

Collaborative Negotiations in Tren Urbano

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MIT

Generic Negotiation Model

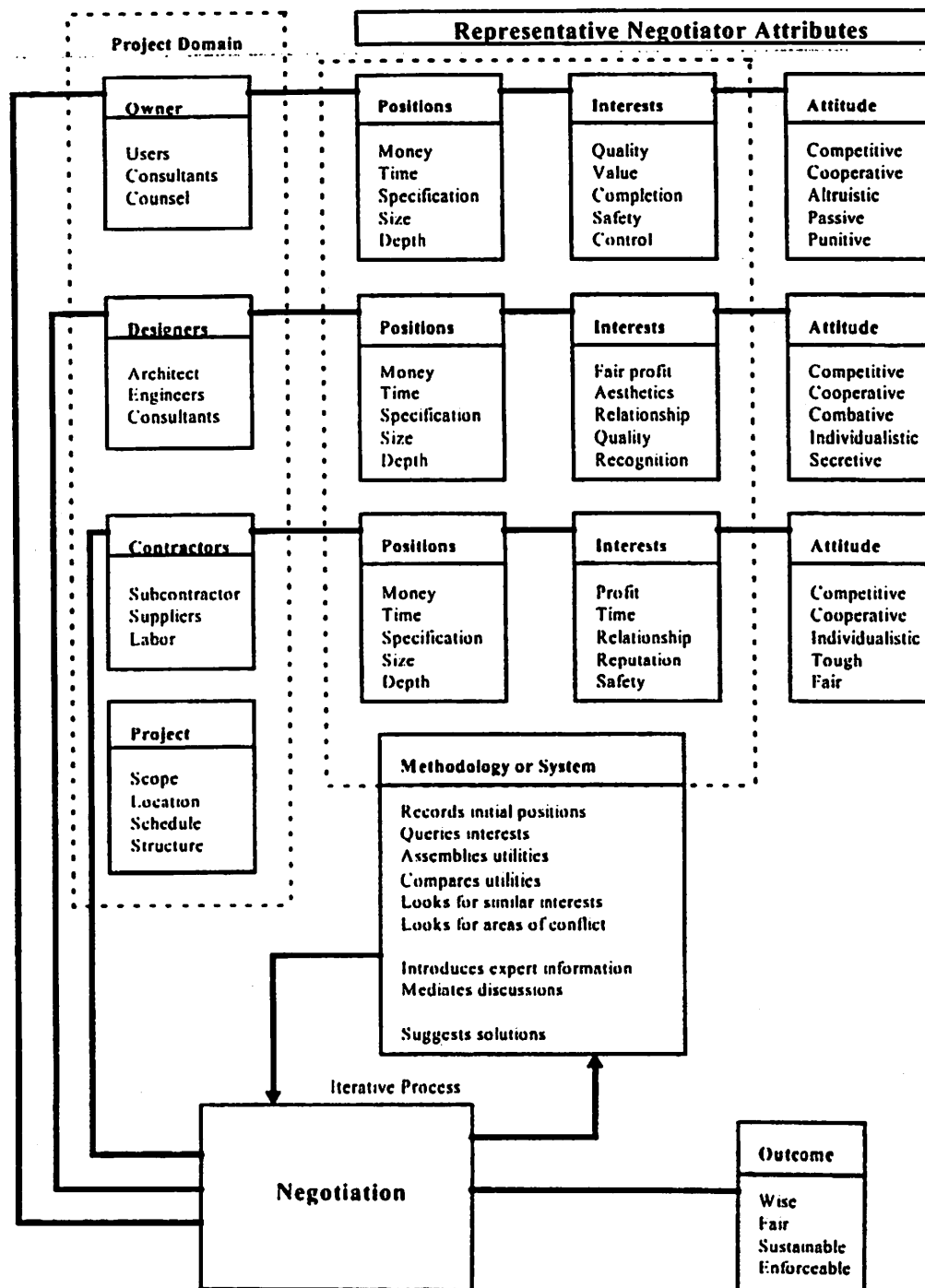


Figure 3.3: The Generic Negotiation Model for the Construction Domain

Need for Collaborative Negotiations in Tren Urbano

- Numerous parties involved
- Varied contracts, positions of interest, priorities, and personal/company style
- Resultant complex network of relationships
- Interest inconsistencies in situations of conflict needs to be reconciled
- This could take lots of \$\$ and time, and create a hostile environment

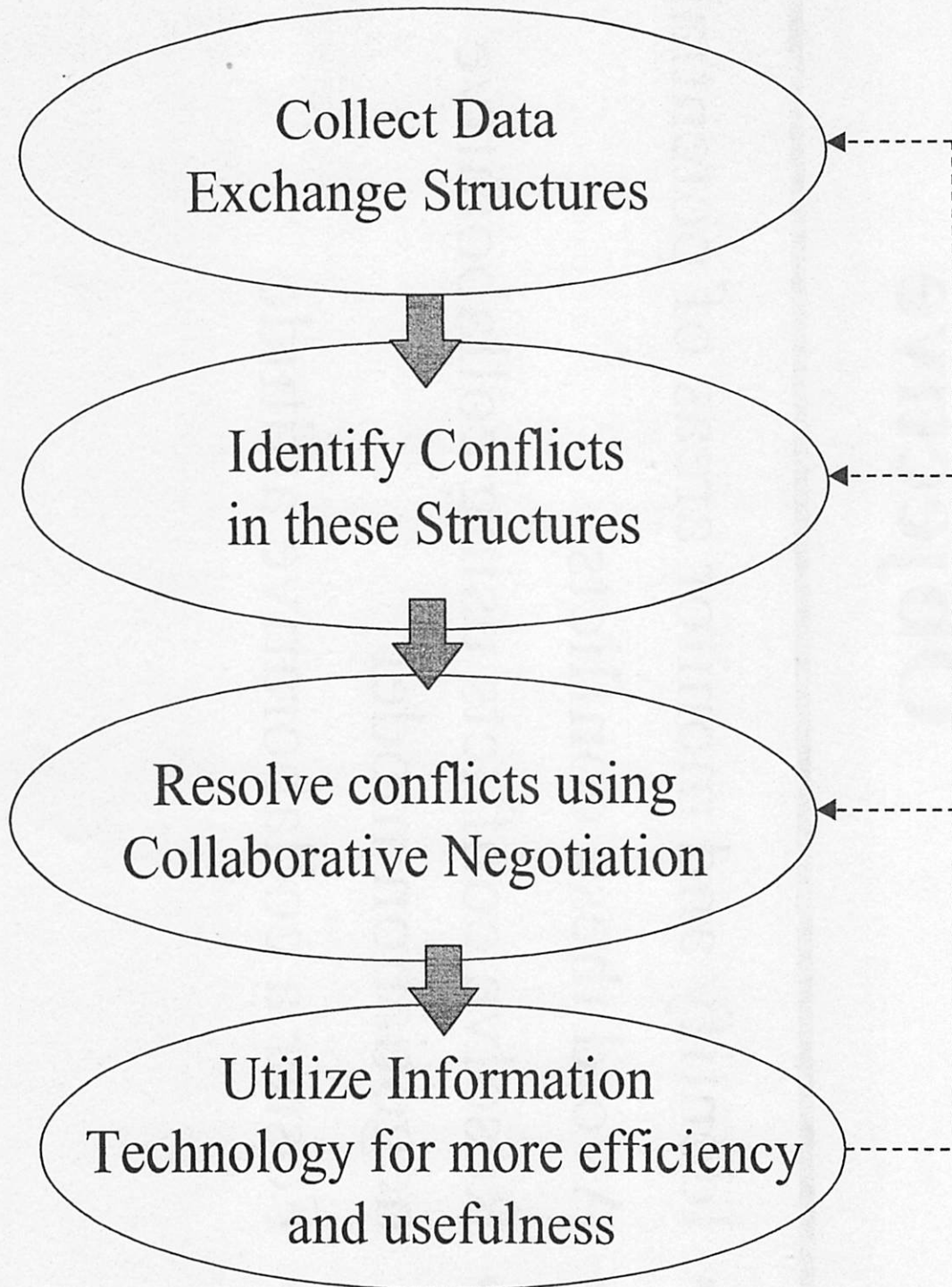
How Collaborative Negotiations can help

- Reduce number of potential conflicts
- Fast analysis of information
- More accurate and sustainable solutions
- Facilitates or mediates the conflict negotiation process
- Savings in time and \$\$
- Better general attitude towards project for project participants and general public

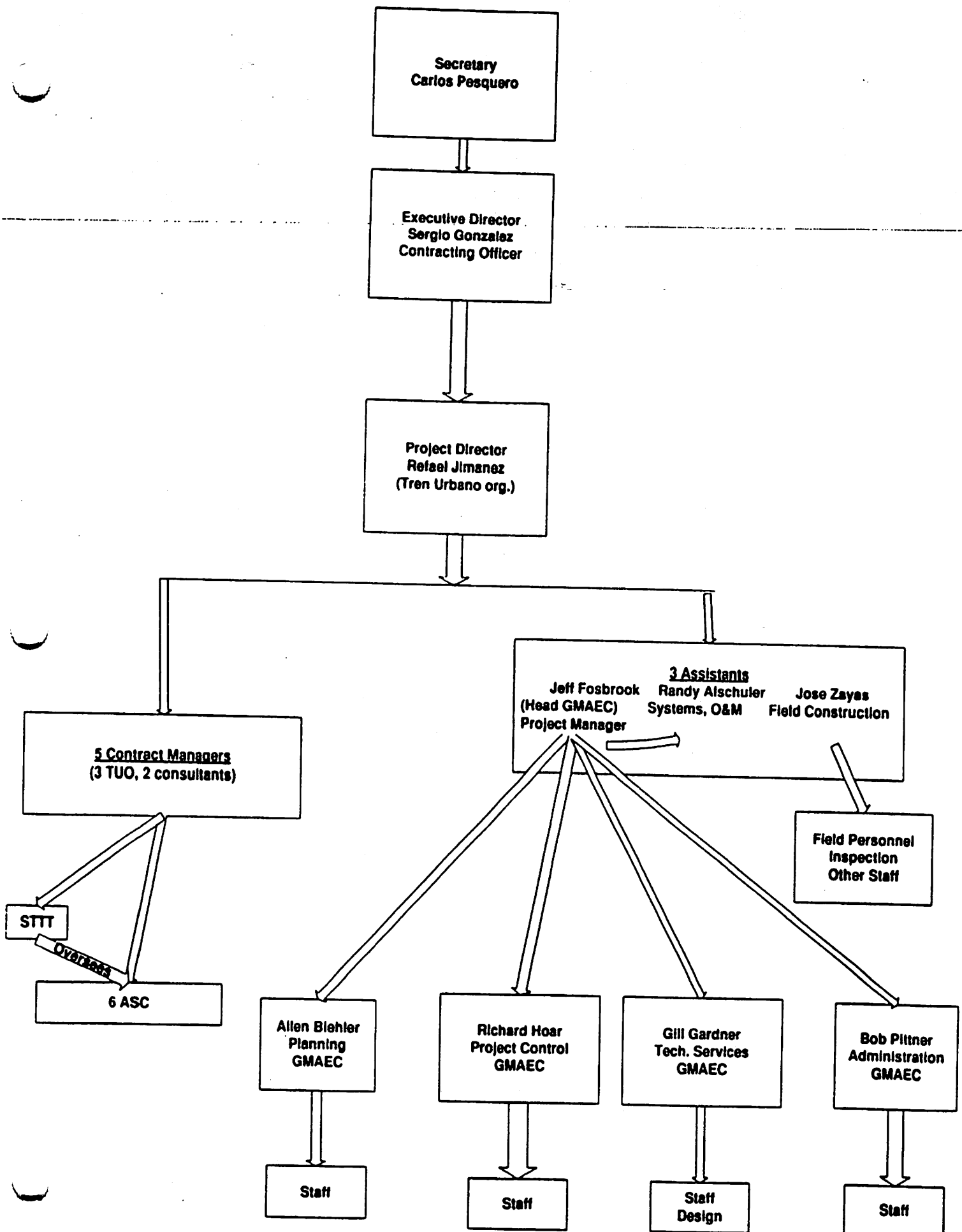
Objective

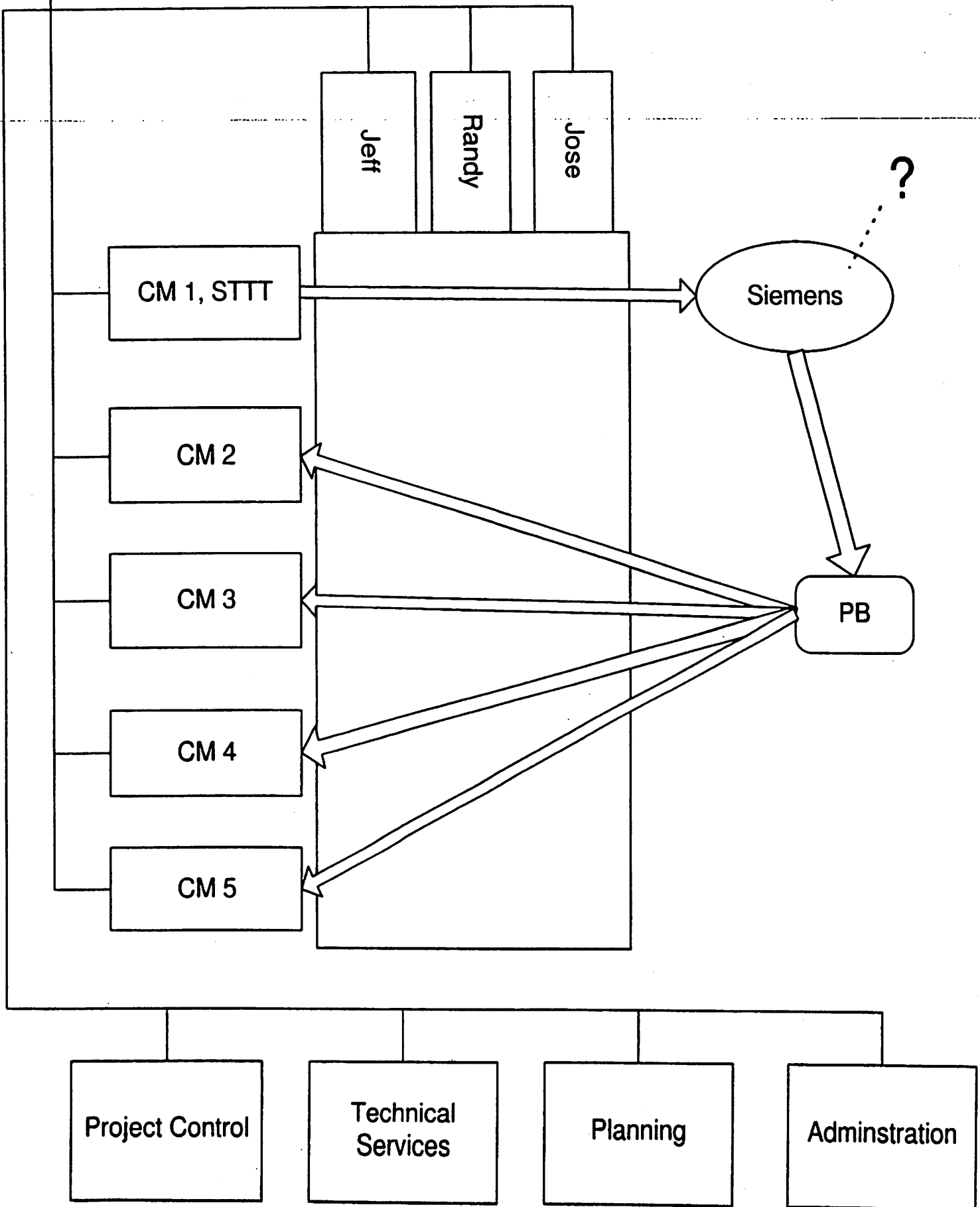
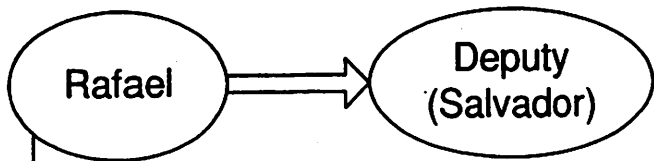
- Identify and monitor areas of potential conflict
- Avoid these conflicts
- Resolve conflicts using collaborative negotiation model
- Foster a collaborative attitude

Research Approach

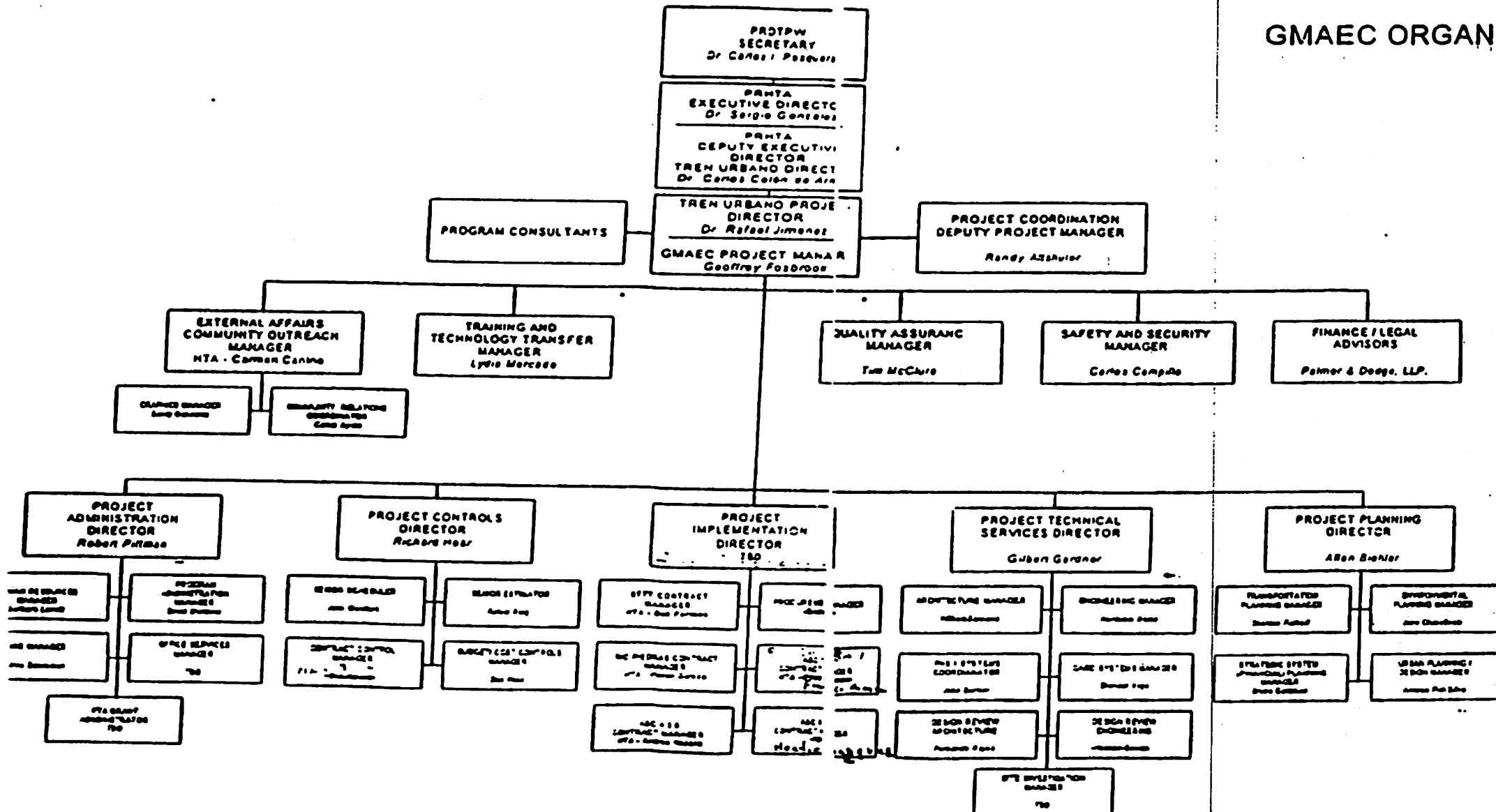


Project Organization





GMAEC ORGANIZ.



Data Exchange Examples

Formal Structures:

- Design review/approval
- Schedule approval
- Change orders
- Budget changes
- Progress payments

Informal Structures:

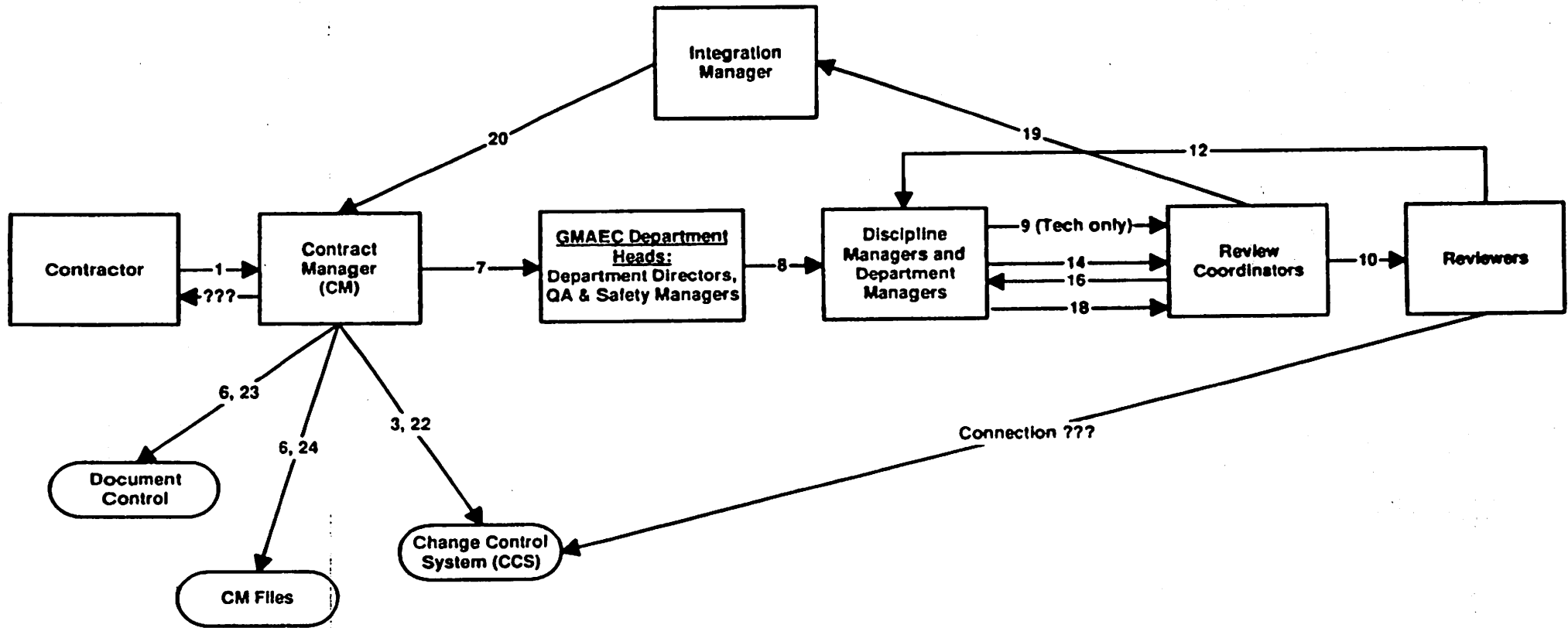
- Lessons learned
- Notification of other parties' changes

TREN URBANO CONTRACTOR SUBMITTAL PROTOCOL (NON DESIGN)

RESPONSIBILITY OF: ORDER OF PROCESS:

CONTRACTOR	1. Submits Contractor approved non design submittal
CONTRACT MANAGER	2. Receives Contractor's non design submittal for review and date stamps the submittal's transmittal.
	3. Enters the submittal into the Change Control System (CCS)
	4. Verifies if submittal is critical or not based on the Submittal Schedule
	5. Indicates due date for return to Contractor
	6. Submits one copy to Document Control and retains one copy in Contract Manager files.
	7. Issues remaining copies to GMAEC Departments Heads based upon submittal type as defined in attached Submittal Distribution Matrix for review process.
DEPARTMENT DIRECTORS / QA & SAFETY MANAGERS	8. Distributes copies of the submittal to the applicable Discipline and Department Manager(s).
DISCIPLINE MANAGERS	9. Distributes copies of the submittal to applicable Review Coordinators. (Applies only to Technical Services Department.).
REVIEW COORDINATORS / DEPARTMENT DIRECTORS / QA & SAFETY MANAGERS	10. Distributes copies of the submittal to Reviewer(s) predetermined by the Discipline Manager (Applies only to Technical Services Department.). and Department Manager
REVIEWERS	11. Reviews scope of work and other Contract Documents for the contract being reviewed to determine Contract requirements.
	12. Completes the Contract Review Comment form for documenting all comments. Comments must be electronically entered on the Review Comment form.
DISCIPLINE MANAGER	13. Reviews completed Contract Review Comment forms for accuracy and completeness.
	14. Submits all documents and forms to Review Coordinator (Applies only to Technical Services Department.).

Non-Design



Identify Conflicts

Preliminary Examples

- Complex delivery system
- Alignment vs. System Contractors
- GMAEC vs. Siemens: Design/schedule review. Duplication?
- Bottlenecks $\Rightarrow$ delays $\Rightarrow$ hostility
- Lack of responsibility allocation
- Who champions priorities?

Conflict Avoidance and Resolution

- Changes in organizational structure
- Changes in data-flow
- Model to support collaborative negotiations methodology which can identify potential solutions.

Project Organization

Secretary of
Transportation

Executive
Director
PRHTA

----- The Project organization is below this line -----

Project
Director
TUO

Deputy
Project
Director

Design &
Planning

Construction

Operations

Planning and
Engineering
Manager

Construction
Manager

Systems,
O&M Manager

Administration

Planning

Technical
services

Project
control

Contract
managers
(alignment)

Contract
Manager
(STTT only)

Human Resources
Grant Administration
MIS
Office services
Program
Administration

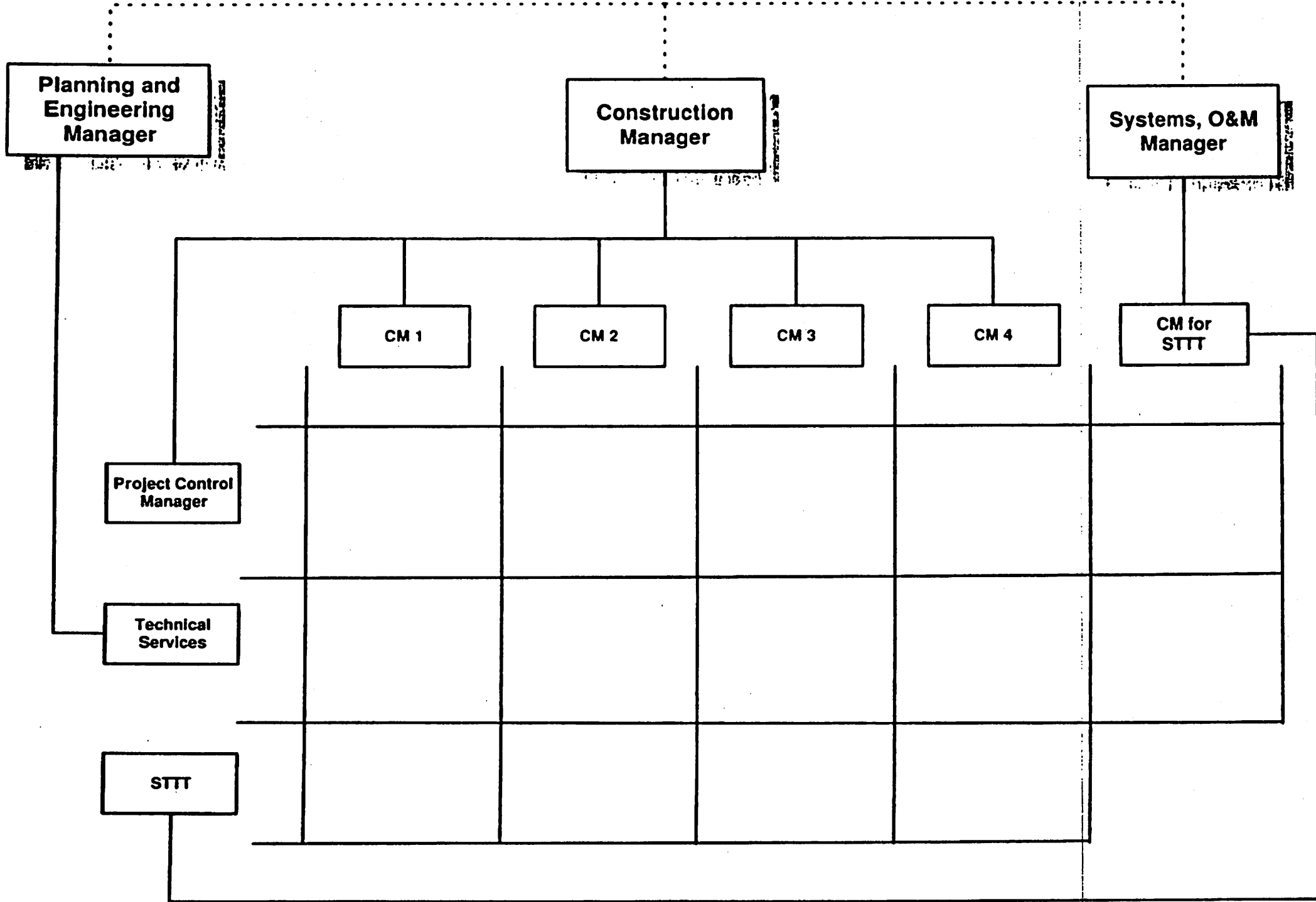
Transportation
Environmental
Urban Planning
Financial
Planning

Engineering
CADD Systems
Architecture
System coordination
Site investigation

Scheduling
Contract Control
Estimating
Budget/cost controls

Alignment
Contractors

STTT



Information Technology

- IT can improve data-exchanges, speed of approvals, tracking of data
- The processes can be easier to follow and less miscommunication can occur
- Loss from personnel turn-over can be easier recovered
- Level of investment, which will have value for Tren Urbano, needs to be evaluated

Collaborative Negotiation
Tren Urbano project
Research proposal
Nina Harpoth
10/15/97

Introduction and Motivation:

The development of large-scale civil engineering projects requires the collaboration of individuals from different specialties in order to address all the different issues that need to be resolved for the successful completion of the project. During the entire life cycle of the project, hundreds of organizations belonging to different specialties may participate. The roles and positions every organization takes are regulated by the contract agreed to prior to the beginning of the project. Each contract is a different type, which lead to varied positions and also varied interests in their contract. As this kind of varied attitude grows to the many organizations involved with the project, the relationships and interests of the huge amount of entities become extremely complex. The conflicts due to interest inconsistency thus occur while they have to collaborate on the same project under the relationships defined by their contracts protected by law. In order to finish the project successfully, they have to work with each other closely and reconcile their different interests and conflicts. Thus, many participants spend great amount of time and money resolving those conflicts because settlements are really uneasy to be found at this level of complexity, because it is hard to find a settlement that satisfies all the interests of all the participants in the project. If the conflicts are not addressed quickly and effectively, the collaborative mode of the participants can be affected creating a hostile environment in which progress on the development of the project is slow or stagnant. On the other hand, if some information can be analyzed and directions can be provided to facilitate or mediate the negotiation process, conflict can be resolved more efficiently and effectively. There are several reasons for this point of view; first of all, using the information and directions can provide more accurate decisions; secondly, using the information and directions can obtain more sustainable solutions; quicker solutions can be obtained because they have the information and directions to support their decisions. Thus, it is necessary to develop a methodology for facilitating/mediating the negotiation process and cutting down the tremendous amount of time and human resources invested in resolving conflicts.

Collaborative Negotiation can be used as a negotiating methodology to resolve conflicts effectively and efficiently. Collaborative negotiation uses game theory (the study of player's action when the decision of any player can affect the methodology) and negotiation theory (the study of the interactions between parties designed to payoff of the players) and combines them using the generic negotiation model (representation of typical parties, structure, relationship, and attributes). Global collaboration (study of cultural negotiation differences, and negotiating over different time zones and long distances) and project delivery systems (structure of the project participants) systems impact this combined model.

This research will build on prior research in the areas of collaborative negotiation and information technology investment evaluations in project-oriented organizations (Pena-Mora and Weber, 1997, Pena-Mora, Kennedy, and Wang, 1997, Pena-Mora and Wang, 1997). This research will expand and develop these theories further.

Four steps are proposed to develop a methodology for collaborative negotiation in the Tren Urbano project. The first step is to look at how information or reporting occurs. The second step is to identify what are the potential conflicts based on the structures of the reporting described in step one. The next step is to detect how can these conflicts be resolved using collaborative negotiation. The last step is to investigate how information technology can be used in any of the above steps. This process will take two years. The first two steps described above will be worked on the first year, and the second two steps will be developed the second year.

Objective:

This research proposes to identify and monitor the areas of potential conflicts among the parties involved in the Tren Urbano project in San Juan, Puerto Rico. These areas will be studied with the aim to maintain a collaborative attitude during the negotiations of conflicts. Thus, the research will develop a model to support conflict resolutions based on collaborative methodology taking into consideration the current delivery system among other things. Possible new delivery systems for extensions will also be investigated, which may reduce conflicts or maintain a collaborative attitude during negotiations.

Research:

To maintain a collaborative attitude during negotiations of conflicts, four major areas needs to be addressed: how information or reporting occurs, how conflicts are detected, how the conflicts can be resolved, and how information technology can be used in any of the above. The four major areas shown in figure 1 and are described in more detail below.

1. Data collection on information and structures	2. Identify Conflicts	3. Resolve conflicts using Collaborative Negotiation
4. Utilize information technology for more efficiency and usefulness		

Figure 1. Four major areas for research in collaborative negotiations

1. *How is data exchanged among the different contractors, construction management team, the PRHTA, and all other parties involved?*

First the following structures and information/work-flow will be identified and modeled,

- Change orders
- Design approval/Review
- Design changes
- Schedule changes
- Budget changes

These processes will be studied in order to identify all parties involved in each process as well as what type of relationships exist with each activity. Who makes the critical approvals for each change, needs to be identified. When studying these processes some related questions may arise, which need to be addressed. Such questions include: Who develops the project overall schedule/revised schedules? Who relays lessons learned? Does an organization receive notification when its activities are affected due to another organizations change approvals?

2. *Identify potential conflicting issues.*

Based on the structures identified above, several potential conflicts may be identified. Such conflicts may include how the alignment contractors/system contractors are integrated and how changes in the schedule affect other parties/contractors. The delivery system may be evaluated to see if it is the most efficient, and if it minimizes the number of conflicts?

3. *How can the affected parties resolve these conflicts using collaborative negotiation?*

Collaborative negotiation will be used to optimize solutions and yield more satisfaction with the conflict solutions. The impact of the delivery system on negotiations needs to be clearly understood in developing the collaborative negotiation model. Different systems change the methodology of negotiations. Does this delivery system minimize potential for conflicts? How can these conflicts be managed more efficiently with the delivery system already in place? Can the same negotiation model used during the construction phase and be used in the operations and maintenance phase? Can this model be used if and when the operations and maintenance is transferred to PRHTA?

4. *How can information technology be used in any of the above and how efficient and useful is it?*

The value of IT to Tren Urbano needs to be evaluated. Siemens already have their internal IT system. Perhaps a system can be developed and used for all parties included in the Tren Urbano project. In that case, who should pay? Who will receive the benefits? In other words, how are the cost/benefits allocated? How can computers be utilized in negotiations to support a more efficient process? What is the level of IT investment in the Tren Urbano project? Is this the optimal level? How can over-investment in traditional production factors and over-investment in IT be avoided? When the project goes into the operations and maintenance stage, is IT diffused adequately?

Further questions:

During the study of the four major areas listed above and upon their completion, there are some more issues that need to be addressed in order to make collaborative negotiations work more efficiently and reduce future conflicts.

When the organizations involved in a project cross international borders, differences in cultures and approach to negotiations further complicate conflict negotiations. This is considered global negotiations. In the Tren Urbano project several firms are based outside Puerto Rico. Will all negotiations take place in Puerto Rico, or will they be done from home offices? Differences in cultures and styles of negotiations could be identified and their impact on negotiations could be studied.

As Tren Urbano needs to add extensions on the proposed train route, more contracts are to be awarded and a new organizational structure could be developed. Perhaps Siemens or equivalent should have more control over alignment section contractors. Or maybe the extension contracts should be organized completely different. This new delivery system should be developed to minimize potential conflicts and yield more satisfaction with the negotiated solutions.

Summary:

To reduce the number of conflicts, avoid a hostile environment, resolve the conflicts the cheapest and quickest, to provide more accurate decisions, and obtain more sustainable solutions, collaborative negotiation is introduced. This research is divided into four major areas. The first area is to collect information on data exchange and information flow. Based on this, the potential issues will be identified. Then, collaborative negotiation will be used to resolve these conflicts. Finally, the use and efficiency of information technology in any of the above will be evaluated.

References:

Pena-Mora, F., and Weber, T., (1997). *Information Technology Strategy in the Province of Mendoza: Case Studies and Modeling Framework*.

Pena-Mora, F., Kennedy, J., and Wang, C., (1997). *A collaborative Negotiation Methodology for large Scale Civil Engineering and Architectural Projects*.

Pena-Mora et. al (1997). Computer-Supported Collaborative Negotiation Methodology.