible for successful completion of that package. The number of team member is kept as small as possible, usually three to five.

Selecting ideal team members doesn't mean that the project will automatically be a success. It is just one aspects of ascertaining there will be minimal disruptions and conflicts among the members. In the next section, we review the conflicts in project management.

CONFLICTS IN PROJECT MANAGEMENT

Conflicts exist in all aspects of life. When you struggle with decision on whether or not to eat a candy bar, you have conflict between pleasure of sweets and guilt of calories. In a medium-size manufacturing plant, a dispute between two supervisors leads to a work slowdown and several missed delivery dates. An executive staff meeting in a major corporation erupts into a heated debate between the financial director and the marketing manager over budget cuts [5]. Workers confuse of who to report when the reporting system has multiple bosses. These are few examples of conflict in project management.

Conflict, whether between individuals or groups, is inevitable in any organization regardless of its size and function [6]. Conflict has historically been viewed as undesirable, something to be avoided. The contemporary view is that conflict cannot always be avoided, but it can be managed. All of the organization's individuals and groups have their own objectives and needs. No two of them can ever completely agree on everything because no two of them can ever perceive the same situation in precisely the same way [7]. The consequences of conflict can range from minor inconvenience to major losses in productivity and revenue [8]. In this section, we review the definition of conflict, sources of conflict, and identify the indicators of conflicts. Approaches for conflict resolutions are reviewed in the following section, Conflict Resolution.

Definition of Conflict

Conflict can be defined as a situation in which two or more goals, values or events are incompatible or mutual exclusive [9]. Other way of looking at it is when people striving for their own preferred outcome which, if attained, prevents others from achieving their preferred outcome, resulting in hostility and breakdown in human relations. Differences, disagreements, and competition generate conflict when the parties involved try to deny each other the right to satisfy their own needs. For example, a manager who does not allow employees to take part in decisions that affect them [10].

Conflict at Different Levels

Conflicts in management can occur at any level, whether between two managers, between two employees, or between an employee and a manager. According to Dubrin, conflicts can occur within or between the following four levels [11]:

1. Intra-individual Conflict - Conflict which exists within an individual.
2. Inter-individual Conflict - Conflict which exists between two individuals.
3. Inter-group Conflict - Conflict which exists between two groups.
4. Inter-organizational Conflict - Conflict which exists between two firms or companies.

The different levels of conflict is illustrated in Figure 1.

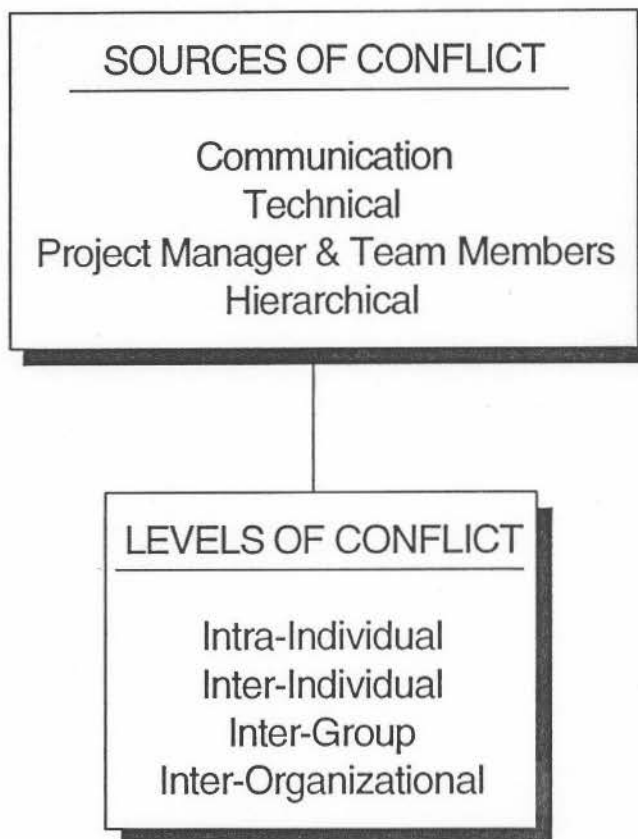


FIGURE 1

For project management purposes, the conflicts being discussed are focused on the first three levels, which are intra-individual conflict, inter-individual, and inter-group. These conflicts are related to human aspects rather than conflicts in other areas, such as monetary or scheduling.

Sources of Conflict

Each of these interviewees had different experiences of conflicts. In general, the conflicts from the interviews can be categorized into following areas: conflicts in communication, technical, project manager and team members, and hierarchical conflicts. Each of these categories is reviewed in detail.

Communication

Communication has a very broad meaning. It is not just the words that we say or write, it can be any means to get a message across between the sender and the receiver. The followings are responses from the interviews that are categorized as conflicts in communication.

- **Different interpretation of results** - This is truly a miscommunication. This happens when a person at the receiving end interprets the message different than the intent of the message or the sender. It could very well be the sender's fault because the message sent was unclear in the first place. This kind of

conflict is referred to as *ambiguity in communication* [12].

- **Coordinating difficulties in multi-discipline projects** - When crossing the boundaries into other disciplinary areas, chances are conflict will exist due to lack of understanding and unfamiliarities about those disciplinary areas. Larger projects require more involvement of other disciplinary areas, more involvement increases level of communication, therefore, increases level of conflict.
- **Lack of understanding about the project** - This is very common in project management. Conflict in this nature exists because the project does not fulfill the five W's (i.e., what are the goals and objectives of the project, why was the project created, when will the project be done, who is responsible for what, and how is the project going to be done).
- **Lack of open-mindedness of team members and project managers** - This form of conflict may have nothing to do with work. It depends more on the personality of an individual. A person with this personality is self-centered, isolated from others, perfectionistic, and contemptuous. Dubrin refers this personality as *abrasive* [13].
- **Team members hold back ideas and information** - Conflict in this nature exists because of the unwillingness to share and exchange information. This happens when the team members are selfish and jealous of each other and insecure about themselves. They think that by sharing ideas, the other might become better than themselves.

- **Team members focus more on their divisions and less interest in the projects** - This is particularly true when team members can excel by staying with their functional groups. Another reason for team members to focus more on their divisions is because promotional opportunities exist through the functional groups, not through projects.
- **Insufficient information on assignments given by the project managers to team members** - As mentioned earlier, this conflict is ambiguity in communication. In this case, the sender (project manager) gives unclear message to the receiver (team member).

Technical

The followings are responses from the interviews that are categorized as conflicts in technical differences.

- **Differences in ideas** - Each person has a different idea, one might think that his idea is better than the others', someone's idea has to be rejected, when this happens, conflict exists.
- * **Project managers have insufficient technical background** - When a project manager has insufficient technical background, he relies heavily on the team members, it in turn, affects his ability to make appropriate decisions.

Project Manager & Team Members

The followings are responses from the interviews that are categorized as conflicts between project manager & team members.

- **Intimidation from project managers** - This type of project manager would have an *aggressive personality* [14]. He frequently verbally or physically attacks other people. He makes a big deal out of a small matter.
- **Differences in working styles** - When a project manager asks his team member to do a task in a certain way, but the team member does it in another way. The member may feel that he is acting appropriately. This may cause conflict between the project manager and the team member. This form of conflict does not just happen between the project manager and the team members, it can happen between the team members as well.
- **Different interests and values: Excellency vs. Schedule** - This happens when a project manager, for example, just wants to get the task done to meet the schedule, but the engineer holds it back because he wants to achieve perfection. In this case, the engineer and the project manager have conflict in values.

Hierarchical Conflicts

These conflicts are related to the rankings in the organization, but they contribute to conflicts relating human factors. The following is response from the interview that are considered hierarchical conflicts.

- **Project managers have inadequate authority for making decisions** - When a

project manager assigns work to a team member, he refuses to do it, and the project manager has no authority, conflict exists. In project management, a project manager usually manages his team members with his expertise and charisma, but a project manager has to have the legal authority when he needs it.

Indicators of Conflicts

It is not easy to know if there is a conflict existing. If a conflict is not physically be seen or told, then one might have to depend on this intuition. The followings are some of the indicators of conflicts which were mentioned during the interviews.

- People are not talking to each other.
- Direct notification from team members.
- Job is not being done.
- Discussions of conflicts in the open.
- In meetings, people are quite and not being suggestive.

As mentioned earlier, conflict is inevitable, but it can be managed. Not all conflicts are destructive; if properly managed, conflicts can be constructive. The topic of conflict consequences and conflict resolution is reviewed in the following section.

CONFLICT RESOLUTION

Based on the interviews and the literature research, some characteristics of conflict resolution process are summarized. We were surprised to note that sometimes literature theory can be different from what it is used in real-life cases.

First, we describe what are the positive and negative effects of a conflict from the manager's point of view. Then the resolution methods commonly used in real-life projects are compared with what the literature suggests.

EFFECTS OF CONFLICTS

Positive-Constructive Effects

If a conflict is properly managed, it can serve as an opportunity for the project. This is especially true in the early stages of project life cycle where the definition of the objectives and the solution are essential [15]. A conflict can be dealt with intelligence to stimulate uncovering of new facts and information.

The positive effects of conflict were noted in several interviews. The incidence of conflicts were used as tools that helped managers to forecast where potential problems existed. These areas were then given additional attention to prevent major problems. Conflicts were used to red flag persistent problems within the project.

The other positive effects of conflict deal with better analysis of the project [18]:

- A conflict forces team members to clarify their views of the project. It helps them to better understand what the project is, what the objectives are, and how to solve it.
- A conflict allows people to improve their education in order to search for new approaches of the problem.
- A conflict stimulates interest and creativity of team members. It helps to further the project's progress and to better fulfill its objectives.

Negative Effects

The main detrimental effects of a conflict are that (1) it decreases the efficiency and effectiveness of team and (2) it creates situations that result in wasted efforts.

Indeed if the work atmosphere becomes unpleasant, all involved become overly stressed and are unproductive [15]. When conflicts arise, people are less cooperative with others in the team. They are more concerned with their own problems rather than the project's objectives. These kinds of attitudes will result in us-against-them environment.

In our case, we were focus on the successful project in term of human factors. So the negative effects of conflicts did not affect the long-term development of project. The manager's role was to spend time and efforts on each conflict and to deal with it in order to find a solution. The methods he used to solve the conflict are discussed later in the report.

In our interviews, one negative effect, however, was noted. A team member was discharged because he did not wanted to work on the project anymore. This caused conflicts among the other members in the team.

METHODS OF COMMUNICATION

The communication inside team group is essential to prevent conflict [16]. This factor was heavily emphasized during the interviews. Most of the conflicts started with lack of information and misunderstanding of ideas. Sometimes conflicts arose between the members because one person spoke to the other in a wrong way.

Based on the interviews, the following guidelines to improve communication within a group have been developed:

1. To communicate within a group is to share not only information, but also viewpoints and feelings. People need to understand the information but should feels free to ask questions. It is important to foster this kind of environment to enhance information

sharing.

2. Communication is a two-way street: A trusting and fair relationship between the manager and the team allows the manager to assess the conflict as soon as possible. If a problem is identified by a member (rather than the project manager), the member should feel free to express the concerns without any repercussions. This way, the manager will be able to plan a preventive approach before the problem becomes a conflict. This is a way to get all members involved in conflict resolution. But to be successful, the manager has to encourage the members to express concerns to the manager. Members need to know that they will be heard, trusted, and recognized.
3. Increase number of communication procedures: We noticed that if information exchange was frequent, there seemed to be less opportunities for conflicts to occur. Exchange of information can be realized in different ways, i.e, increase the number of meetings or improve long distance communication capabilities (e.g., portable phone, communication by network, etc.).
4. Organize meetings without managers: In several of our interviews, this method was used very often. It allowed group to talk without threat of the manager. Usually when the team met this way, they found better solutions. This method is not strongly recommended because it will isolate the manager and will eventually cause conflict between the manager and the rest of the team.
5. Learn skills of talking: Manager needs to have the ability to talk with his team members without offending them. First, he needs to listen people ideas and viewpoints, and analyses them. Secondly, he has be able to give advises in a non-accusatory

manner. Thirdly, if there is a problem in the group, he needs to tactfully identify the source for the problem.

MODELS OF RESOLUTION

The role of the manager is many. Dealing with conflicts among the members is just one of these. A good manager will not only resolve conflicts but also make problems into opportunities for the project's objectives. Several models for conflict resolution exists. One of these, Managerial Grid, is reviewed. A model based on literature is also presented.

The Managerial Grid

The managerial grid presents the general conflict-resolution of Blake and Mouton. There are five ways of resolving conflicts according to this model [15]:

- **Withdrawing or Avoidance:** This is a passive way to deal with conflicts. The problem is not solved, it is only postponed.
- **Smoothing or accommodation:** This method searches for common points of agreement while avoiding points of disagreement.
- **Compromising:** This method tries to find an acceptable solution for all the conflictual parties.
- **Collaboration or problem solving:** This method is the only one which gives the

"best" solution for the problem.

- Competition or forcing: This method uses authority in order to solve the conflict.

During the interviews, we explained this model and asked managers to describe which method they used. The common conclusion was that they always try to find a solution. This means that they never avoid a conflict or try to accommodate the situation. Managers of successful projects mostly use compromise, collaboration, and at the last extreme, forcing technique to resolve conflicts.

Compromise and collaboration methods, as they work at resolving underlying issue, need a commitment from both managers and team members [15]. These methods require the participants to:

- Explain why they favor a given course of action
- Be open to and not hostile towards different opinions
- Work towards a common goal, the project's objectives
- Be ready to abandon their position in favor of another

This method usually works better in a group settings where everyone has the opportunity to talk about the problems. The group meetings can be augmented by individual meetings between the manager and a member, if necessary. Conflict is resolved when everyone can agree on a course of action in regards to the project's objectives.

One interviewee noted that if a member does not agree or believe in the solution chosen by the group, the manager would ask him to leave the team because this member's attitude could be harmful to the project and create other conflicts.

Use of Forcing in Conflict Resolution

The use of authority or forcing to solve a conflict is proposed in the Managerial Grid. This is a very quick solution. It is, however, rarely used in real-life cases. Interviewees did not consider this as a good team building tool.

There were two situations within the interviews where forcing technique was used to resolve conflicts. First case concerned team members that were arguing so much that no progress was made during their discussions. The manager stepped in and used his authority make a decision.

The second situation was a case of a manager coming in a already established project team. The team work did not exist in this group. No one talked with anyone and a lot of duplication of efforts were noticed. So the manager used his legal authority to reorganize the structure of the group.

One important point is that using authority does not mean that the manager has to be rude and close to any comments or discussions. The manager needs to communicate with the on

the course of actions and the reasons for them. He needs to let the team realize that he is not on a "power trip" and doing what he feels is correct for the project for the situations present.

Power, Authority and Conflict Resolution

A model adapted from David L. Wilemon "Interpersonal Dynamics of the Project Manager's Role" [9], see Appendix C, gives which method a project manager should use according to its degree of authority and the nature of conflict's consequences.

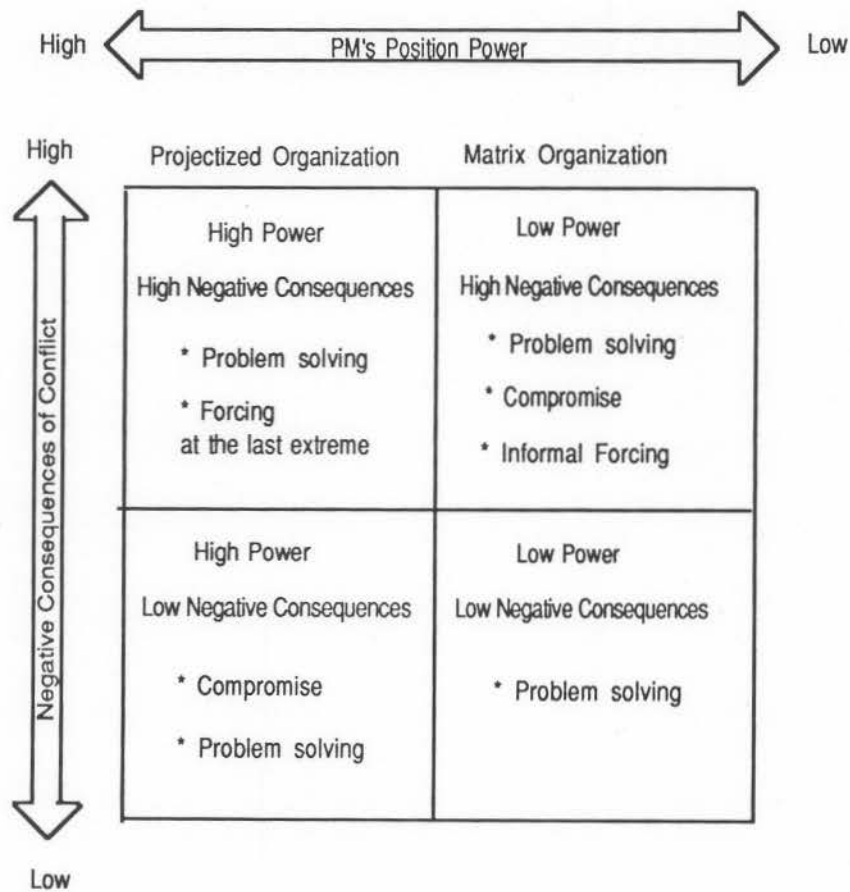
We decided to comment this model because we interviewed two kind of managers: the one who has power to put people out of the team and the one who does not have this power.

The interviewees from CH2M HILL, the structure was a pure matrix organization. Project manager had authority on project's schedule, budget, and decision making. Most of managers believe that if human conflicts are not managed intelligently, they can create very bad consequences on the conflict. In our study, we paid attention only on successful project in terms of human factors. That means that both managers and members had found a solution of each problem and the conflict had been solved before it they had negative effects on the project. They considered that even a conflict that does not seem now to have negative consequences on the project, may become worse in the future. So the smoothing and withdrawal methods that do not result with a solution for the problem, were avoided.

One point came out from the interviews was that no matter how much power the manager had, he would have used forcing method as the last resort. And the manager who does not have authority especially on its team members used some informal methods to try to influence them. As an example [interview with Bonneville Power Administration], the team consisted of 15 people, each from a functional department. But only five people were really working on the project, the others did not have time to spend on the project and were seating on the meetings as source of information for their functional manager. They were not at all involved in the project. In our opinion, this situation does not come up with a arguing discussion, it is more a passive conflict in term of human aspects. Having non-active participants in its team does not give an image of a close and motivated group. In this case, the manager used informal strategies to influence these people to leave the team. An example was to set several meetings where the unwanted person was out of town, so when she came back, she was lost and decided to leave by herself.

A new model was created using the old Situational Approach to Conflict Management Model to reflect the results of our interviews. This new model is not by any means complete nor is it comprehensive. The database used, the interviews, are too limited to develop a comprehensive model. It does, however, show a general relationship between range of legal authorities and the consequences for using a particular method to resolve conflict. This is a good basis for any future work that may be conducted. Figure 2 shows the model.

CONFLICT MANAGEMENT
IN SUCCESSFUL PROJECT IN TERM OF HUMAN FACTORS



Third Party in Conflict Resolution

One question in our interviews dealt with the use of third party to resolve conflicts. Indeed a conflict can be solved by the team and its manager or by a third party from outside the team group.

The answers were very different according to the type of conflict and type of third party. The third party described by the interviewed managers have different forms: a technical expertise, the upper level manager, a consultant from outside the company, or the client.

A third party can be used for different purposes:

- To refocus the objectives of the project: When the team had a difficulty determining which alternative would be the best, they can ask to the client himself.
- To improve information with the help of an expert: This will force the team to decide on one alternative. One problem with an expert is that his solution can be the best one for the task, but not the best one for the project. Another problem is that manager is informally recognizing that team members are not good enough. And this can develop potentially unmotivated team.
- To stop a deadlock in conversation: Usually this is the role of the manager to take a decision in a confusing and arguing discussion. But when the manager does not have the authority on the concerned task, the decision is made by the person who has the power.

As an example [interview at Tektronix], the groups in the team were arguing about who was to pay the cost for a new machine used by both. The manager could not take the decision because he did not have the authority over both groups. So the decision was turned over to the upper level manager who did have authority.

- To have an objective view to the problem and to bring more knowledge on conflict resolution: This is the case where a group asks for a consultant to solve the problem. Actually, this is not a really good solution for both the team and the manager. Indeed by asking someone from outside, the manager admits that he is not capable of his responsibilities and that the team is not able to function. Like the first case, this can create unmotivation and distrust inside the group work. And the consequences can be harmful to the output of the project.

In our interviews, the conclusions were that using consultants or experts are avoided, because they are too risky for the group work. But the customers' viewpoint is often used, with the reserve that a customer can very easily change his needs, and it is the manager's role to balance between the new needs and the terms of the contract.

CONCLUSION

In project management, people work together as a team to fulfill the goals and objective of the project. As a project manager, it is his responsibility to assure this would happen.

Selection of team members play an important role in setting the atmosphere for the entire project. The manager must realize that different personalities are more suited for different projects. Qualities sought after were more directed towards the personal skills as opposed to the technical skills. Technical skills are expected as minimal requirements. Selecting members that will work well together will decrease the potentials for conflict.

Ideal team member would possess the following abilities:

1. Intellectual Ability
2. Results Orientation
3. Interpersonal Skills
4. Planning and Organizing
5. Team Orientation
6. Maturity
7. Presence

The more people work as a team, the more they become involved with each other, and greater tendency for conflicts to exist. Most of the conflicts from the interviews dealt with the human factors. These conflicts range from very strong influence of human factor, such as personality and value differences, to a weak influence of human factor, such as hierarchical conflicts. Overall, conflicts due to communication dominated. When the project size increases, level of projects that are considered to be high-tech or projects which require less amount of interrelations, technical preference has higher priority. One observation for the

projects from the public sector is that they were less influenced by human factor, but rather, they were more involved with funding and politics.

All of the interviewees felt that the human factor is extremely important for a successful project.

Conflicts can have both positive and negative effects to the project. The manager's challenge is to accentuate the positive and consequences of conflict and at the same time avoid the negative ones. But the managers must realize that even if conflicts seemed to be having only positive affects, if neglected can create negative affects in the future. This is why the managers for successful projects always attempt to find a solution to the problem and never avoid it.

The method of resolution most often used were compromise and/or collaboration. Both of these methods give a solution to the conflict. The solution was not always the "best" solution but it resolved the conflict and allowed the team to move forward. The interviewees preferred not to use authority because it caused too much frustrations from the rest of the team. Third party method was used when expertise was sought to redefine the project's objectives.

Moreover, the manager noticed that communication within the team is an essential factor to avoid conflict. By increasing incidence of information exchange among the members, it

facilitated resolution of conflict more quickly.

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Appendix A

Interview Questionnaire

Interview Questions

1. Project Summary

- a. Budget
- b. Number of team members
- c. Time frame
- d. Output (e.g., report, contract drawings, etc.)

2. General

- a. What is considered to be a successful project management in terms of human aspects? How do you measure the success?
- b. In what stages of project management are the human aspects more important to successful project?
- c. When are human aspects not very important?

3. Team Selection

- a. What qualities do you look for when selecting a team member?
- b. How do you structure your team?
- c. What is an ideal size of a team? Related to the budget.
- d. How is the project manager selected?

4. Possible Conflicts within the Project Team

- a. Have any problems/conflicts been observed among the team members in communicating, exchanging ideas and/or cooperating? If so, what are they?
- b. Are there any problems/conflicts between project manager and team members? If so, what are they?
- c. To what extent does lack of planning, ambiguity in project goals and objectives, and ambiguity about the role of team members contribute to conflicts?
- d. What about personal differences such as technical abilities and personality conflicts? Does the hierarchical position in functional group generate conflict?
- e. When do you know there is a conflict?

5. Conflict Resolution in Project Teams

- a. What are the effects for each of the conflicts mentioned above?
- b. How do you resolve them? What method? The use of a third party?
- c. Do you have or use legal authority to resolve conflicts?

Appendix B

Summary of Interviews

NAME : Tim Bennington-Davis

COMPANY : Tektronix

PROJECT : To lead a project behind schedule, over budget, with depressed people.

Old manager = Good engineer, but not a good manager.

Progress and keeping moving.

1. GENERAL

Goals :

To rerun the project.

To restore enthusiasm of team (excitement about jobs).

Balance about schedule and efficiency.

Success : yes because

Thinks where done.

Done in a smooth way.

2. TEAM SELECTION

Team already chosen.

People together for 4 years. (1 year late on schedule and one more year to go).

Manager assigned by upper level :

Team liked old manager.

Important first impression on the team on the first month.

To be consistent.

To inshore confidence.

Management and trust.

Structure :

Change of structure in order to increase communication.

Structure flatter.

12 people reporting to manager.

Same level of communication for everybody.

Improvement of schedule.

Improve sources of information and answers.

3.CONFLICTS WITHIN THE PROJECT TEAM

Kind of conflicts :

- > Many conflicts.
- > Detrust : Don't share ideas between members very well.
- > Intimidation by old manager (Very good engineer).
- > Felling that their own ideas were not going to be accepted.
Old manager = always the good idea.
Stop being creative, only application.
- > Ambiguity about project's goals killed the project before.

Conflict manager / members :

- > Problems about schedule.
- > Team doesn't believe they could make it.

Technology differences :

No problem.

4. CONFLICT RESOLUTION

- > Redefinition of roles.
- > Their work is also to solve problems.
- > Facilitate sharing information.
- > Sometimes taking people aside (communication one by one).
- > Emphasize and education about manager role : To be listened to, to be able to change manager decision, to always have possibility to change if decision was wrong.

Methods used :

- > Compromise market people.
- > Collaboration.
- > Never use third part.
- > Many cases of use of authority :
 - . At the beginning, not so much authority, because manager wanted to gain team confiance, and wanted them to have a good image of manager function.
 - . First some authority used in order to change the structure, then collaboration person by person.
 - . Authority used to organize, to move forwards, to use efficiently energy, to refocus main problems and goals of project.

NAME : Tim Bennington-Davis

COMPANY : Tektronix

PROJECT : Test System and decrease operating expenses

Replace the old manager.

1. GENERAL

Goals : To produce a test system
To decrease operating expenses
To meet time schedule

Difficult situation cause end up with laying off some team members due to goal result.
Atmosphere not happy but the project was a success

Success : yes because meeting the goals

Success in terms of human factors :

- > To secure people who remain about their job.
- > To give value to their job.
- > To trust their manager.
- > To feel that their manager was fair.
- > People who stay need to understand that it was the best solution for a more efficient group, more powerful team.
- > Honesty + Communication + Trust

Measure of success :

- > Trust
- > Job was done in time(time line)
- > Quality of work was high
- > People felt that the right think was done even if it was not a happy story.

Stages of project :

Human aspects were important at the very beginning and the very end of project.

- >Beginning: To establish a team, a vision, some goals.
To communicate vision to the team members.
To detect people who were not enthusiast (Put them away from the project).
Need of individual commitment from each team member.
Need for a dynamic team (mix of discipline).
- >End : To feel rewarded about jobs (telling the world) (constant growth of people).

Manager thanked individually, sponsored them.
To take care of their future (information about what they were going to do now).

Human factors are ALWAYS important.

2.TEAM SELECTION

Qualities of team members :

> First : ATTITUDES

People enthusiast
People responsible
People committed
Mix of discipline, of personality types (creative+practical
optimist+more critic...)
ethical

Rather lower technical skills, but higher attitude.

> Second : Technical skills

Stronger skill can be more destructible for the team.
(more credibility..) => Need of good attitude.

> Ability and willing to growth

Ready to gain new skills.
Ready to learn new methods.
Do not want to push them.

Structure of the team:

> 8 people.

Reporting to project manager (authority for budget, hiring or firing people, resources).

> 3 teams of 3, 3,2 persons (smaller project with leader).

Responsibility to small project leader for technology, resources, planning.
Authority of recommendation to project manager.

> 2 types of meeting:

About total project : 8 people together
common issues
About each projects : Manager + 3 small project leaders

Ideal size of team : 3 to 7 people.

Subdivided work.
Problem of communication in large groups.

Selection of project manager :

Nominated by next level of management.

2. CONFLICTS WITHIN THE PROJECT TEAM

Kind of conflicts :

- > Single biggest conflict : COMMUNICATION
 - What they suppose to do.
 - Why am I doing this.
 - When the job needs to be do
 - Who are the customers.
 - How are my results measured.
- > Example of conflict between 2 members :
 - Fought constantly.
 - Good attitude but poor communication to each other.
 - Manager role : Taught them communication skills beyond personality conflicts.
- > Conflict between Project manager and Team members :
 - . Timing : Members are not sure of their output, but the manager wants to meet schedule.
 - . How to measure the results : constant personal measurement and team measure.
 - . Why are they doing this : To provide a bigger picture (vision and requirements).
- > Financial business constraints : in this case lay off people.

Personal technology differences :

- > Constructive and positive communication :
 - Help to find mistakes.
 - Help to know what needs to be done.
- > Team close door meeting, without manager :
 - Exchange of informations and skills in front of pairs.
 - De-emphasize personal points.

Hierarchy in conflict process :

- > Inhibit pair communication : Don't want somebody looking bad in front of the manager.
- > Need to build trust in both sides :
 - Give information to managers about problems.
 - Tell the mistakes when they are noticed.
 - Not crucify someone making mistakes.

Indicators of conflicts :

- > Lot of discussions, arguments.

- > Objectives and schedule aren't met.
- > Thinks too quiet : Everybody agrees.

3. CONFLICT RESOLUTION

Negative effects :

- > Risk for objectives and schedule.
- > Lose a team member.

Positive effects :

- > Improve education
- > Better understanding.

Conflict = RED FLAG

Indicator of where the manager needs to pay attention.

Resolution of conflicts:

- > If conflict can not be solved :
 - To take the person out of the team.(doesn't fit with the team)
 - Need to believe in the project or in the company.
- > If conflict can be solved :
 - To find a solution.
 - To go throughwards
 - To turn the conflict into opportunities.

Resolution models :

- > To recognize problem.
- > Last thing : use authority
- > Third part :
 - Case of particular expertise (both manager and team need to listen)
 - Otherwise, recognition of manager not good enough to do his job.(should go see upper level management).
- > Compromise and collaboration:
 - People didn't believe in what others guys were doing.
 - Need of discipline and standardization in the work.
 - Importance of answers.
 - Both (manager and team) have to UNDERSTAND on the answer.
- > Refocus on objectives :
 - Quickest way.
 - Review plan in regard with constraints.
- > Forcing:

When environment was out of control =>institute methodologies.

Solutions of Conflict when manager arrived :

Communication.

No remarks about the last manager.

No remarks about people.

No remark about who causes the problem.

Method and control :

Redefinition of jobs and constraints (authority of choosing their own approach).

Assign more responsibilities to team members.

Everybody reports to manager (at least at the beginning) explain why and on what condition it is going to stop (compromise between manager and members).

NAME : Tim Bennington-Davis

COMPANY : Tektronix

PROJECT : Market Research Project

1. GENERAL

Goals:

To interview customers about the future of a crucial product of company.

To be completely objective to company's environment.

To be focus on customers says.

Success : Yes because

They answer the question about future of product.

On time and on budget.

People felt right and good about what they were doing and learning.

A lot of gain of experiences in this "new" field.

2. TEAM SELECTION

First difficulty = To form the team at the beginning (No switching possible).

Qualities of team members :

To find the right person : engineers who believe in marketing research.

Communicated and good presentation people (contacts with customers).

To have open mind, ready to learn.

To be objective (listen to customers' needs and not their own opinion).

Structure of team :

9 people.

Manager assigned by upper level.

Team chosen by manager.

Same task for everybody, even for the manager.

Flat.

Report to manager.

3. CONFLITS WITHIN THE PROJECT TEAM

Kind of conflicts :

Disagreement on what customer said (two people in the interview).

Hard to keep open-mind (to keep focus and objective).

No conflict between manager and members :

Very flat structure.

Same jobs

Share stress.

Manager = more facilitator for using new tool (TQF).

No personal conflicts:

So much communication (6 hours per day).

Any kind of conflict appeared very quickly.

A specific conflict :

Everybody in the company had its own opinion about the future of project (to change it or not and how to do that).

Everybody criticized team results.

Team members getting confused about what customers really wanted and what company would like.

Need of objectivity.

3. CONFLICT RESOLUTION

Conflict = indicator for data not valuable

and need of more information from customers.

No forcing: (only couple of time)

Need of objective data.

People involved and wanted to go and check themselves customers (often both members who disagreed).

Resolution of specific conflict :

To hide on purpose (no going in the cafeteria...).

To study and get a strong model.

Until they get a strong model they believe in, and were able to argue about it.

NAME : John Brunke

COMPANY : Bonneville Power

PROJECT : To define and build new substation design.

To integrate computer and optical transmission to old design.
All entire review.

1.GENERAL

Goals : Time schedule.

Success :

Self-satisfaction of their work.
Feel to be a part in the project.

Measures of success :

- > Team satisfaction of the output.
- > Notoriety in the entire business.
 - Key player in industry.
 - Seminars + trips
 - Technical papers.
- > Esteem and recognition.
 - Individual recognition in the team.
 - Recognition as a good team.

Stages of project :

- > Early stage = Most difficult.
 - Need of people with common vision, direction.
 - People who feel that the project is a good idea.
 - Motivated people.
 - Believe in project.
- Best technical people = enemy of the project
- Need to be a resource for the project but not a member of team.
- Work by themselves.
- Dangerous even if not in project.
- > Pretty easy to run.
- > End : Recognition (by chief executive, all business...).
- Payoff.
- Continuation of benefits.
- Manager push top level to individual recognition.

2. TEAM SELECTION

Qualities of team members :

- > Natural formation by motivated people.
- > Others divisions interested because of prestige (not focus on project but on their own division objectives).
(example of two managers of division wanted to have authority in project).
- > People not too busy by other project (young people, entrepreneur).
- > People enthusiast : try to do themselves to keep projects.
- > To be able to be a team player.
- > Effective, getting job done.
- > Manager : if too busy by other jobs and found someone motivated enough, he will give his work.
To recognize a more effective leader.

Structure of team :

- 4 to 6 people doing 90% of work.
- Matrix structure inside company.
- Flat structure inside the team (same task manager and members) = democracy.
- No related to budget.

3. CONFLICTS WITHIN THE PROJECT TEAM :

Kind of conflicts :

- > Conflicts between ideas
different interests (Schedule / Better tests).
- > Conflict on schedule, equipment properly tested.
- > Conflict on goals and objectives viewed in different ways.

Managers / Team members :

- Members willing versus schedule requests, getting things done, budget limits.
- Balance between risk and schedule.
- Authority of manager : to intimidate people.

Indicators of conflict :

- Things are not done.

4. CONFLICT RESOLUTION :

· Increase ways of communication : by computer, by phone.

Still effort to do it.

· Meeting without manager : group talk better.

Focus on project goals.(if tight schedule), and keep on.

Laugh ambiance (not angry): jokes, gentle buffer...

Third part : Some technical staff.

No consultant (means members are not good enough, and it is not a good message).

Manager = third part between people conflicts.

Use of authority :

No.

Matrix structure (no power over people => Nicky thinks).

No direct authority, only budget, project direction, decision authority.

Authority to functional division.

Problem with deadlog people :

Assign by their division : just want to see.(politic reason, interest of division ...).

Do not help and give opinion on project.

Quiet, angry sometimes, do not want to be involved in project.

Want their name on list, diploma, money, plaques.

Try to decide them to leave by themselves.

(lot of meeting without them).

Erling Soli
City of Portland
Bureau of Environmental Services
Collection System Engineering

Project Information

The cost of this project was about 10 million dollars. The project lasted from July 1988 to October 1991. There were twelve people on the project team. The outcome of this project was a 3 1/2 mile, 6-lane road way, along with sewer and water works.

General

According to Erling, successful project management is when the values and objectives of the project are fulfilled. A way to measure that is to see if the project is completed on time and all objectives are achieved.

Human aspect is important in communicating between team members, as well as maintaining relations, therefore, it is important at all stages of the project.

Team selection

This was a government project, particularly the City of Portland, team members were representatives from different Bureaus. The two main team members were the representatives from Bureau of Waters and Bureau of Transportation. These two Bureaus were the key players because most of the funding came from these two Bureaus. A consultant was hired by Bureau of Transportation to be the project manager. The role of the project manager for this project was to keep the project moving on time, within budget and within the scope of work. In this project, the team members (Bureaus) had higher authority over the project manager. Erling was a team member, in this case, representing Bureau of Environmental Services.

Erling's ideal size of a project team is about the size of this team, 10 -12 people.

Conflicts in Project Management (in terms of human aspect)

Each Bureau had its own interests, therefore, conflicts set in. The Water Bureau was more conservative, where other Bureaus were not. Other conflicts arose from differences in personalities from the representatives representing their Bureaus, also there were lack of

cooperation from the Bureaus as well. Team members met mostly during meetings, and there weren't too many meetings for this project, therefore, definitely lack of interrelations.

Due to lack of interrelations and cooperation, omissions often arose. There was a major conflict that came up during the project. An argument arose between Bureau of Transportation and Bureau of Water over the issue of who should be responsible for paying the damage of water pipes due to the mishaps of the project. The conflict became so intense that later an arbitrator stepped in to resolve it.

Lack of planning and ambiguity in project objectives were not a problem because the project depended heavily on timing and planning, and the consultant (project manager) did a good job on that.

In this project, conflicts got noticed because there were signs of less communication.

Conflict Consequences and Resolution

Conflict consequences were: less communication and cooperation between the Bureaus. The project manager stepped in and served as an interface between the Bureaus.

As mentioned above, the major conflict required an arbitrator to resolve it. In this case, the City Council was the arbitrator who stepped in to resolve the conflict by using its legal authority. The result was that the Bureau of Water to pay for the damage.

**Catherine Fitch
City of Portland
Bureau of Environmental Services
Solid Waste**

Project Information

The cost of this project was about 2.5 million dollars. This project took approximately 18 months to complete. There were seven people, on daily basis, on the project team. The team was to study the possible land fill sites and efficient ways of hauling the solid waste.

General

According to this project manager, successful project management (in terms of human aspect) is when the team members perform their jobs, establish trust, share and exchange ideas, achieve goals and objectives, and of course, communicate and cooperate well with each other. The way to measure success of a project is when the project completed in time and within budget, and every felt good about the project and satisfied with their contributions and expectations.

At some stages of the project, human aspect is more important than others, but generally, human aspect is important at every stage.

Team selection

For selecting team members, this project manager was looking for people with high technical skills for the specified tasks, in other words, people best suited for fulfilling the scope of the project. Also, these people must have friendly attitudes, and the readiness to work and blend in with other members as a team. Similarly, these people must be honest, reasonable, and willing to listen.

The structure of this team was horizontal, that is, communications and connections were made horizontally.

According to this project manager, an ideal size (most comfortable to work with) of a project team is with seven members or fewer.

This project manager was selected by people at a higher level and financial group.

Conflicts in Project Management (in terms of human aspect)

In this project, the project manager noticed that there were conflicts in technical differences among team members, and also because of differences in technical background, led to differences in opinions. Other conflicts arose from miscommunicating and funding. The major conflicts of this project were lack of planning and the ambiguity of the team members' goals and objectives. The team members became second guessing, duplicating work, and dissatisfaction existed due to unmet expectations. Jealousy was also existed among team members.

The conflicts between team members and project manager were mostly resulted from technical differences and opinion differences.

The project manager knew conflicts existed when there were signs of uncooperative and lack of support among team members.

Conflict Consequences and Resolution

The consequences of conflicts for this project resulted with time wasted, hurt of feelings, counterproductive, and people started to take sides.

The project manager let her team members to work out the conflicts themselves. This way, it would generate more of the communicating and cooperating among team members.

The project manager in this project did use her legal authority and asked the team members to leave the team due to the lack of competency.

Summary of Interviews

1. Project Profile

Name: McMinnville Wastewater Facility Plan
Project Manager: Mark Lasswell, CH2M HILL
Budget: \$380,000
Team: Consist of 7 task leaders
Duration: Approximately 10 months
Output: Approximately 500-page facility plan report
Overall: Produced a good product and achieved objective. The project was financially ok. But most of all, it provided opportunities for more projects.

2. General Information

- a. In respect to human aspects, successful project is which people are intrigal part of the project. The team felt that they had positive contribution to completion of the project. The success can be measured by the team's reactions to changes, unexpected requests, etc.
- b. The human factors and contributions are important during all stages of a successful project. Especially, the build-up phase, beginning of the project, can be used effectively as a team building tool. Each task leaders were involved during the scoping and budgeting phases, thereby making this project "theirs".
- c. Human aspects are always important. Once the team is built and everyone has same objective, it may not be as important.

3. Team Selection

- a. Technical background is essential. But beyond that, members that are energetic and have the commitment to perform are desired. Personalities among the members are also considered when selecting the team.
- b. The team was organized by tasks. Each task was assigned to the leader and he/she was responsible with that task, work package. The organizational chart was kept as 'flat' as possible.
- c. The efficiency decreases when more people than needed are involved. Most desirable size is to have all people involved work full time, i.e., if the project needs 10 man/month, a desirable size would be 10 full time people.
- d. The project manager's prior relationship with the client is important. Although technical abilities are pre-requisite, project manager does not have to possess all technical aspects of the project. What's more important is for the project manager to know the 'big' picture to be on target.

4. Possible Conflicts within the Project Team

- a. Selection of the recommended alternative caused some conflict between the two task leaders. The selection process became a competition between the two task leaders. Resolution required consistent method of evaluation. The client was involved in the selection process and the project team decision was kept separate from the client's decision. This was possible because the alternatives were equally feasible both technically and economically.
- b. There was some problem during the completion phase where some of the members had difficulties with taking the analysis and finalizing the product, i.e., they wanted to conduct more analysis. The project manager used authority to get this resolved.
- c. Greater the lack of understanding, greater the potential for conflict exists. Clear communication in the beginning about the magnitude and the importance of the transition from analysis to final product between the project manager and the task leaders may have helped reduce the any ambiguities.
- d. Not much personality conflict was noticed. However, some personality conflict was noticed between the staff from two different offices, e.g., Corvallis and Portland. The two teams became polarized. The member from functional group was not playing as a team member.
- e. Conflict is noted during conversations with the opposite side of the conflict. This was not as evident in a group setting, more so in the individual setting. The project manager needed to do a lot of 'walk around' management to note these conflicts, e.g., talking with each member of the team away from the group setting.

5. Conflict Resolution in Project Teams

- a. Effects of conflicts are that the efficiencies and the effectiveness of the team are degraded. It was not significant with this project but was real.
- b. Whether the person took the responsibilities for the task or not is really dependent on that individual. A tool used was project monitoring mechanism where the task completed was reviewed with percent of budget spent. This project manager felt that the group setting was not the appropriate for conflict resolution. Conflicts among the members based on technical issues required use of objective criteria to remove the personality. Informal authority was used via the peer pressure to perform rather than punish. A key to conflict resolution is to understand the members problems not just identifying them.
- c. Legal authorities tend to be destructive and are not always a good team building tool.

Summary of Interviews

1. Project Profile

Name:	City of Tualatin
Project Manager:	Jory Abrams, CH2M HILL
Budget:	\$700,000
Team:	Consist of 15 members plus a subconsultant
Duration:	Approximately 2 1/2 years
Output:	Fast track project, design of roads and utilities
Overall:	Produced a good product and achieved objective. The project was financially ok. But most of all, it provided opportunities for more projects.

2. General Information

- a. A successful project will be a learning experience and be a challenge for the team. This project was different from others because the team got to see the project from conception to construction. The team was honored by the client during the grand opening of the project. The team members had ownership to the project. Success is measured by the interactions among the owner, contractor, and the design team, i.e., they all got together for frequent social occasion. All members stuck with the team throughout the project. Members expressed that it was a good project.
- b. During the planning/conceptual design stages, human factor is more important. The beginning of the project is the most important time. Construction phase also required more attention to the human factor. But most importantly, when things start going wrong with the technical aspects, the little details/warm fuzzies are important.
- c. Human factors are never not important. It is less important with team that has worked with each other before.

3. Team Selection

- a. Technical competence is necessary. Flexibility and willingness to solve problems that have not been scheduled is desired. Need to have the willingness to committ and follow through the committment. Need to understand how the small part fits into the whole project. This project manager looked for people with the client's best interest, not a hidden agenda. Has to be a team player even if he/she is not the technical expert.
- b. The project was organized by tasks. The task leader was accountable for the entire task.
- c. The optimal size is the smallest as you can make it.
- d. The project manager is usually the proposal manager. This person usally has a good client contact and the technical competency to get the project done.

4. Possible Conflicts within the Project Team

- a. When there is conflict within the project, people don't want to work on your project. This results in late schedule, over budget, no communication, and no fun on the project.

It's ok to have differing opinions. As long as the arguments are healthy, challenging, constructive, and sabataging. Identifying problems without possible solution may cause conflict.

- b. You resolve conflict by getting together and talking about it. Sometimes the PM has to take the decision and make the decision, even if it is not favorable by everyone. Sometimes, third party is used during the contract negotiations. The secret to conflict resolution is to listen to what the others are saying.
- c. Yes. Not meeting deadlines consistently will get you off the project. This creates hard feelings with the members, however.

Appendix C

Situational Approach to Conflict Management

SITUATIONAL APPROACH TO CONFLICT MANAGEMENT

