

THE GEORGE WASHINGTON UNIVERSITY

**A DECISION MODEL:
SELECT THE MOST IMPORTANT ACTIVITIES FOR IMPROVEMENT OF PROJECT MANAGEMENT
FOR IBM**

SCHOOL OF BUSINESS AND PUBLIC MANAGEMENT

BY

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CONTENTS

CHAPTER

1.	INTRODUCTION.....	1
2.	STRUCTURE	2
	<i>Project Goal</i>	2
	<i>Alternatives</i>	2
	<i>Objectives</i>	6
3.	MEASUREMENT	10
4.	SYNTHESIS.....	11
5.	RECOMMENDATIONS.....	14
6.	BIBLIOGRAPHY	15

Chapter 1

Introduction

Prediction is very difficult, especially about the future.

– Neils Bohr.

In IBM as in any other service delivery companies, projects and programs are serious endeavors undertaken to support the development of a new offering to provide outsourcing services — or more broadly defined: to implement a business transformation leading from an “as is” to a “to be” state (see Figure 1). What makes each project different is the degree of change and the time (represented in Figure 1 as the slope of the red line) from the “as is” state to reach the desired “to be” state. This forces rigorous defining and planning of what will have to be achieved and the application of formal controls to reach the to-be state on schedule and within budget.

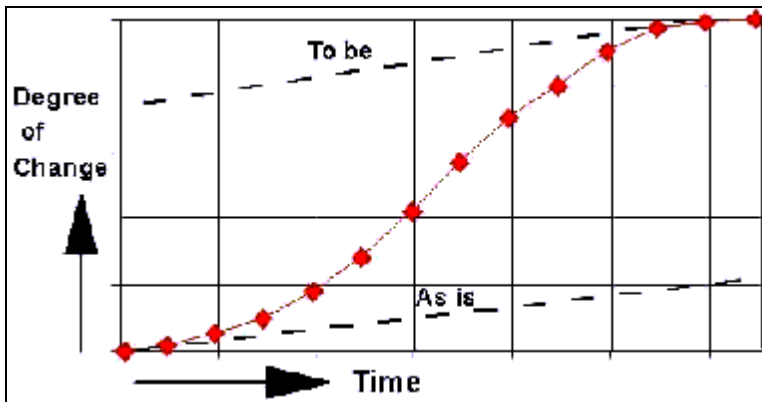


Figure 1

The risk of troubled projects needs to be managed since they have the potential to have a significant impact on IBM's profitability as well as a far-reaching negative impact on IBM's reputation for high customer satisfaction and quality service. But, what activities would be best to focus on to reduce the risk of troubled projects? This choice is a very important project/ model for both of our organizations within IBM where we have support from our Project Manager and Direct Manager to be participants during our modeling process and use the findings and results.

To assist IBM project management in identifying the most preferable activities to improve to reduce the risk of troubled projects, we will be using the Analytic Hierarchy Process (AHP) model of structuring the alternatives and objectives of the decision, measuring pairwise judgments to derive preferences of the participants for the alternatives and measure the objectives' significance, and synthesizing the preference decisions into overall priorities of the alternatives with respect to identifying the most preferable activities. From this synthesis, the participants can make a decision – or, the structure of alternatives and objectives can be revised and the process of measuring and synthesis repeated.

Chapter 2 Structure

Project Goal

Project Management is a key component of IBM's ability to deliver its commitments to the marketplace. Applying the disciplines inherent in project management allows us to successfully meet our commitments to our customers, budget and profit objectives. The goal of this project is to select the most effective *activities* for improvement of managing projects in IBM.

A test group of different project managers within IBM in charge of internal, transition and engagement projects have shown great interest to explore the possibilities offered to utilize Expert Choice[®] software to create a decision model that will provide a common approach and understanding to identify the most preferred activities for improvement of managing all IBM projects to reduce the risk of troubled projects. The benefits of using a common approach for improvement across IBM projects include easier transition of skilled project management professionals from project area to project area, and the opportunity for project managers to improve their performance by sharing ideas and experience.

Following the priorities derived for alternatives through AHP decision modeling using Expert Choice[®] software, the project manager and other key stakeholders will be able to lay out the basic shape and strategy of improvement in an orderly way.

Alternatives for the Best Activities to Improve Project Management at IBM

Projects have the highest risk of failure when there is some basic misunderstanding in the early Defining and Planning stages (for example, a mismatch between the business need and the scope defined). The priorities of alternatives derived through AHP decision modeling using Expert Choice[®] software will become the basis of improvement of the IBM Project Management Process. This Process provides a simple methodology that defines the minimum framework for successfully managing all IBM projects to ensure that:

- Each project is based on a good business justification based on a good understanding of the customer needs.
- The project shape, scope and objectives are understood and documented before detailed plans are drawn up following project control plans and contract development.
- A detail engagement process is used, in which the objectives of the project and shape of the project are established.
- A comprehensive Project Management System is defined and implemented before significant effort is expended on the project based.
- Appropriate management approvals and funding are granted at key checkpoints in the project.
- Project cost estimates and the budget are well defined.
- The project team organization structure and roles/ responsibilities are well defined.
- Initial project risk is assessed and planned for.
- The plans, controls, customer assessments are used to execute and manage the project as project development and delivery work is performed.

Alternatives were delineated based on reviewing and analyzing IBM project successes and failures from our Project Manager test group's input, identifying some of the most common problems and specific prevention measures which should be considered to reduce or contain risks that would effect quality, profitability and/ or customer satisfaction. The number of alternatives was then intentionally limited to be between 5 and 9 of the best choices identified due to known human cognizant limitations. Following is a more detail explanation of each one of the alternatives identified (see Figure 2) for the improvement of the Project Management Process.

<p>Improved Contract Development and Project Control Plans/ Templates</p> <p>Readiness Assessment with Customer</p> <p>Subcontractor Management Program</p> <p>Improve Project Manager Skill/ Experience</p> <p>Improve Funding Plan</p> <p>Document and Use a Detailed Engagement Process</p> <p>Better Understanding of Customer's Business Needs</p> <p>Improve Project Cost Estimating Accuracy</p> <p>Develop Risk Matrix with Contengencies</p>
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Figure 2 - Alternatives as Shown in Expert Choice Expert[®]

IMPROVED CONTRACT DEVELOPMENT AND PROJECT CONTROL PLANS/TEMPLATES

Contracts such as Statements of Work or Documents of Understanding need to be developed with careful consideration for type (for example, a fixed price contract) and service definitions. Some prevention measures can be the following:

- Limit Fixed-price engagements to short, relatively simple projects or phases or the misunderstanding often becomes extremely contentious when additional costs or schedule delays are involved. Disagreements as to requirements often result in customer dissatisfaction and IBM delivering a solution it did not intend to deliver.
- Decline to bid on a project if there is inadequate time to prepare a quality proposal. Both IBM and the customer are not served by developing a deficient proposal. It is better to decline to bid, than to submit an embarrassing or unprofitable proposal. Preparing a quality proposal takes time. Make sure the customer understands that it is to their benefit to allow adequate time to prepare a proposal.
- Involve Service Line Leaders/ specialists in developing the solution.
- Obtain agreement on scope and approach first, before estimating the effort.
- Review proposed contracts internally with management, assurance, finance and legal as appropriate before they are presented to the customer. Assurance and experienced staff can identify and suggest removal or rewording of parts of a proposal, which may have a negative impact on IBM. When a customer sees something that is beneficial to them in a proposal, it is very difficult to change or remove it in the future.

READINESS ASSESSMENT WITH CUSTOMER

In some cases the customer does not have the skill, resources, infrastructure or time to support the implementation of IBM's proposed solution. As a result, the project falls behind schedule; IBM may be required to assume customer responsibilities and/ or the project may not proceed as planned.

The best way to avoid misunderstandings between IBM and the customer regarding IBM's proposed solution is to have a "walk-through" of the requirements. Alternatively, the first phase of the contract could be designed as a requirements validation and solution review phase. It is extremely valuable both to the customer and IBM to avoid costly and frustrating misunderstandings of both sides by jointly reviewing the requirements validation and solution review phase. It is extremely valuable both to the customer and IBM to avoid costly and frustrating misunderstandings on both sides by jointly reviewing the requirements. The customer should understand that it is to their advantage to go through this process so they can ensure that IBM understands their requirements.

Simply exchanging requirements documents and responses between IBM and the customer for review is no substitute for up-front, joint walkthrough. In many cases, the RFP process does not permit detailed requirements review meetings prior to proposal submission. In these cases, IBM should try to persuade the customer to allow IBM to validate the requirements and proposed solution with the users upon contract award. Misunderstandings are usually identified and resolved when the detailed solution is discussed.

During the marketing discussions and in the IBM cover letter and proposal, state that IBM recommends a joint walk-through of the requirements, the Statement of Work and solution description before the contract is signed. Experience has shown that this task is necessary to minimize any misunderstandings between IBM and the customer.

SUBCONTRACTOR MANAGEMENT PROGRAM

Many of IBM's proposed solutions are dependent on the performance of key subcontractors.

When IBM signs a contract with a customer, IBM is on the line to deliver regardless of whether the subcontractor can ultimately deliver. Some Prevention Measures are the following:

- Thoroughly check references of the sub for this type of solution.
- Review the subcontractor's detailed project and staffing plans.
- Require sub to provide detailed status reports and issue logs.
- Monitor performance of sub closely.
- Allow for resources, money and the time in the schedule to review and correct the sub's work product before delivery to client.
- Add schedule buffer to the customer contract to cover for delays and corrections in the subcontractors work.
- Develop a contingency plan for alternative resources and methods to backfill the sub in case of default.
- Require a performance bond.
- If customer requires IBM to use a particular subcontractor, IBM should try to include a clause, which allows IBM to terminate the contract if the subcontractor is unable or unwilling to complete its responsibilities.
- In some cases, it is prudent to review certain contingency plans with the customer to get agreement on the backup strategy and approach.

IMPROVE PROJECT MANAGEMENT SKILLS AND EXPERIENCE

For Project Managers, improve organizational and leadership experience, resource contact, role definition, ability to coordinate a diverse resource pool, communication and procedural skills, ability to delegate and monitor work, and dependability.

A successful project manager knows how to bring together the definition and control elements and operate them efficiently.

- Organizational and leadership experience. An executive seeking a qualified project manager usually seeks someone who has already demonstrated the ability to organize work and to lead others. He or she assumes that the project manager will succeed in a complicated long-term project primarily because the project manager has already demonstrated the required skills and experience.
- Contact with needed resources. For projects that involve a lot of coordination between departments, divisions, or subsidiaries, top management will look for a project manager who already communicates outside of a single department. If the project manager has the contacts required for a project, it will naturally be assumed that will be a perfect fit.
- Ability to coordinate a diverse resource pool. A capable project manager should be able to delegate and monitor work not only in areas familiar to his or her own department but also in areas that are required.

- Communication and procedural skills. An effective project manager will be able to convey and receive information to and from a number of team members, even when particular points of view are different from his or her own.

IMPROVE FUNDING PLAN

If there is a previous successful base of experience with a particular solution implementation, a fixed-price contract may be profitable. However, in cases where we do not have experience implementing a particular type of solution, the projects are often underestimated in terms of both costs and schedule. Thus, many fixed-price projects result in unprofitable engagements and customer dissatisfaction.

Many projects have been financially doomed from the beginning as a result of underestimating the effort required to complete the project.

Although Assurance helps provide a certain level of validation, utilizing independent technical resources to validate the estimates is key to reducing the risk of underestimating the project effort.

Some prevention measures are the following:

- Involve the actual performance personnel in either the development or validation of the estimates during the proposal or at the contract start.
- In addition to Assurance reviews, technical reviews should be conducted to validate estimates and schedules.
- Use the most appropriate estimating tools available.
- Utilize experienced staff to validate the estimates.
- Make adjustments for the learning curve of new development tools and methodologies, systems management efforts, untested hardware and software components, subcontractor underestimates and unknown risks.

DOCUMENT AND USE OF A DETAILED ENGAGEMENT PROCESS

A structured approach to customer engagements should be consistently used (such as the Service Request tool, Engagement Process, or QA review).

- Include experienced services perform resources early in the discussions with the customer regarding the potential solution. Because of inexperience and/or a desire to win business, IBM representatives have had a tendency to underestimate the complexity, costs and time required for solutions. IBM representatives should be conservative in describing a project. Avoid the tendency to "over promise and under deliver"
- At the beginning of a project, document with the customer their expectations and priorities. This can be done in a simple Customer Satisfaction Plan. Once the expectations and priorities are established, the project team should list actions, which will be taken to meet those expectations. Documenting the customer's expectations and priorities accomplishes the following:
 - It reduces the chance of misunderstanding between the IBM project team and the customer
 - It forces the various people within the customer organization to reach a consensus on their sometimes-conflicting expectations and priorities.

BETTER UNDERSTANDING OF CUSTOMER NEEDS

There have been situations where IBM had clearly understood the customer's requirements. However, IBM's solution was not how the customer wanted its requirements met. There are often many different approaches and technical solutions (often with significantly different costs) which meet particular requirements. Some solutions are acceptable to a customer and some are unacceptable to the customer even though they technically meet the requirements. To avoid costly disputes, the customer should have

a clear understanding of IBM's proposed solution and how it meets their requirements. If the contract has already been signed, resolving a misunderstanding often becomes extremely contentious if additional costs or schedule delays are involved.

- Set appropriate customer expectations. If new or untested components are to be integrated as a part of the solution, the customer understands that there may be risks of delays in the integration effort. If a customer wants 100% assurance of a fit, then a fully tested solution of standard available products should be proposed.
- Conduct due diligence by modeling and testing the components to validate that they will work in the target environment.
- Be prepared to propose an alternate solution if the components do not integrate as expected.

IMPROVE PROJECT COST ESTIMATING ACCURACY

Unless the scope of an engagement is defined in detail with very accurate estimates (by an experienced project team), the chances are slim of a fixed-priced contract completing on time and within budget. Factors that influence estimating accuracy include:

- Understanding of Project team's level of experience.
- Identification and management of untested components in new environments.
- Detailed specifications to guide development or service delivery.
- Anticipating technical glitches (unknown "unknowns").
- Complexity of multi-phase projects.
- Built-in margin for conflict of interests.

Managing change and scope can be extremely difficult when the customer's requirements serve as the baseline. If the requirements serve as the technical baseline and IBM discovers that it must develop a different solution than it originally priced, IBM has no basis to go back for a change order if the requirements have not changed.

If IBM's proposed solution serves as the technical baseline and it is decided that a different solution should be implemented, IBM can then issue a change order to cover any additional costs incurred as a result of the new approach.

DEVELOP RISK MATRIXES AND CONTINGENCIES

All projects involve some risks. The risks should be understood and planned prior to beginning a project. Both technical and business risks should be addressed. Many risks can be avoided or reduced once identified with the following actions:

- Before beginning a project, be sure to identify all major risks and what the contingency plans are with respect to the risks. When appropriate, get the customer to acknowledge the risks and, if possible, agree to the contingency plan. If they have a problem with IBM's approach, the issue should be resolved earlier rather than later.
- Strongly encourage the customer to budget for changes up-front so the customer will have the flexibility to address their changing requirements without seeking additional internal funding. Change is a reality on nearly every project and the customer's expectations regarding change should be set early on. Discuss the fact that changes will probably occur.

Objectives/ Sub-objectives

A decision hierarchy (see Figure 3) containing IBM's Project Management Objectives was derived through interviews with IBM managers. The three main groups of project areas within IBM were delineated to form three distinct objective areas: *internal* – small (less than \$10M), *engagement* (internal – large or external customer-related project initiation), and *engagement transition*. Albeit these areas' projects have different processes and methods for management, they are all measured on the basis of

the “Triple Constraint” of schedule, cost and scope. The triple constraint forms the sub-objectives in our Expert Choice© Model.

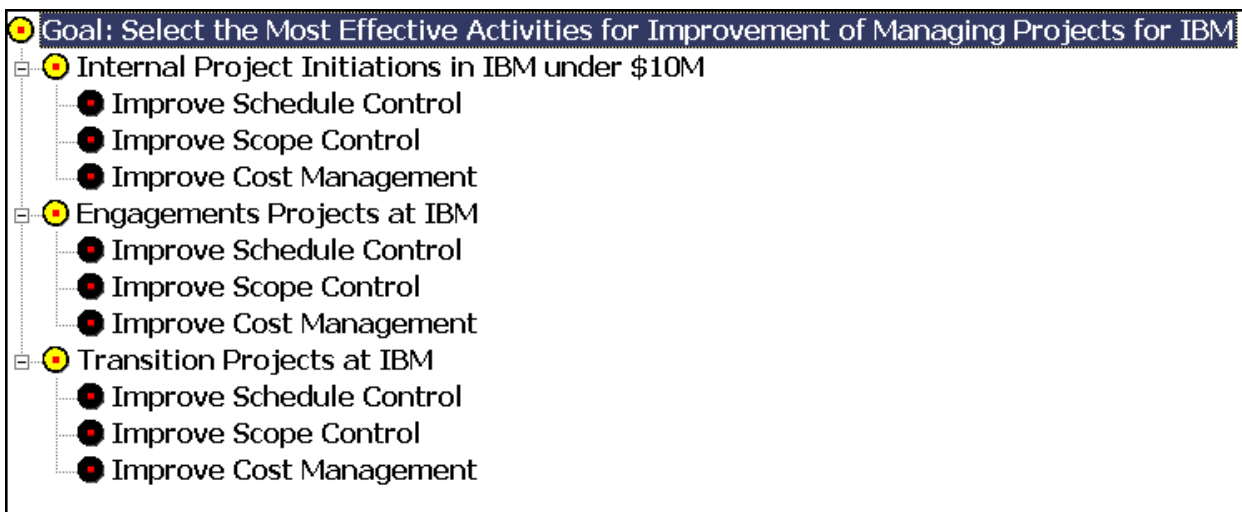


Figure 3 - Objective Hierarchy as Shown in Expert Choice

Following is a more detail explanation of each one of Objectives and Sub-Objectives.

INTERNAL PROJECTS IN IBM

On a project where both the sponsor and the customer are internal to IBM (an may be the same person or organization), the agreement often consists of a document of understanding (DOU) to describe the details of the relationship.

The relationship between an internal sponsor and the delivery organization can be portrayed as in Figure 4 below.

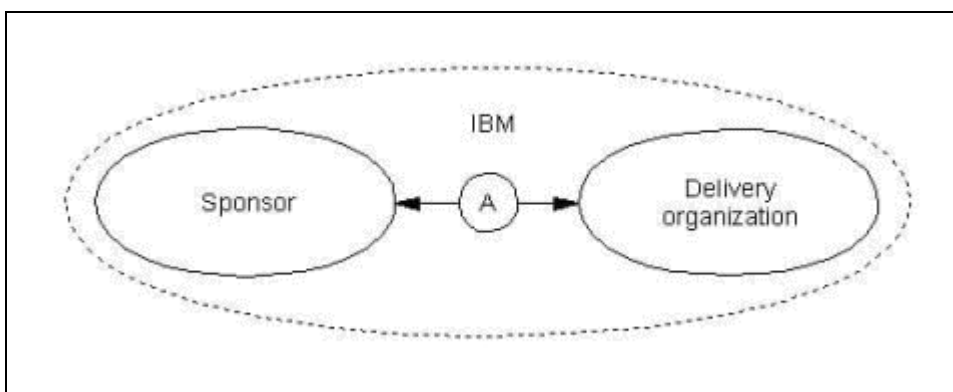


Figure 4 - Internal Projects

ENGAGEMENT PROJECTS IN IBM

A project is initiated when a sponsor in IBM asks a delivery organization to help respond to a business need. A project charter supports the request where the sponsor documents objectives and requirements for the project.

For example, the agreement on a project for a sponsor external to IBM, such as the one shown in the following diagram, is typically a legal contract, consisting of terms and conditions, as well as a statement

of work that describes the project in some detail. In this type of project, the term client is often used to describe the role of the customer (recipient of a product or service), who may or may not be the same as the sponsor.

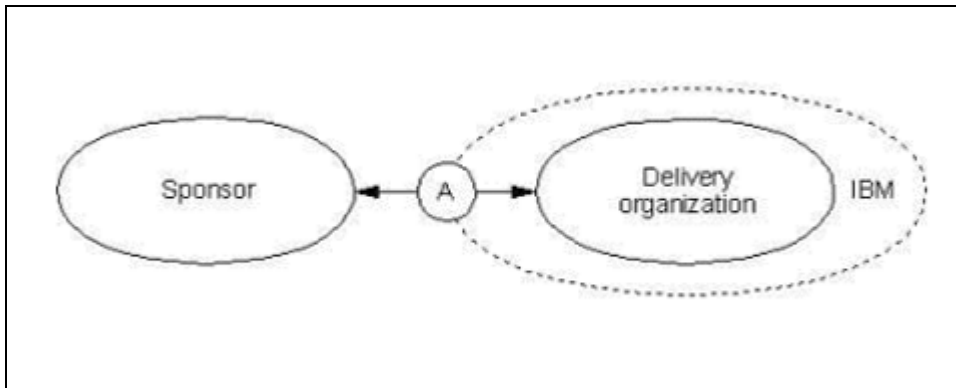


Figure 5 - Engagement Projects

TRANSITION PROJECTS IN IBM

The delivery organization may be assisted by one or more performing organizations that execute project, projects and services within program. These performing organizations can be internal to IBM or may be subcontractors.

A subcontractor is one of the three types of supplier, which are:

- Vendors, who provide “off the shelf” products or packaged services
- Staff providers, who provide human resources to the project but do not manage their work
- Subcontractor, who take part directly in the achievement of the project. The delivery organization, which retains responsibility for meeting the terms of the agreement with the sponsor, manages the relationship with its external subcontractors via agreements, as shown in Figure 6 below.

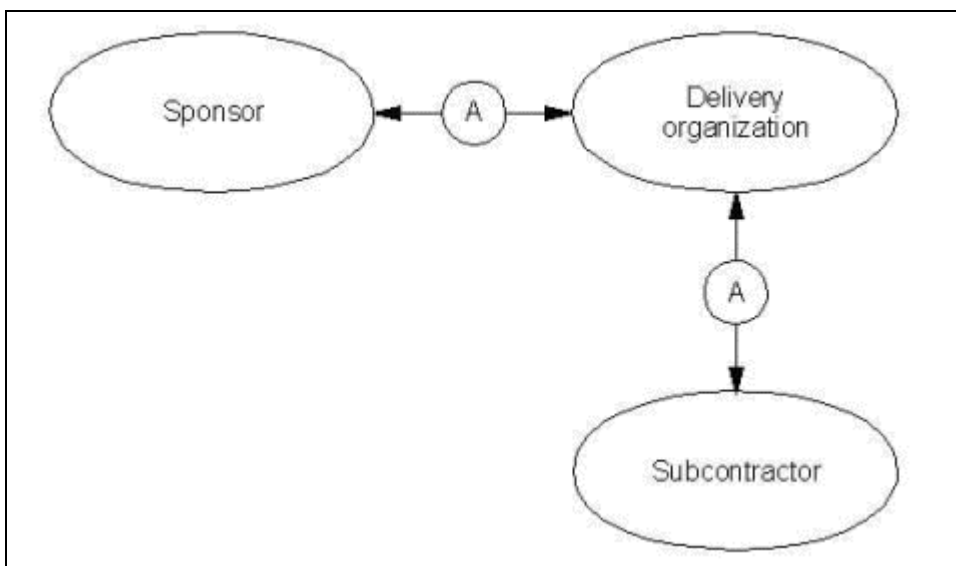


Figure 6 - Transition Projects

All projects must operate under the three constraints of *schedule*, *cost*, and *scope*. Projects succeed or fail purely on the basis of these three sub-objective areas as follows:

- **Scope Control.** Completion of a specific, defined task or a series of tasks is the primary driving force behind a project. Unlike the recurring tasks faced on the departmental level, a project is targeted to the idea of a finite, one-time result.
- **Cost Management.** A project's budget is often separate from the departmental budget. Unlike a department's staff, a project team operates with a degree of independence in terms of both control and money. Project teams often include people from several different departments; thus, budgetary control cannot be organized along departmental lines. A project may require a capital budget as well as an expense budget. As project manager, we are likely to have a greater degree of control over variances.
- **Schedule Control.** Projects have specific starting points and stopping points. A well-organized project is based on careful controls over competition phases, which involve the use of team members' time.

Chapter 3 Measurement

Each participant in our test group of 9 project managers (see Figure 7) was asked to evaluate the relative importance of the alternatives with respect to the objectives and sub-objectives, and each objective and sub-objective with respect to the goal based through pair-wise comparisons.

1	Combined	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2	Clifford Zwart	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ray Johnson
3	Carla Restovic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Phillis Reece
6	Christopher Clark	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ray Johnson
8	Norman Miller	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tim Smith
9	Richard Larson	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tim Smith
10	Bob Schelett	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tim Smith
12	Emma Carrejo	<input type="checkbox"/>	<input checked="" type="checkbox"/>	El Paso Independent School District
13	Lisa Freedman	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ray Johnson

Figure 7 - Participants as Shown in Expert Choice®

These comparison decisions were performed verbally (see Figure 8), deriving ratio scale priorities that were subsequently combined. A result of verbal comparisons is shown in Figure 9.



Figure 8 - Verbal Pairwise Comparison Example

Improved Contract Development and Project Control Plans/ Templates
Readiness Assessment with Customer
Subcontractor Management Program
Improve Project Manager Skill/ Experience
Improve Funding Plan
Document and Use a Detailed Engagement Process
Better Understanding of Customer's Business Needs
Improve Project Cost Estimating Accuracy
Develop Risk Matrix with Contingencies

Figure 9 – Result of Verbal Comparison Example

Chapter 4 Synthesis

Synthesis works by adding up the ratio scale priorities derived from pairwise decisions to determine those Alternatives that are more preferable for improving project management in IBM. Combined results of the derived individual priorities provided the information for final synthesis.

As shown in Figure 10 below, the derived combined priority for most preferred *area* for improvement is Engagements Projects. This is most likely because of the large size and greater financial risk presented by Engagements Projects.

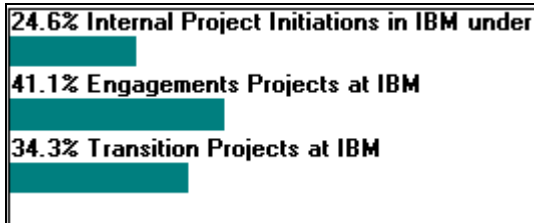


Figure 10 - Derived Priorities of Objectives

From the figure below, the highest priorities for *activities* overall derived from synthesis of the ratio scale priority values from pairwise comparisons are Improved Contract Development and Project Plans/ Templates, Better Understanding of Customer's Business Needs, and Readiness Assessment with Customer (see Figure 10).

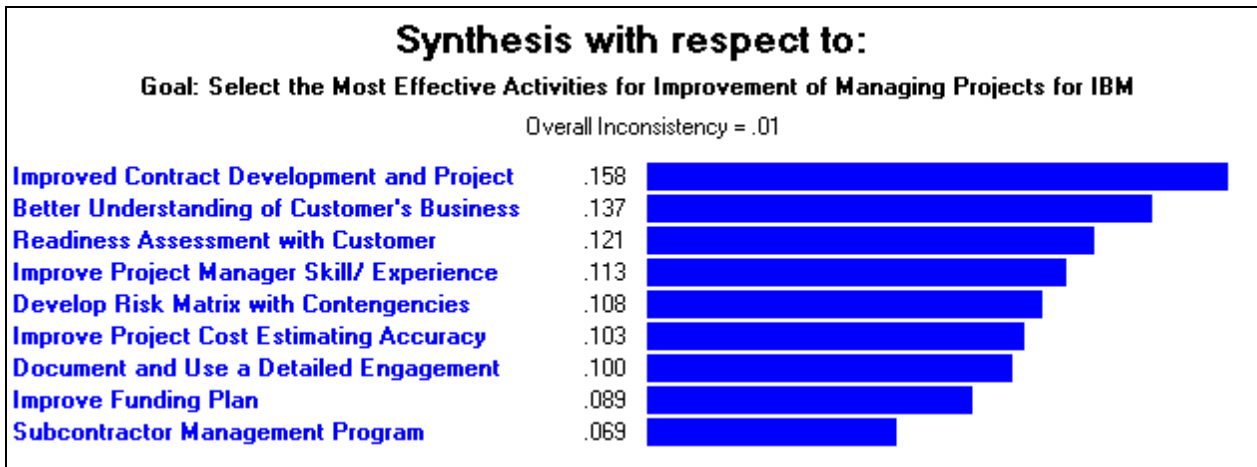


Figure 11 - Derived Priorities of Alternatives

Improved Contract Development and Project Plans/ Templates has the overall highest preference (see Figure 11). However for Engagements Projects Better Understanding of Customer's Business Needs has the highest preference.

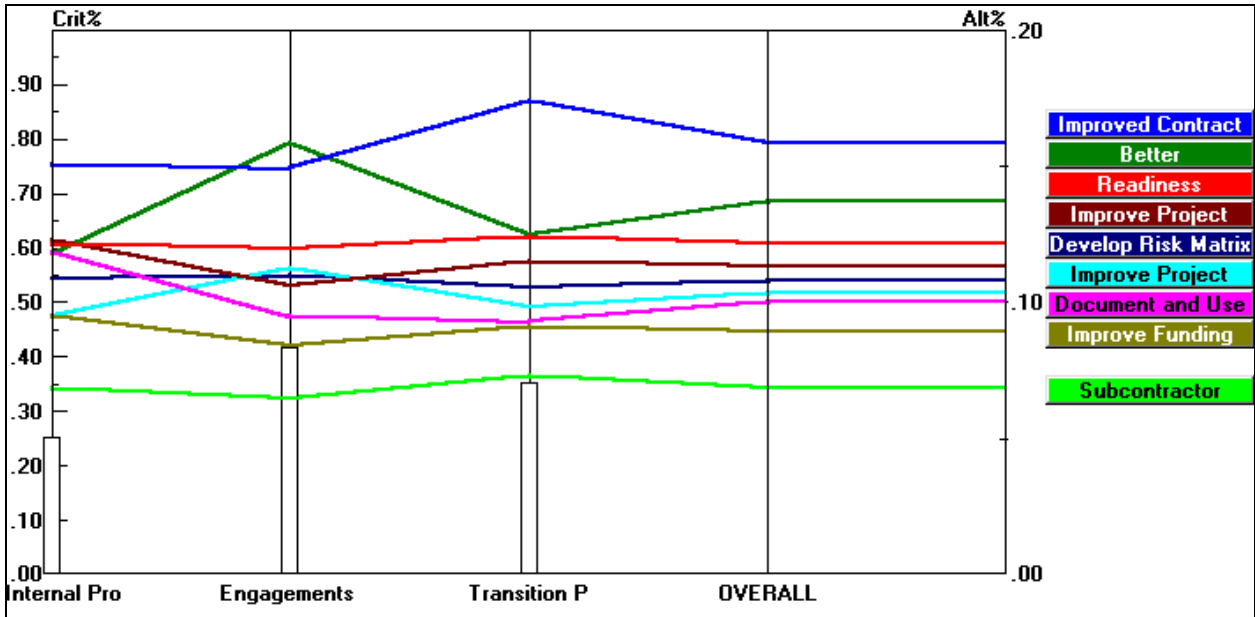


Figure 12 - Performance Sensitivity Chart

Therefore, as the priority of Engagements Projects increases, the priority of Better Understanding of Customer's Business Needs increases to overtake Improved Contract Development and Project Plans/ Templates as the overall most preferred alternative (see Figure 12):

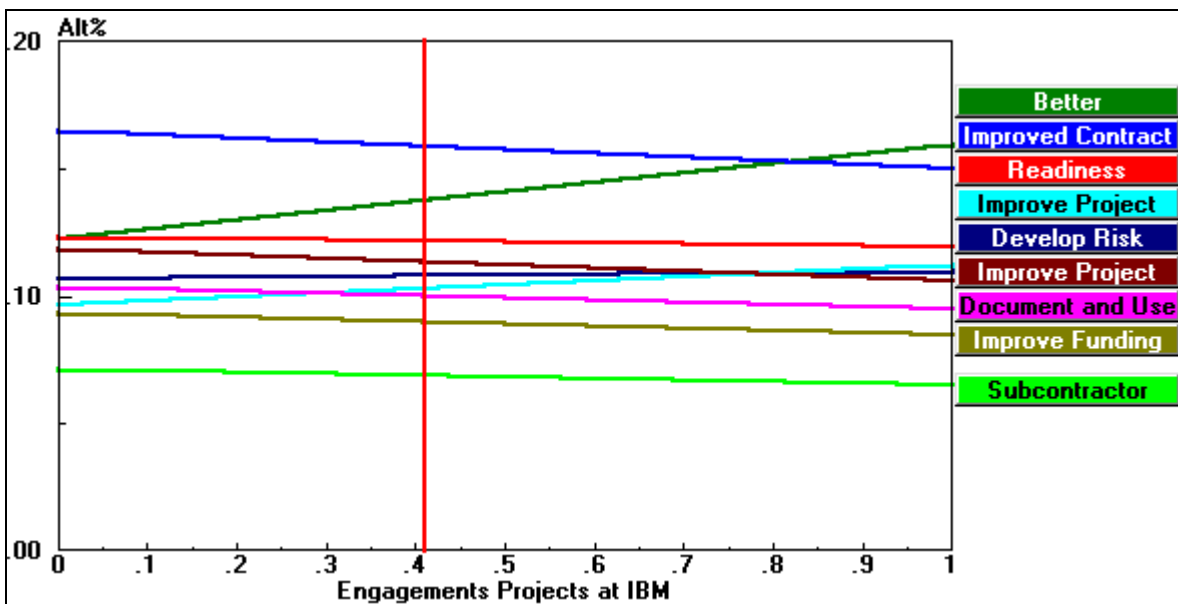


Figure 13 - Gradient Sensitivity Chart for Engagements

If the priority of Transition Projects increases, however, the priority of Better Understanding of Customer's Business Needs decreases (see Figure 13):

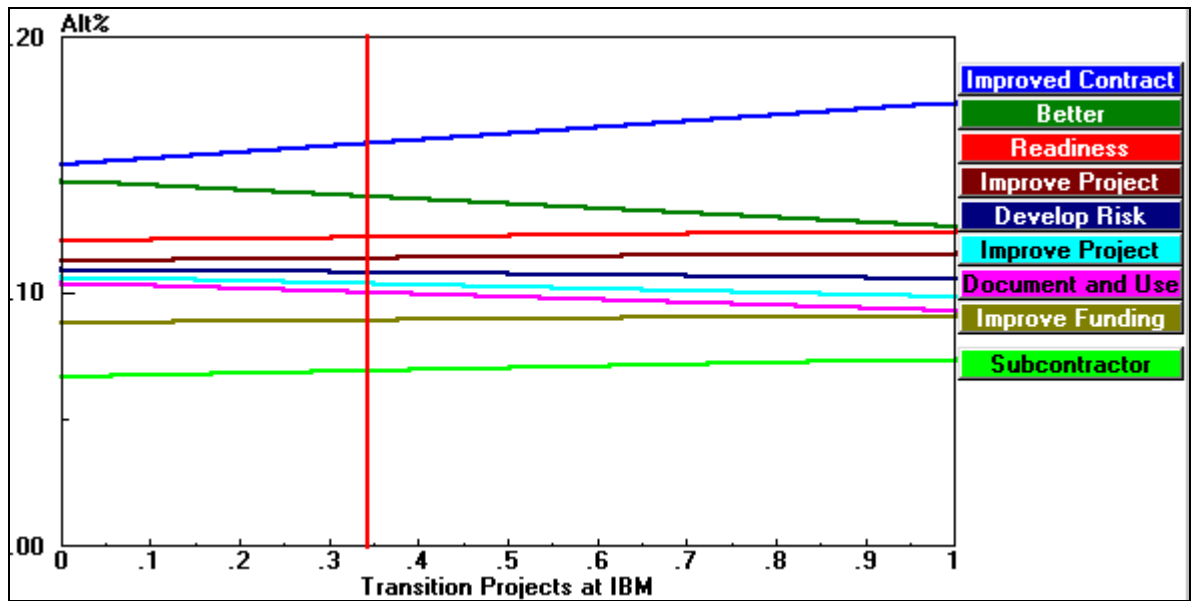


Figure 14 - Gradient Sensitivity Chart for Transition Projects

Chapter 5

Recommendations

Improved Contract Development and Project Plans/ Templates and Better Understanding of Customer's Business Needs are the most preferred activities for improvement for project management to reduce the risk of troubled projects in Internal, Engagements, and Transition project areas at IBM. We recommend that focus be given to these two activities first. If time and resources permit, a Readiness Assessment with Customer process should be considered.

We plan to share these findings and results with our test group and obtain feedback for future use of the Model. A resource allocation model will be suggested to delineate the best combination of alternatives within a given budget.

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