

# SETTING UP A REMOTE OUTPOST IN A DISTRIBUTED IT ORGANIZATION

by

Darko Bajkin

B.Sc. Electrical Engineering, Military Technical Academy, Belgrade, Yugoslavia, 1993  
Graduate Diploma in Business Administration, Simon Fraser University, Burnaby, BC, 2003

PROJECT SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION

In the  
Faculty  
of  
Business Administration

Executive MBA

© Darko Bajkin 2005

SIMON FRASER UNIVERSITY



Summer 2005

All rights reserved. This work may not be reproduced in whole or in part,  
by photocopy or other means, without permission of the author.

# APPROVAL

**Name:** Darko Bajkin

**Degree:** Master of Business Administration

**Title of Project:** Setting Up a Remote Outpost in a Distributed IT Organization

**Supervisory Committee:**

---

**Dr. Michael Parent,**  
Senior Supervisor,  
Associate Professor,  
Faculty of Business Administration

---

**Dr. Mark Selman,**  
Second Reader,  
Executive Director,  
Learning Strategies Group,  
Faculty of Business Administration

**Date Approved:**

August 9, 2005

# SIMON FRASER UNIVERSITY



## Partial Copyright Licence

The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the right to lend this thesis, project or extended essay to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further granted permission to Simon Fraser University to keep or make a digital copy for use in its circulating collection.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Dean of Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author's written permission.\

Permission for public performance, or limited permission for private scholarly use, of any multimedia materials forming part of this work, may have been granted by the author. This information may be found on the separately catalogued multimedia material and in the signed Partial Copyright Licence.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found in the original bound copy of this work, retained in the Simon Fraser University Archive.

W. A. C. Bennett Library  
Simon Fraser University  
Burnaby, BC, Canada

# SIMON FRASER UNIVERSITY



## Ethics Approval

The author, whose name appears on the title page of this work, has obtained human research ethics approval from the Simon Fraser University Office of Research Ethics for the research described in this work, or has conducted the research as a co-investigator of a project, or member of a course, approved by the Ethics Office.

A copy of the human research ethics approval letter has been filed at the Theses Office of the University Library at the time of submission of this thesis or project.

The original application for ethics approval and letter of approval is filed with the Office of Research Ethics. Inquiries may be directed to that Office.

W. A. C. Bennett Library  
Simon Fraser University  
Burnaby, BC, Canada

## **ABSTRACT**

Adding a remote outpost to the central IT organization has proven to be very difficult challenge. When adding a new remote site, issues related to physical boundaries, technology, organization, culture and establishing trust need to be accounted for. Also, the modified organization needs to be put into the existing organizational context expressed through its strategic objectives. Before jumping into implementation, a strategic fit and a general economic analysis should be performed. Also, a communications framework between the central IT and the remote site resources and customers needs to be established. After the remote site needs are analyzed, a budget, scope and schedule need to be established. If the project is approved, collaboration and knowledge exchange frameworks need to be implemented.

This paper proposes the design and the sequence of the implementation process for adding a new remote site to the existing central IT organization.

## **DEDICATION**

To my wife Natasha and my two children Theodora and Luka for having the patience and understanding that completing the program takes time from our family life.

## **ACKNOWLEDGEMENTS**

I would like to acknowledge Alcan for providing financial support and for providing resources with their time and experience that helped me with the various assignments throughout the program.

Special thanks to SFU for organizing this program and for sending their best professors in order to provide quality education to a remote community like Kitimat.

Thanks to each and every one of the people that were doing this program with me and for their patience and understanding required when working with me on the various assignments.

Mojim i Natasinim roditeljima se zahvaljujem na podrsci izrazenoj dolaskom kod nas da nam pomognu za vreme trajanja ovih studija. Takodje se zahvaljujem nasoj braci Zeljku i Borisu i snajama Cvetanki i Ivani na strpljivosti pogotovo sto je ovo sve zahtevalo i od njih da zive bez roditelja i da se snadju sami za cuvanje dece.

# TABLE OF CONTENTS

<b>Approval.....</b>	<b>ii</b>
<b>Abstract.....</b>	<b>iii</b>
<b>Dedication.....</b>	<b>iv</b>
<b>Acknowledgements.....</b>	<b>v</b>
<b>Table of Contents.....</b>	<b>vi</b>
<b>List of Figures.....</b>	<b>viii</b>
<b>List of Tables.....</b>	<b>ix</b>
<b>Glossary.....</b>	<b>x</b>
<b>1 Introduction.....</b>	<b>1</b>
1.1 Alcan and APMG Overview .....	1
1.2 APMG IT Function.....	7
1.3 The Importance of the Remote IT Outposts .....	9
<b>2 Analysis of Issues Related to Distributed Organizations.....</b>	<b>13</b>
2.1 Physical Boundaries .....	13
2.2 Technology Issues .....	15
2.3 Organizational Issues.....	17
2.4 Culture as a Factor.....	19
2.5 Loss of Trust as a Factor .....	21
<b>3 Internal Analysis.....</b>	<b>23</b>
3.1 IT Organization Strategy .....	23
3.1.1 IT Strategy as Part of the APMG Strategy .....	23
3.1.2 Balanced Scorecard Methodology .....	24
3.1.3 Organizational Vision .....	26
3.1.4 Financial Perspective.....	27
3.1.5 Customer Perspective.....	27
3.1.6 Internal Perspective .....	28
3.1.7 Learning Perspective .....	29
3.2 How Do the Distributed Organization Issues Relate to the IT .....	29
3.2.1 Financial Perspective.....	30
3.2.2 Customer Perspective.....	31
3.2.3 Internal Perspective .....	33
3.2.4 Learning Perspective .....	34
<b>4 Fulcrum Analysis.....</b>	<b>37</b>
<b>5 Remote Site Addition: Implementation Analysis.....</b>	<b>42</b>
5.1 Strategic Fit and Economic Analysis.....	42
5.2 Acquisition Mode vs. Alliance Mode.....	45
5.3 Implementation Plan.....	52
5.4 Establishing Communications Framework.....	53



5.4.1	Communication Processes and Media.....	53
5.4.2	Addressing the Issues of Language and Culture .....	56
5.5	Remote Site Needs Analysis .....	57
5.6	Establishing Organizational Collaboration Framework .....	59
5.6.1	Stakeholder Analysis.....	59
5.6.2	Addressing the Issues during the Setup of the Collaboration Framework .....	62
5.7	Establishing Knowledge Exchange Framework.....	67
5.8	Managing Convergence and Divergence Cycles.....	69
5.9	Implementation of Managerial Controls.....	73
<b>6</b>	<b>Recommendations and Conclusion .....</b>	<b>75</b>
	Reference List .....	79

## LIST OF FIGURES

Figure 1-1 Alcan's business areas .....	3
Figure 1-2 APMG product line within the complexity grid .....	5
Figure 3-1 Balanced scorecard methodology .....	25
Figure 4-1 Collaboration processes hierarchy .....	40
Figure 5-1 Communication process hierarchy.....	54

## LIST OF TABLES

Table 1-1 Relevant Alcan financial data .....	6
Table 3-1 Financial perspective objectives .....	27
Table 3-2 Customer perspective objectives.....	28
Table 3-3 Internal perspective objectives.....	29
Table 3-4 Learning perspective objectives.....	29
Table 4-1 Collaborative processes requirements per perspective.....	40
Table 5-1 Acquisition or alliance - analysis results.....	51
Table 5-2 Organizational collaboration framework implementation issues.....	63

## **GLOSSARY**

<b>ACOC</b>	Aluminum Company of Canada, Limited
<b>Alcan business group profits</b>	Earnings before interest, taxes, depreciation and amortization
<b>APMG</b>	Alcan Primary Metal Group
<b>CPU</b>	Central processing unit or the computer microprocessor
<b>EHS</b>	Environment, Health and Safety
<b>IT</b>	Information technology
<b>ROE</b>	Return on equity
<b>SG&amp;A Costs</b>	Selling, general and administrative costs
<b>SLA</b>	Service level agreement

# **1 INTRODUCTION**

## **1.1 Alcan and APMG Overview**

In 1902, the Canadian subsidiary of the Pittsburgh Reduction Company (later Alcoa) was first chartered as Northern Aluminum Company, Limited. The company was renamed Aluminum Company of Canada, Limited (ACOC) in 1925. When Alcoa divested most of its interests outside the United States in 1928, Aluminium Limited was incorporated to assume control of most of these interests, and thereby became the parent company of ACOC.

The years 1930 to 1950 saw a great deal of expansion on the part of ACOC as smelting and hydroelectric facilities were built. Fabricating plants were also built in both Canada and the U.K., and sales offices began opening on an international scale. In 1945, ACOC registered the trade name Alcan.

Between 1960 and 1980, fabricated products capacity expanded internationally. Smelting operations started in Australia, the U.K., Brazil and India. Bauxite operations started in Africa, Brazil and Australia. In 1966, the parent company Aluminium Limited was renamed Alcan Aluminium Limited.

The 1980s brought a merger with British Aluminium plc and the acquisition of other aluminum sector assets in fabricated products. In 1987, the "corporate arrangement" resulted in ACOC changing its name to Alcan Aluminium Limited and becoming the publicly-owned parent company of the Alcan Group.

In the 1990s, corporate restructuring brought about the divestment of non-core assets. As well, Alcan Taihan Aluminum Limited was created to serve the growing Asian market. In 2000, Alcan significantly increased its presence in the packaging business and became the world's leading supplier of aluminium-based automotive products, lightweight engineered products and specialty packaging with its acquisition of Alusuisse. In 2001, the

company was renamed Alcan Inc. in order to reflect the Company's increasingly diversified product mix and global character (Alcan Corporate History, 2003, p.1). In 2003 Alcan completed the acquisition of Pechiney, to become a leader in aluminum reduction technology sales. At the beginning of 2005 Alcan divested its rolling products business which became Novelis.

Today, Alcan is a multinational, market-driven company and a global leader in aluminum and packaging. With world-class operations in primary aluminum, fabricated aluminum as well as flexible and specialty packaging, aerospace applications, bauxite mining and alumina processing, today's Alcan is well positioned to meet and exceed its customers' needs for innovative solutions and service. Alcan employs almost 70,000 people and has operating facilities in 55 countries and regions.

Alcan's main businesses are bauxite mining, alumina ore refining and sales, smelting, casting of primary aluminum and power generation, specialty packaging and engineering products for the automotive and the space industry (see Figure 1-1).

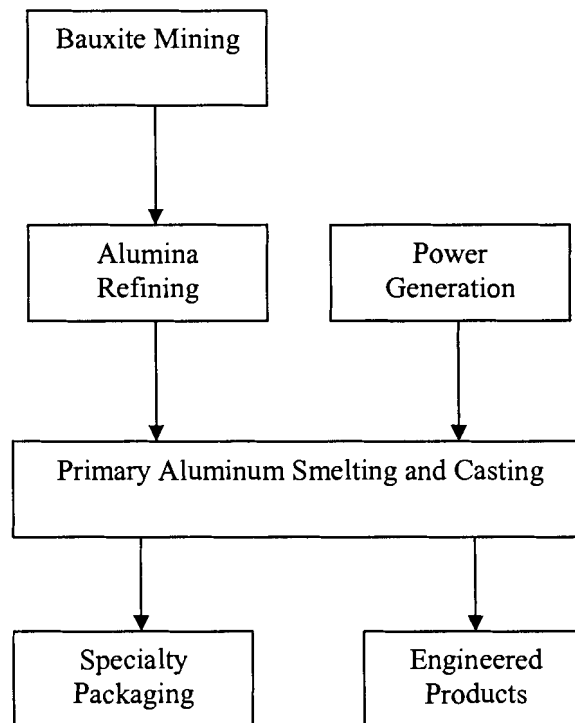
Alcan is a global leader in alumina production, as well as in the sale of technology and technical assistance for alumina processing. The Bauxite and Alumina group represents a global network of bauxite mines and deposits and alumina refineries, supplying Alcan's Primary Metal group and external customers with smelter-grade alumina in addition to producing specialty alumina for third parties.

Alcan is the second largest primary aluminum producer in the world, manufacturing commercial-grade ingot for sale in the primary metal market, in addition to developing value-added products for customers in the transportation, building and construction, consumer goods, and machinery markets. The Primary Metal Group includes all aluminum smelting facilities, power generation installations, technology, equipment sales and engineering operations, as well as anode production facilities and aluminum fluoride plants.

Alcan is a leading packaging provider, with a worldwide presence in specialty packaging which includes food, pharmaceutical and medical, beauty and personal care, and tobacco packaging.

Alcan's Engineered Products group is a world leader in fabricated aluminum and composite products for a broad range of applications. Examples of engineered products include large extrusions, rod, cable, and strip products, as well as the high value-added aerospace products. (Alcan Inc. 2004 Annual Report, 2005)

**Figure 1-1 Alcan's business areas**



*Source: Darko Bajkin based on Alcan Inc. 2004 Annual Report (2005)*

In 2004 Alcan introduced its Alcan Integrated Management System (AIMS) which focuses on interconnecting three of Alcan's corporate building blocks: Value-Based Management, EHS (Environment Health and Safety) First, and Continuous Improvement

(Alcan Inc. 2004 Annual Report, 2005, p.1). Value-Based Management program is financial in nature and its main goal is to double shareholder value every 5 years. Throughout Alcan every investment decision is being evaluated based on the value that investment is going to bring to the company. EHS First program addresses Alcan's long-term sustainability concerns. This program aims at ensuring sustainable operations by taking responsibility for the environment, and taking responsibility for the health and safety of Alcan's employees. Continuous Improvement program is concerned about operational efficiency and improvement of Alcan's competitiveness. Its main goal is to stimulate culture of making the improvements in the operations by continuously taking small and carefully planned steps. By integrating these three programs Alcan is targeting achievement of its governing objective – maximization of value (Alcan Inc. 2004 Annual Report, 2005, p.1). These programs enable Alcan's businesses access to tools for growth in the global competitive market and to consistently identify and capitalize upon new value-creating opportunities.

Alcan's largest business is the primary metal business. At the end of 2003 this business accounted for 20% of the total third party sales and 37% of the business group profits. At the end of 2004 the primary metal business group accounted for 17% of the third party sales and for 42% of the business group profits. The Alcan Primary Metal Group (APMG) is headquartered in Montreal, Canada and it comprises smelting operations, power generation, production of primary value-added ingot, manufacturing of smelter anodes and aluminum fluoride, technology sales, and aluminum trading operations. APMG is operating or has interests in 25 smelters in 13 countries (Alcan Inc. 2004 Annual Report). This paper will be focusing on APMG which essentially was the business Alcan has been built upon.

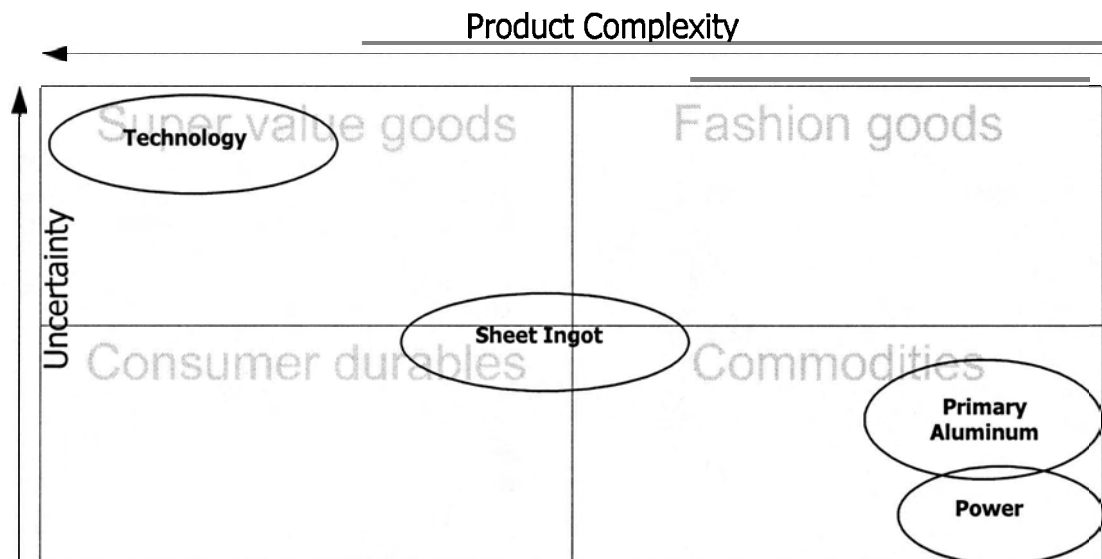
If we place APMG's main products in the complexity grid (Figure 1-2) we see that their types vary. For example, the pot technology is a super value good because the product complexity is very high as well as the market uncertainty that the pot technology as a product faces. Some secondary aluminum products such as the sheet ingot are consumer durables because of their medium to high complexity and their medium to low market uncertainty. The primary aluminum, some basic ingot types and power are commodities because those products are relatively simple to make and the market uncertainty is also very low. The



commodity products are being sold at spot market prices. The primary aluminum is a commodity because its price is being driven by the London Metals Exchange (LME).

Most of the APMG products' prices are linked to the price of aluminum. So is a large portion of the APMG's profits. Alcan's performance is also affected by the state of the US dollar compared to the local currencies in the countries where Alcan operates. Alcan's financial statements are reported in US dollars and majority of Alcan's businesses are located outside of the US. So, when the US dollar falls when compared to the local currency the revenues start to look smaller. At the end of 2004 a positive impact on Alcan's profits had the relatively high prices of aluminum (over US \$1,700 per tone). On the other hand, APMG's profits were negatively affected by the weak US dollar and by the higher prices of the raw materials which normally follow the trend set by the price of aluminum.

**Figure 1-2 APMG product line within the complexity grid**



*Source: Darko Bajkin based on Alcan Inc. 2004 Annual Report (2005)*

Globalization also has a profound effect on APMG's profits. As in other manufacturing sectors the competition in the aluminum industry has been increasing. APMG as a Western world company faces increased competition from rivals in developing countries. The increased competition, if we look back at the complexity grid, is pushing APMG's products downward and

to the right towards the commodities quadrant. Such pressures push APMG to continuously come up with new approaches for cost management.

One of Alcan's primary goals is to double shareholder value every 5 years, which would basically require an ROE of 15%. Recently, Alcan's ROE has been very low when compared with competitors. If we look at Table 1-1 we notice that the ROE has been low due to the asset impairment related major write-downs in 2001 and 2004. Still, even if we remove the effects of the write-downs the ROE stays low.

The gross margin has been decreasing while selling, administrative and general expenses have been trending upward. The SG&A costs are the so-called overhead costs. During the last four years these costs have been trending upwards.

**Table 1-1 Relevant Alcan financial data**

	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
<b>ROE</b>	8.55%	6.97%	0.02%	4.42%	1.58%	0.62%
<b>Adjusted ROE<sup>1</sup></b>	8.55%	6.97%	7.08%	4.10%	1.49%	7.75%
<b>Gross Margin</b>	22.24%	22.25%	20.99%	20.98%	20.81%	18.75%
<b>SG&amp;A Costs</b>	5.12%	4.43%	4.39%	4.64%	5.47%	6.48%

*Source: Alcan Inc. 2004 Annual Report (2005)*

The latest major acquisition of Alusuisse and Pechiney by Alcan resulted in adding more corporate overhead. Although this is one of the main reasons for the upward trend of Alcan's SG&A costs, a disciplined cost reduction will need to be applied to overhead functions that include human resources, finance, legal, engineering and IT. In order to support long-term programs such as the value maximization, continuous improvement and EHS First, Alcan as well as APMG will have to tackle the overhead costs.

As a result of the pressure to reduce overhead costs, the IT function, being one of the overhead functions, was centralized. The IT function services cover support, operations

---

<sup>1</sup> ROE adjusted for special items such as restructuring and asset impairment charges

planning, and project delivery related to Alcan's information technology infrastructure. The IT infrastructure includes the network, workstations, servers on the hardware side and the third party and in-house developed applications running on the hardware infrastructure. Its services currently cover the North American part of APMG. The goal of this paper is to analyze the issues related to the distributed aspect of the IT function and based on that analysis to recommend a process for adding more remote manufacturing sites to be supported by the central IT function. At the same time we will look at finding ways to improve the existing processes between the central part of the IT function and the currently supported remote sites.

## **1.2 APMG IT Function**

In order to address the challenges of lowering the cost of IT services and to enable the IT as a whole to add more value to APMG, the management has made two significant decisions: to centralize the IT organization and to outsource the IT help desk and basic infrastructure services.

Until the end of the 1990's APMG's IT organization was decentralized. Every smelter had an IT department that was responsible for all the decisions related to the applications and the infrastructure installed within those plants. At the same time, the smelters in Quebec were served by a central IT function that was responsible for the delivery of major projects. After the projects were delivered to the plants, the plant based IT departments were responsible to take over the maintenance of the new product, whether it was a new application or new infrastructure.

The IT function, including both its central part and the plant departments, provided four types of services to APMG: strategic planning, project delivery, operations and support. Support services include fixing things that are supposed to work, but do not seem to at the particular time. This includes hardware failures, software and application bugs and training related calls. Operations include backups, server monitoring, virus protection, and job

scheduling. Planning and development include developing new functionality or customizing or enhancing existing applications.

Support and operations activities are considered as maintenance related activities that do not add new value to APMG as a whole and cause IT to look like a cost center. On the other hand, the planning and project delivery activities add value to the organization because they enable APMG as a business to lower its long-term costs and to improve its competitive positioning. APMG management looked at the IT services breakdown and saw an opportunity to increase the IT function's ability to add more value to Alcan.

In order to enable the IT function to capitalize from the opportunity to increase its value-added activities a major IT function reorganization took place. First, all of the Canadian plants' IT departments were added to the central groups. The resources working for the IT function were organized around the application groups they were working with at the time. For example, the following groups were formed with the initial reorganization: manufacturing application group, administrative application group, office productivity application and infrastructure group, and help desk services group. One of the first steps in the implementation of the new organization was to standardize the IT architecture, in order to create a common application and infrastructure base. Standardization of the infrastructure was performed to minimize the amount of specialized knowledge and to free the resources to work on projects and planning activities.

After this partitioning of services, Alcan signed a 10 year, \$200 million outsourcing contract with CGI. At that point in time CGI and Alcan have had a working relationship for the past 20 years. The CGI solution was selected after a rigorous analysis of Alcan's IT requirements and after reviewing all alternatives. As specified within the contract, CGI is supposed to manage Alcan's help desk operations and provide user support data center management services as well as electronic messaging systems. These services were chosen to be outsourced because of their availability on the open market, as well as because those services were considered by Alcan as services that do not contribute to the company's overall value maximization objective. The contract specified that the CGI would serve Alcan's

operations in Quebec, British Columbia as well as some operations in the United States (Alcan Inc. Web Site, 2002).

Two years after the outsourcing deal with CGI, the pressure on the IT function to add more value to the organization continued. This time the focus change was to position IT to take a leadership role in providing APMG with its services which is contrasted with IT providing services following formal requests from its internal customers.

Aiming to become a strategic customer service provider, the IT function reorganized again during 2004. The IT function was restructured around customer needs, instead of being structured around applications. A new customer service role was created in order to serve as a link between the customers and the rest of the IT function. All of the project resources were also pulled into one major group in order to enable a consistent delivery of projects.

While the IT function's organizational architecture is still in the process of being refined, there are other issues that need to be addressed. They include issues related to outsourcing, cost control mechanisms, issues specifically related to usage of resources within the collocated teams and the distributed teams, etc. This paper will concentrate on the issues related to the distributed teams within the IT function.

### **1.3 The Importance of the Remote IT Outposts**

The central IT groups are located in close proximity to a cluster of Alcan smelters in the Saguenay region in Quebec. The remote outposts of the IT function in APMG include several smelters that are located between several hundred and several thousand kilometers from the IT center. These smelters' IT departments are an integral part of the central IT function. The services that IT provides locally in those plants are customer relationship services, business relationship services and application and infrastructure support services. The customer relationships services include management of customer expectations and addressing problems related to support and operations. The business relationship services include short-term and long-term planning of IT application and infrastructure deliverables, detailed analysis of the customers' requirements and creating project mandates. All of the

projects are then delivered by the central project group. The application and infrastructure services include support for basic common applications and infrastructure like the operating system, the office application suite and other off the shelf productivity applications. These services encompass on-site support for the most critical, in-house developed specialized systems that are closely related to the production. The basic application and infrastructure support is provided through the outsourcing contract with CGI.

The IT support and operational costs are allocated to each plant based on usage indicators such as the number of workstations and the server CPU usage. A share of the overhead costs is also allocated to each of the covered plants. The overhead costs allocation is based on the smelter's share of the total APMG production capacity. Some of the smelters located further away from the center have relatively large number of employees. Because of their size, they absorb a fairly large percentage of the total APMG IT costs. The issues related to the setup of the remote IT outposts suddenly become important because of the combination of two factors: the size of these plants and the IT service cost allocation system.

The cost allocation structure suggests that there could be substantial benefits from the economies of scale. APMG operates 25 smelters in 13 different countries. Currently, the central IT function encompasses around 20% of the smelters and they are all located in the same country. By adding the rest of the smelters, the cost pressure on the existing smelters would be lowered, more focused project delivery can be achieved, the IT architectural standardization costs should be lowered and other cost related synergies can be expected. The IT function as part of APMG with its global presence could benefit from having people from various parts of the world.

In order to take advantage of the economies of scale that could be achieved by adding more plants to the central IT, it is important to pay attention to the issues related to the remote posts. So far this has proven to be a very difficult task.

The transition from being an independent plant based IT department with a few dedicated resources to becoming a part of the larger centralized IT function has not been easy

for the remote posts within APMG. The amount of customer dissatisfaction has increased. When a local user places a call to the central group's technical support, sometimes the person on the other side of the line has difficulties speaking and understanding the customer's language. The amount of knowledge in the central groups related to the local plant's application and infrastructure has not yet achieved the expected levels. The central group contacts are impersonal compared to the recent past where the local technical support resources knew most of the users. When a support issue arises in the late afternoon on the West Coast and when it can only be solved by the central IT resources in the East, the 3 hour difference delays any type of response until the next business day. The problem in this case is that the next business day could effectively be after the weekend.

Due to their remoteness, the plants further away from the central group suffer from being excluded from the value added activities such as planning and project delivery. When planning or delivering new systems it is very difficult to include the needs of all of the customers, especially the needs of customers located far from the center. This is due to the differences in work practices from site to site, different customer expectations, different spoken languages, different time zones, etc. Because of these issues corporate projects that are being implemented in the remote locations often create more problems than they actually resolve. Due to the lack of knowledge related to the plant specific applications within the central group the customer satisfaction within the remote sites has suffered.

Most of these problems are either related to a lack of collaboration between the two sides of the IT organization or to a poor management of knowledge. There are two basic questions that can address most of the above mentioned problems. How should the central IT function take advantage of the knowledge that the local plant based IT resources and customers possess? How should the remote IT outposts and the customers take advantage of the knowledge within the central IT function?

If we look at adding remote plants to the central IT function as an investment decision, its value added potential is large. But we need to be aware of the fact that even the best conceived ideas and initiatives can falter because of a poor sequencing and inadequate

design even if they have full support from senior executives. Sequencing is very important to solving the issues at the remote outposts. Once the existing issues in the remote plants that are currently part of the central IT are identified and solved, then other plants from other countries and continents can be added to the central IT. Also, as Alcan invests into purchasing or building new remote plants, new capabilities should be developed within the IT organization in order to be able to add those new plants to the central IT.

In order to propose a solution to the problem of implementing additions of new remote sites to the central IT, we will start with an analysis of the typical problems than any distributed organization will most probably encounter. Then we will look at the current IT organization strategy and analyze how the strategic goals apply to the IT as a distributed organization. In the end we will analyze the implementation alternatives and propose a framework for adding new remote sites to the central IT. We will also analyze possibilities to improve the current organizational structure and managerial controls in order to allow an implementation of such processes as the knowledge exchange framework.



## **2 ANALYSIS OF ISSUES RELATED TO DISTRIBUTED ORGANIZATIONS**

Due to the nature of the business (commodity, global setting) the IT organization is structured as a distributed organization with most of its resources located in one center and having several sites that could be considered as remote. The goal of this project is to address the problems of integrating other remote sites located in other parts of North America, Europe and the rest of the world. The findings are based on research and on experiences while working within virtual project, support and operations teams for the IT organization at a remote site.

In the last decade a large body of research was created on the subject of geographically distributed organizations. Many of these studies compare performances of physically co-located teams with the performance of geographically distributed, or as some researchers call them – virtual teams. The co-located teams perform better in some cases, the virtual teams in other and in some cases there was no significant difference noted (Maznevski and Chudoba, 2000, p.474). Still, there are many different types of issues that influence distributed organizations that at the same time have a less pronounced effect on organizations whose resources are located in the same physical location.

### **2.1 Physical Boundaries**

Two types of physical boundaries exist in the distributed organization. They are space boundaries and time boundaries.

Today's global organizations span multiple countries and continents. APMG is only one of Alcan's businesses and it operates in 13 countries. Alcan as a whole has operations on every continent. The people that work in those different locations have a need to communicate and work with each other. In today's global corporation it is normal to work

with people that are located in another city, country or a continent. This type of work is very challenging because when people communicate face-to-face, between sixty and eighty percent of comprehensible communication occurs through gestures, body positions, eye contact, and facial expressions. Without the rich source of information cues, team members are vulnerable to cascading misunderstandings and miscommunications that can derail projects, planning or operational activities.

Due to the physical distance and the limitations of the means of communications it is very hard for the resources to get to know each other and to establish serious working relationships. When they are working in the same location informal team dinners and outings can serve as invaluable icebreakers. This is especially valuable during the extremely critical forming phase of the teams.

Besides having to endure consequences of the spatial distance, the organizational resources also have to cope with working in different time zones. Being in different time zones limits the time that the resources can spend together. For example, requests for information needed to continue working on the task in one time zone will delay the execution of that particular task while waiting for the resources in the other time zone to respond.

Different time zones can also bring advantages to organizations if execution of tasks is handled properly. Business basically can operate around the clock. For example if a support issue arises after regular business hours in one time zone, resources that are working in a different time zone can help resolving the issue without disturbing the local resources.

The effects that space and time zone barriers have on the costs are both positive and negative. The larger space between remote and central IT resources result in increase in communications costs. Traveling costs must also increase because people working on virtual teams on projects have to meet occasionally in order to address issues that are difficult to be addressed using communications technology. On the other hand, the costs will go down due to the increased productivity of the IT organization which can now effectively work extended hours.

## 2.2 Technology Issues

The spatial and temporal distance between resources may be overcome by using communications technology. Excessive communication using different types of technology is necessary in order to compensate for the lack of non-verbal communication.

There is a plethora of technological means for communicating over long distance. Telephone and fax have been around for relatively long time and the cost of these types of communications has been falling. The telephone enables instant verbal communication between large numbers of people. The fax, on the other hand enables document sharing and information exchange in a written form.

With the arrival of the Internet the communications media has become richer. With the Internet information publishing became very easy. E-mail is used for text message and document exchanges. Instant messaging is used to exchange short messages.

Video conferencing is not perfected yet but it is very useful for creating communications environment closest to the real thing. Still, facial expressions can be hard to distinguish over video conferencing, and a lot of things can still be happening outside of the range of the camera.

Different technologies can be used to accomplish different communications objectives. In the next couple of paragraphs I will provide examples of usage of various technologies in a virtual project team working on implementation of a computer application.

During the project telephone conference calls were most commonly used for direct communication. The phone was used to accomplish project planning and follow-up activities, requirements analysis and detailed design activities, paired programming activities and task division planning activities.

Desktop conferencing technologies were mostly used as substitute for a whiteboard and also to facilitate the system design, and to facilitate paired programming.

E-mail has the disadvantage compared to the phone of not being instantaneous. Therefore e-mail was used for limited interaction. Today it is a known fact that almost everyone receives too many e-mails and that time for reading e-mail is limited. For these reasons the e-mail exchange was limited to exchanging internet links to technical resources, short important communication messages during the time when not everyone was present, exchanging progress reports when individuals or pairs were working on different tasks, summarization of important decisions and task delegation, exchanging the short-term 'to do' lists, exchanging documents in progress, until they became official and were stored in a document sharing storage. It is important to note that e-mail gives people a chance to think before they write and to finish their thoughts.

Document sharing facilities such as shared network drives, and document versioning systems were used to store information that was considered to be permanent. These documents included documented decision making processes, source code, and technical and user related documentation.

There are two sides to the use of technology in distributed organizations (Benson-Armer and Hsieh, 1997, p.27). On one hand the technology enables people to work together over great spatial and temporal distances. The technology also enables new business opportunities to be created which would be impossible to be created otherwise. On the other hand, technology is only enabler of communications. The technology as a communications medium is emotionally cold – the so called tacit knowledge is not being transmitted. This includes facial expressions, body postures, and body movements (Benson-Armer and Hsieh, 1997, p.21). The possibility of physical touch does not exist. This can cause misunderstanding and a loss of trust which means that as much as the technology helps enabling communications, it can also serve as a barrier.

In general, the implementation of a distributed organization requires a process of maturation where implementers and adopters gradually develop an understanding of how the technology can support the organizational needs (Munkvold, 1999, p.1). Although these technologies are available for use, it is important to understand that they are only tools that

enable the communication. In order to enable efficient communication within the team, the people need to use these tools. Even when the tools are actually used, different people feel comfortable using different tools. The reasons are different and they range from factors like the individual comfort level with the language(s) used within the team, the cultural preferences of the individuals, and the individual personality traits. For example, a person that does not feel comfortable understanding or speaking the language will prefer the e-mail over a telephone communication. Also, an introvert person would feel more comfortable with less frequent communications than an extrovert person.

Training on how to use technologies that enable collaboration must be included especially if the system that enables collaboration is fairly complex. This is important in order to prevent creation of mental models that lead to inefficient use of the technology and consequently to creation of resistance to the new organizational model. The resistance pushes the stakeholders to form underground resistance and to focus their energies away from productivity. Also, instead of using the new communication enabling technologies, the users tend to turn back to using the old entrenched ways.

## **2.3 Organizational Issues**

Although technology increases the possibility to include resources from different geographic locations it also opens the possibility of conflict. Team members will always try to use the local power base to influence the outcomes of major decisions (Benson-Armer and Hsieh, 1997, p.21).

Resistance from the organizational units is one of the major problems encountered in a distributed organization. Again, being far from the center it is common for the IT resources and customers at the remote sites to feel forgotten. This could be a consequence of the different languages spoken at the center and in the remote locations. It could also be a consequence of different cultures. The centralization by its very nature tends to dampen morale by disrupting daily work rhythms and generates "noise" that filters up the management chain (Nimocks, Rosiello, and Wright, 2005, p.1). When this is the case,

resistance is being formed and it typically it goes underground. When conflicts are pushed underground they cannot be seen by management or even by people lower in the company's organizational structure and in the end those conflicts tend to explode fairly badly.

Resource control is very difficult over the spatial and temporal distances. It is impossible for the management typically located in the central organization to monitor the activities of the resources in the remote locations. Resources located away from the control center can also participate on more than one team and can always be pulled away by their local users and managers to work on issues closer to home. This can pretty much go unnoticed by their bosses who are located far from their office in a different geographical location and in a different time zone.

In order to succeed in the implementation of the distributed organization it is critical to ensure involvement of all of the key stakeholders. This includes participation of top management who is responsible to provide the reasoning behind that organizational setup, and is also responsible for providing the necessary support during difficult times. The process of identification of champions is important in order to ensure that there are people directly responsible for implementing the distributed organization. The champions are also responsible to follow up on issues, to track detailed action plans, and to provide reports to the top management. User involvement and participation is critical, because the users are the ultimate reason for the existence of the IT organization. Users located in the remote sites need to receive special treatment so that they do not feel forgotten. This can be ensured by regularly scheduled meetings, visits by the top management and by the champions, and especially making sure that the users are informed on time about any organizational changes that may affect their business. The existing IT resources, located both in the central and in the remote locations need to receive training (or coaching) on how to adapt to the virtual environment, different cultures, languages, etc. They will have to be involved in the processes of adapting of the existing and the creation of the new work practices.

## 2.4 Culture as a Factor

Culture is a set of deeply ingrained values associated with societal effectiveness, shared by an identifiable group of people. A simpler definition of culture says that culture represents “the way things are being done around here”.

Cultural values are influenced from different sources. Among the strongest are the national, organizational and professional. Each of these different cultures consists from a set of deep-level values, norms and practices shared throughout that nation, organization, or a profession (Maznevski and Chudoba, 2000, p.481).

The main characteristics of a culture are that it is shared, learned and it is systemic (Thomas, 2002, p.28). Culture is shared within groups of people. The groups can be as small as to include only a couple of individuals (e.g. families) and can go up to including several million people (e.g. nations). Culture is transmitted through interactions with the environment through a process of learning. For example, a lot of the cultural values are learned through the stories that parents tell their children. The culture is also organized system of values, attitudes, beliefs, and behavioral meanings related to each other and to the environmental context (Thomas, 2002, p.29).

Cultural values influence the perception filter through which a person interprets information needed to make decisions. These differences in perspective offer potential for multicultural teams to perform well. However, cultural values also influence members’ preferences for social interaction norms. Because of this often hidden difference multicultural groups find making cooperative decision very difficult which can hinder their performance. The key to the performance of multicultural teams is their engagement in integrative processes such as communication and conflict resolution.

Individual members of a distributed organization come from different cultural contexts. Each individual potentially carries different assumptions about how to enter into and maintain relationships, how to define and execute tasks. Assumptions related to responsibility differ

among cultures. The attitudes towards power and authority which are known as power distance have a lot to do with those assumptions.

Individuals bring with them influences from the national and organizational cultures. These two distinct cultures influence individuals in a completely different manner, because the organizational culture differs from the national in several elements (Thomas, 2002, pp.40-42). While the individual's relationship with his/her national culture is unconditional, the relationship with the organization is conditional. Each individual is completely and unconditionally immersed in their national culture, while their immersion into the organizational culture is only partial and it is conditional on the relationship between the firm and that individual. While individuals are born into the national culture, they are slowly immersed into the organizational culture through a process of socialization.

Beside the geographical and national influence on one's culture, the professional background of the individuals also has influence. Within the boundaries of a certain profession certain basic assumptions are being shared which reduces the complexity of interaction. Interactions that cross professional boundaries are inherently more complex due to a lack of common language.

Notable cultural differences include the already mentioned attitude toward power and authority (or power distance), differing beliefs and customs relating to individual vs. group-related work, different communication styles and preferences, different holidays (different days, religious/traditional/state holidays, amount of personal holidays), different amount of working hours (while some companies in Quebec have 7 hours work days during the summer, the same company's work day in British Columbia lasts 7.5 hours, and 8 hours in the United States), different attitude toward overtime (in some part of the world it is presumed that professionals work overtime without compensation, while in some other parts the overtime is not worked unless the individual is fully compensated).

When individuals from different cultures get together to work on a task their cultural differences can either make or break the execution of that task. The differences can be seen



as an obstacle because of the different expectations that each individual brings into the cultural mix. At the same time, the differences can be utilized to accomplish tasks that would be impossible to accomplish if the group consisted of individuals from the same culture.

## **2.5 Loss of Trust as a Factor**

According to Gartner (Bell and Frey, 2002), the main causes of problems in virtual teams are communication issues, ambiguity, a loss of trust and fears of meeting expectations and goals when work is interdependent and completed almost exclusively on an "out of sight" basis. It could also be argued that the issues specific to the distributed organization are coming from two sources: (1) the resources are separated by distance and because of that (2) they are forced to use technology to mediate their communications and collaborative work.

Teamwork depends a lot on the members' ability to trust one another and the technology cannot be a substitute for the relationships that engender such trust. Trust is relatively easy to be established but at the same time it is easy to be broken and then it becomes awfully difficult to be re-established. When teams work on tasks that are characterized by interdependence between various resources that reside in different locations the level of communications between those resources must be very high. We have to be aware of the fact that people in general are cautious when it comes to sharing information in an environment of anonymity which is typical for working in geographically distributed teams. If communication and information sharing do not happen on a regular basis, ambiguity sets in. Ambiguity creates gaps between perception and reality and it leads people to start making assumptions about things that are not clear in their minds. Wrong assumptions can lead to heightened amounts of conflict which ultimately leads to erosion or even complete loss of trust.

According to Gartner (Bell and Frey, 2002), there are four essential elements that the trust is built upon: (1) dependability, (2) consistency, (3) congruency and (4) mutuality or reciprocity. Dependability of individuals is essential because if the team members know that they can depend on the promises of a certain individual the team will function better.

Consistency applies to treatment of individual team members, application of processes and communications standards. Building of trust will be enabled if all of the team members are treated with equal respect. The equal respect reduces the possibility of interpersonal conflicts within the team. How to execute tasks is also a point of contention within teams. This can be solved by defining processes, applying them in a consistent manner, and adjusting them as necessary. Again, communication is in the center of all of the problems related to the geographically dispersed organizations, so consistency of communications is very important for the well functioning of the teams. Congruency is important in order to ensure match between perception and reality. Verbalization of goals and expectations, precise task division, periodic progress reports are of essential importance to minimize gaps between perception and reality. Mutuality is accomplished when there is a sense that success of every individual largely depends on the success of the whole team. The opposite is also true. The failure of one individual must be considered a failure of the whole team. This being said, it is easy to see how the conflict arises in the team when individuals are being blamed for mistakes.

Each of these elements applies to building trust both in the physically collocated teams and in the geographically dispersed teams. The bigger challenge of course is to build and maintain trust in the virtual environment. One conflict between two individuals removes the dependability element from the picture and loss of trust ensues.

The services that the IT function provides are dependent on trust built between support team members in different locations, as well as on the trust between the central IT resources and the customers located even in the most remote sites. For example, when a project is being delivered, the remote site customers must learn to depend on the resources from the central IT. On the other hand, the central IT resources have to apply consistent treatment to all of their customers. This can only be achieved frequent communication sessions between the central resources and the remote customers where the expectations of both sides are being managed. Only when a high level of collaboration between the central resources and the remote customers is achieved we will be able to observe reciprocity in action.

## **3 INTERNAL ANALYSIS**

In this chapter we will outline and analyze the current strategy of the IT organization and we will relate the issues strategy to the distributed parts of its organization. This analysis does not intend to critique the existing IT strategy. The goal of this analysis is to propose a solution that will fit into the existing strategy.

### **3.1 IT Organization Strategy**

The IT organization has been going through constant changes over the last three years. First, the organization was centralized with most of the resources being located in a central location. Then, the structure of the organization was changing from an organization where the resources were centered based on their application related expertise toward an organization that provides customer service and relationship management, business needs management, project delivery, and support and operations activities.

#### **3.1.1 IT Strategy as Part of the APMG Strategy**

Out of this constant process of change a clear strategy has emerged. The emergent strategic positioning of the new organization is to act as a strategic customer service provider within APMG. Strategic customer service provider means that the IT function is committing to provide high quality information technology services to APMG in order to enable APMG to attain its business objectives. IT services need to be of a high quality and high reliability and at the same time the services need to be compliant with the infrastructure standards defined within the company.

This could be achieved by a constantly aligning the IT business objectives with the business objectives of APMG. As the APMG business objectives change on an annual basis, the IT function objectives need to be realigned as required. This could be achieved only if the relationships with the customers are proactively managed. Instead of reacting to customer

requests, the IT function must be able to establish a system where the customer relationships are managed on a more formal basis. The IT resources would have regular discussions with customers where both problems and new opportunities would be discussed.

In order to attain and maintain the position of strategic customer service provider, the services that the IT function provides must be agile. As new problems arise or as new opportunities are being created, the IT function must have an organization that will be able to quickly adapt to these changes.

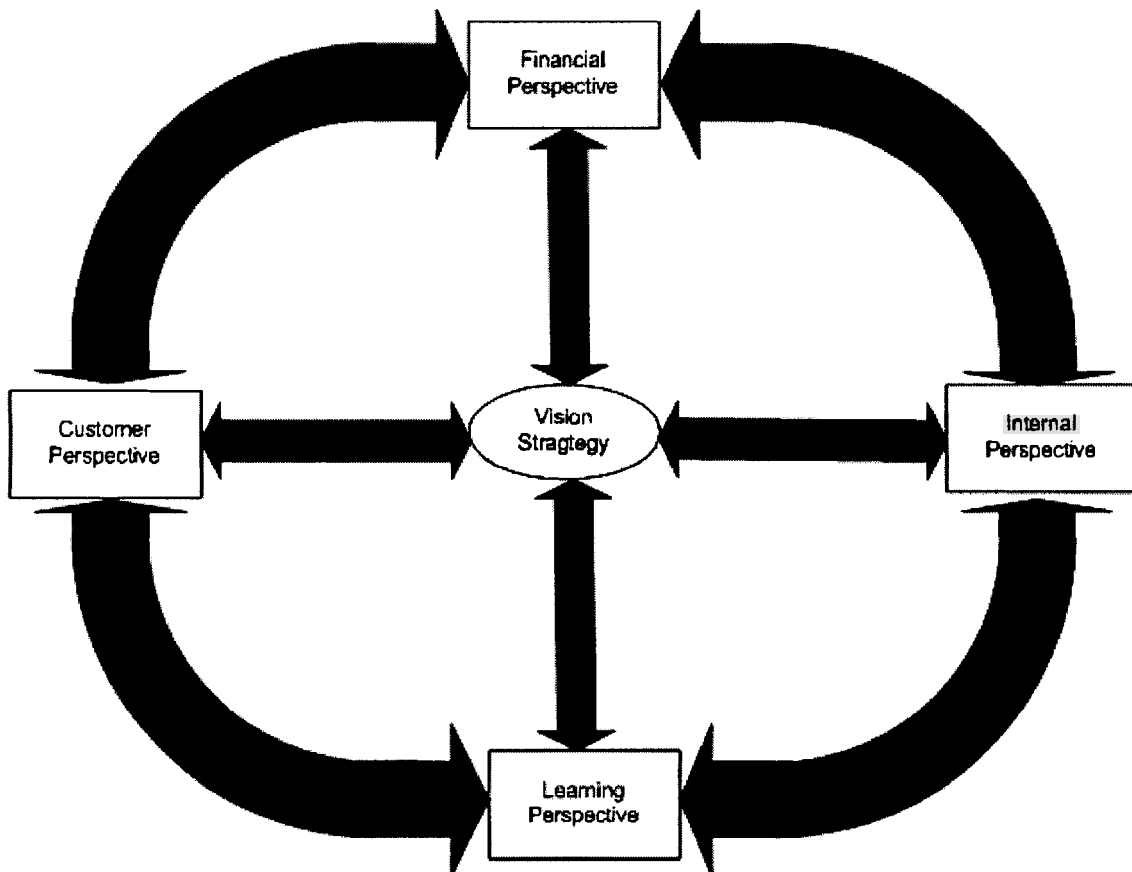
In order to provide fast and high quality solutions, the basic IT infrastructure must be standardized. Standardized basic infrastructure enables the IT function to provide reliable services to its customers. Once the higher reliability is achieved, the risk and uncertainty associated with the infrastructure are lowered. Stable infrastructure then creates a solid basis for the higher levels of IT services to be of a higher quality.

IT organization's vision must be set for the medium term which is somewhere between three and five years in the future. Because we are talking about IT, which is a fast changing world, the vision cannot be set too far in the future. The current vision for the IT organization was set around the four dimensions of the balanced scorecard methodology.

### **3.1.2 Balanced Scorecard Methodology**

The balance scorecard methodology (see Figure 3-1) is a tool that defines four different perspectives that should be used when defining goals for the organizational system. The perspectives that make the basis of this methodology are financial perspective, internal perspective, learning and innovation perspective, and a customer perspective. The financial perspective defines goals closely related to the financial expectations of the investors. The internal perspective defines goals with regard to the excelling at internal business processes. Learning and innovation perspective concentrates on goals that will help sustaining the ability to change and to improve in the future. The customer perspective defines goals that are related to how our customers see us. The balanced scorecard is 'balanced' because it dictates that equal attention is paid to each of the perspectives (Kaplan and Norton, 1993).

**Figure 3-1 Balanced scorecard methodology**



*Source: Darko Bajkin based on Kaplan and Norton (1993)*

The balanced scorecard methodology dictates that the business objectives (or goals) should be set based on the organizational vision and the strategy. The number of objectives per perspective should be balanced and the authors of the balanced scorecard methodology recommend defining anywhere from 3 to 5 measures per perspective. Each of the objectives must be associated with a minimum of one measure. Once the measures are defined they become indicators of the organization's performance and they should be followed on a regular basis.

It is important to note that the different perspectives are not independent from one another. The better the ability of the organization to learn is, the better the financial results will be. The better the internal processes are, the better the customer satisfaction is. The opposite is also true: the better the financial results are, the better the organizational learning

will be, and the higher the customer satisfaction is, the more efficient the internal processes are.

We will use the balanced scorecard methodology to analyze the strategic objectives of the IT organization. We will analyze the effects of the distributed organization on those strategic objectives. We will not go deeper into defining measures and targets for the individual objectives for two reasons. First reason is because we would like to pay the same attention to each objective. When measures and targets are defined, the numbers that those targets represent tend to stir the focus toward several objectives only. Second reason is that we would like to keep this analysis at a higher level. We are interested at defining an implementation approach which is more of a framework, rather than defining series of concrete steps or a cookbook on how to implement these remote site additions.

The IT strategy described in the following sections is based on my own interpretation of what does it take for an IT organization to become a strategic customer service provider. Alcan's integrated management system was taken into consideration when analyzing the objectives for each of the perspectives.

### **3.1.3 Organizational Vision**

IT organization's vision is to be recognized by its expertise, to provide customers with high level of satisfaction, to achieve excellence in providing services and managing financial objectives, and to develop IT resources' competencies in order to motivate them to achieve the common objectives.

Both the strategy and the vision of the IT organization were set in accordance with Alcan's integrated management system. The three main programs of value-based management, EHS First and the continuous improvement are deeply ingrained in the strategy developed by the IT organization.

**3.1.4 Financial Perspective**

In order to achieve the strategic positioning of becoming a strategic customer service provider to APMG, the IT organization must be recognized for the expertise that it brings to the company. Recognized expertise builds confidence within APMG toward the IT organization. When IT resources talk to the customers about new opportunities, their proposals will have more weight if the reputation of the whole organization is good. The IT organization aims to be recognized as essential contributor in achieving Alcan’s main goal of value maximization. In order to help APMG achieve its primary goal of value maximization, the IT needs to spend more time on value added activities such as strategic planning and project delivery. The projects that have a higher internal rate of return than the threshold specified for all Alcan’s projects should be given a priority. Another way of achieving the financial goals is to continue with the program of asset optimization. The asset optimization program aims to squeeze out more out of the existing systems and to retire systems that are old and obsolete. Table 3-1 summarizes the strategic objectives related to the financial performance of the IT organization.

**Table 3-1 Financial perspective objectives**

IT organization must be recognized as essential contributor in achieving Alcan's goal of value maximization
IT organization must be recognized for its expertise
Increase time spent on value added activities
Continue execution of the asset optimization program

**3.1.5 Customer Perspective**

The customer satisfaction must be very high on the list of the IT organization because the customers are reason for the organization’s existence. IT organization’s customers are practically their shareholders. High level of customer satisfaction can be achieved by ensuring that the infrastructure supported by IT is reliable and secure. Also, the IT organization should be structured in such a way so that the customer service role is clearly defined and highly visible. In order to minimize the uncertainty and risk and to bridge gaps between the

customers and IT, the interfaces between the customers and IT need to be defined through implementation of service level agreements. Table 3-2 summarizes the strategic objectives related to the customer satisfaction.

**Table 3-2 Customer perspective objectives**

High level of reliability of the IT infrastructure
High level of security of the IT infrastructure
Clearly defined and visible customer service role
Implementation of service level agreements

**3.1.6 Internal Perspective**

In order to satisfy its customers the IT organization must achieve excellence in the internal business processes. Integration of continuous improvement practices is a definite must. Developing innovative techniques aimed at improving performance and efficiency is a never ending process. The application of the continuous improvement processes is expected to have a positive effect on the transfer of best practices and knowledge throughout the company. Implementation of the efficient centralized support and operations organization and the processes that this organization encompasses is also very important. On the other hand, the implementation of a stronger project management office which would have a role as a reference center for project management. Another important business process is an implementation of collaborative network between the North American IT and the IT centers in other parts of the world. Table 3-3 summarizes the strategic goals related to achieving excellence in the internal business processes.



**Table 3-3 Internal perspective objectives**

Integrate continuous improvement practices
Ensure best practice and knowledge transfer throughout the company
Implement stronger project management office
Implement a collaborative network between North America and other parts of the world

### **3.1.7 Learning Perspective**

Development of the internal resource competencies will create motivated employees that will be able to contribute to the overall excellence of the organization. Environment, health and safety should be incorporated within the IT organizational culture because together they represent Alcan's effort to achieve long-term sustainable operations. Implementation of a culture of acknowledgement should create higher levels of motivation of the IT resources. Growth of the resources and continuous improvement should be one of the primary goals of the IT organization. Culture of life/work balance is also important to create healthier and more motivated employees. Change management is another area where the IT organization should learn how to excel in. If we take a look at the last couple of years, there were a lot of changes in the organization itself that had a negative effect on the resource motivation, as well as on the customer satisfaction. Every time a new organizational change was announced, instability was caused because of the poor change management practices. Table 3-4 summarizes the strategic objectives that define the path to sustainable IT organization.

**Table 3-4 Learning perspective objectives**

Incorporate EHS First practices into IT
Implement a culture of acknowledgement
Implement a culture of work/life balance
Implement change management culture

## **3.2 How Do the Distributed Organization Issues Relate to the IT**

So far we have examined the strategy and business objectives of the IT organization. Also, in chapter 2 we took a look at the issues that are typical to distributed teams and

organizations. Now we will examine the effects that those issues could have on the strategic objectives of the IT organization.

Please note that trust issues are implicitly always present wherever any issues related to the distributed organization are mentioned.

### **3.2.1 Financial Perspective**

In order to satisfy the goals set by the shareholders (the 'shareholder' in this case is APMG) the IT organization has to pay attention to the management of the financial resources from the remote sites that are being integrated into the IT organization. Management of these financial resources includes management of operational and support costs, as well as management of the value added activities such as project delivery and planning.

In order to be recognized as an essential contributor in achieving Alcan's goal of value maximization IT has to execute its strategic planning process so that it involves stakeholders from the remote sites. Ideally this process would include remote site management, customers and IT resources. IT strategic planning as other strategic planning processes can be characterized as highly political, highly iterative, interpersonal, and highly creative process (Cecere and Rosenberg, 1999, p.1). These characteristics make it very difficult to execute this process in the virtual environment. The difficulties arise because of the importance of the non-verbal communication in these types of processes. In order to execute the strategic planning properly, the stakeholders (or most probably their representatives) would have to sit in the same room for a predetermined period of time to complete the exercise. The feedback and follow-up from the strategic planning can be done using the technology and can involve the rest of the stakeholders.

To be recognized for its expertise, the IT organization has to utilize the expertise of the IT resources and customers located in the remote sites. There are many resources located in different sites that have knowledge of specialized business areas and that can help the IT organization deliver systems that ultimately add value to the whole organization. To get there, IT has to first implement some type of a collaboration framework and then a knowledge

sharing framework. The issues related to this objective would be the time zone (both positively and negatively), various cultural issues, and language.

To increase the portion of time that needs to be spent on value added activities IT has to involve their resources and customers located in the remote sites. When a new project is starting or when it is being planned, the needs of the remote sites will need to be incorporated. This could only be done by involving the remote customers, and probably the best way to do that is to also involve the local IT resources. When the project is being implemented the role of the local resources is critical in order to achieve the acceptance of the deliverables. The distributed organization issues that play role here are the different cultures, time zones, and the preferred technological means for communication.

The asset optimization program has a goal to increase the cost-performance ratio from the existing systems and to identify legacy systems that are ready for retirement. The cost-performance ratio can be increased from the existing assets in many different ways. But first these assets will need to be identified. The involvement of the IT resources and customers from the remote sites is crucial when it comes to discovering the requirements to complete this activity. Most of the work here can be done from a central location after the needs are collected. In order to be able to enable needs gathering some type of collaboration framework will need to be established. The issues that apply here are the issues of culture, language, and time zone.

### **3.2.2 Customer Perspective**

The customer perspective defines the customer requirements related to the performance of the IT organization. Customers of the IT organization are scattered across the remote sites and may be from different cultures, speaking different languages, and they may be used to certain processes that used to apply to the usage of the local IT resources.

High level of reliability of the IT infrastructure can be achieved by having efficient IT operations. Regular backups, cleanup, clear procedures on how to perform the operational tasks, clear procedures on the processes needed to perform any of these activities need to

exist. Once these processes are defined, it becomes relatively easy to perform the procedures that are defined as part of the process. The involvement of the remote internal IT resources in maintaining the high reliability is minimal. During process definition time, the local resources are involved in knowledge transfer and coaching of the new operations resources. These operations resources are either going to be central IT resources or resources from the local or the central outsourcing provider. After the process is defined, the IT resources from the remote IT site are not going to be involved anymore in the operations activities of the basic infrastructure. Still, to complete the setup of these processes, collaboration and knowledge exchange frameworks will need to exist. The local IT resources are practically the customers in this case. The operations resources are responsible for communicating changes to the customers. When a change is being applied it needs to be communicated to all of the customers. Although the issue of language is present here it is very easy to address it by sending e-mail messages translated into several languages.

Ensuring high level of the IT infrastructure security has similar reasoning as ensuring high level of reliability of the same infrastructure. This is an ongoing process controlled from a central location where local resources do not have much or even any involvement.

Customer service representatives currently exist as a sub-department of the IT organization. There is a central part of this department where resources are responsible for analyzing issues coming from each of the remote sites and making sure that issues that are common are addressed at the organizational level. Each remote site has a dedicated customer service representative who is responsible to address all of the local customer problems. Customer service resources are also responsible for acting as a link between customers and the outsourcing suppliers. The communication between the central and the local resources is fairly active because there are many issues that the central IT needs to be aware of and that it needs to address so that the whole organization benefits from their solution. The requirements for existence of collaboration framework and knowledge sharing system here are very high and most of the issues that apply to the distributed organization apply here. Technology issues, time zone, cultural and organizational issues apply.

Service level agreements (SLA) between the customers and the IT exist in order to minimize the gaps between perception and reality. They also exist to set costs expectations so that the budgeting process will have less uncertainty. The SLA is negotiated by the local customer service representative. The local customers are involved to set the expectations for the level of required service and the local management is involved in order to control costs. The central IT gets involved to check if the expectations set in the SLA agreement are realistic. The distributed organization issues do not really apply here because the communications between the central and the local resources is very minimal when compared to the level of communication described in the previous paragraph.

### **3.2.3 Internal Perspective**

The internal perspective looks at the level of organizational excellence in the internal processes. Well defined processes are essential to the work in a distributed organization because they form a basis for the trust in the virtual environment. Well defined processes minimize the possibility of the so-called 'process based conflicts' where team members argue on the approach or the process that needs to be applied to solve the problem they are currently working on.

Continuous improvement process is a part of Alcan's integrated management system. Alcan as a whole has invested large amounts of resources into the program. The program approaches improvement of internal processes in such a way that the improvements happen on a continuous basis. IT is integrating the continuous improvement practices on several levels. First, it has dedicated resources that work full time on improving the internal processes. Also, there are resources in the remote sites that are working with the local customers on improving the customers' processes. Here we are interested more in the internal IT process improvement because that is where the distributed organization issues occur. The continuous improvement program preaches action that is coming from the bottom and moves up the chain of responsibility. So in our case the continuous improvement related to the internal IT processes would start in the remote locations and would slowly move up toward the central IT. The communication makes the essence of the continuous improvement

practices which in turn makes the integration of those practices open to all of the issues with the distributed organization. Different cultures, time zones, and organizational issues such as management support are some of the issues.

The goal to transfer the best practices and the knowledge throughout the organization already has the distributed organization issues built in. In order to transfer knowledge, established communications must be present in the organization. Transferring best practices basically means transferring and implementing knowledge about processes. Again the same reasoning applies as to the knowledge transfer – established communications must exist prior to addressing this issue.

Project management office has a role to design the documentation to support the project management processes. The project management office works from a central location and the communication with remote sites is very limited. The resources that have a need to access the information generated by the project management office are mostly project managers located in the central location. The communication is done simply by accessing the necessary documentation. The expansion of the role of the project management office is to be used as a depository of experiences related to managing projects. This practically goes back to our previous problem of transferring knowledge, which in this case is very specific. The knowledge transfer problem is basically in the core of the distributed organization and therefore it exposes this problem to the issues related to the distributed organizations.

Collaborative network between the plants would mean that basics for the implementation of an distributed IT organization throughout APMG would need to be formed. That problem is addressed later in this document. The problem of collaboration should be addressed by creating a framework for collaboration between the various potential remote sites.

### **3.2.4 Learning Perspective**

The learning perspective addresses the goals related to the sustainable capabilities of the organization to change and improve in the future. In order to do that on a continuous

basis, a change management culture needs to be present within the organization. Also a culture of continuous improvement of individual and organizational skills must be present.

EHS First practices are also dictated by Alcan's integrated management system. These are practices that aim to ensure sustainability of Alcan as a company. At a higher level Alcan's EH&S policy advocates involvement of all of the necessary stakeholders when it comes to making decisions important to its sustainability. Management of relationships with both the internal and the external stakeholders is in the core of this program. For IT the stakeholders involve the employees (the ones working at a central location and at a remote site) the APMG management, the management and customers of the remote sites, and various external suppliers of IT services. Some of these stakeholders are located in the remote sites which means that relationships will have to be established and especially maintained in a virtual environment.

Culture of acknowledgement aims to recognize the effort of the employees. In order to implement this culture of acknowledgement it is important to know that the IT management will need to be constantly informed about the efforts of their employees. Open communication between the management which is located in the central group and the resources located in the remote sites must be maintained on a regular basis. This issue does not seem to require excessive use of communications technology, so it is not susceptible to the issues related to the distributed organization.

Culture of work-life balance is also something that does not require excessive communications. It involves education and consequent coaching sessions that are given usually to a group of people at a time.

Change management culture is very important for the IT organization because the information technology itself is constantly in a state of change. Also, the IT organization has been constantly changing over the last couple of years which means that the adaptability of the resources working for the IT organization must be fairly good. The foundation of the change management culture can be implemented by introducing processes to introduce and

control change. These types of processes involve high levels of communication and collaboration between all of the IT stakeholders. Different cultures, languages will need to be managed, as well as organizational issues, and time zone related issues.



## 4 FULCRUM ANALYSIS

We have analyzed the general issues related to the distributed organizations. These issues are valid only for geographically distributed organizations where communication between members of that organization can only be performed using different communications enabling technologies. It appears that in order for the distributed organization to work, the processes of communication, collaboration and knowledge transfer need to be addressed.

Most of the negative effects of the distributed organization come from the spatial and temporal distance between IT team members located on different sites. Difference in time zones poses the biggest challenge on the overlapping of the work hours by the individuals that work on the same team. At the same time the different time zones allow the company to extend the working hours of that particular team, and possibly to ensure work around the clock if the team was spread into enough of the time zones around the world.

There are various economic factors that have to be considered specifically for the distributed organizations. Costs for using the communications technologies grow, travel needs increase. At the same time learning is enabled for the whole organization which pushes the organizational learning curve down which ultimately pushes the organizational costs down. As the organization grows by adding new remote sites, economies of scale start playing an important role. As the size of the IT organization grows, the IT should be able to exercise more power over its suppliers, the more investment possibilities open up, and labor specialization allows expertise to be built and used within the organization as a leverage to accomplish various tasks. The economies of scale can also cause problems when the organization grows so much that the control and monitoring of resources becomes very difficult. The incentive system needs to be looked at and redesigned to foster more effective communications, collaboration and knowledge sharing.

There are several different types of technologies that can be used to enable communications in distributed organizations. Each of the technologies has its own place and ways to be utilized. They enable organizations to tackle business opportunities that could not be tackled otherwise. At the same time the communication using the technology is deprived from the non-verbal aspects which make up to 80% of the communication.

Because of the physical distance between team members potential political and other organizational issues can arise. The distance between the management and the resources and their remote customers can cause lack of information exchange between the various stakeholders which can lead into problems with resistance being created away from the center, problems with resource control, and problems with conflicts that are difficult to resolve.

The national, organizational, and professional cultures influence the way each of the individuals perceive, make assumptions, create expectations and act based on those expectations. The expectations created based on our cultural values can be so different that they can cause communications problems and ultimately conflicts between teams. Culturally diversified teams can perform better in situations where the strengths of the various members can be used to the advantage of the whole team.

At the end we have concluded that the members of the distributed organization have to trust one another in order to be able to work together. Trust is very fragile in this environment and if it is lost, the virtual team is most probably going to fail in their endeavor. We have concluded that there are four basic elements that make up the trust between team members: dependability, consistency, congruency and mutuality.

After analyzing the general issues with distributed organizations we analyzed the effects of the distributed organization and its issues on the goals of the IT organization. We analyzed each strategic objective and concluded that the objectives which involve either simple communication or collaboration or knowledge sharing processes between the central IT and the remote sites are exposed to the issues related to the distributed organization. This is

especially true for the internal and the financial perspectives. Table 4-1 summarizes the level of collaborative processes required for each of the perspectives.

The customer perspective requires the least attention of all the perspectives to be paid to the issues that are related to the distributed organization. Customer service is pretty much decentralized in order to fit the needs of each of the remote sites. Local IT resources, especially the customer service representative, should be in charge of taking care of the customers. The only time they have to pay attention to the virtual organization issues is when the customer service is performed from the center. This perspective can resolve most of the issues related to distributed organizations using proper communication processes.

The learning perspective requires more attention to the issues related to the distributed organization. Issues such as stakeholder involvement over the geographical distances and time zone differences are definitely related to the virtual organization. Also, in order to implement a change management culture a setup of a collaboration framework is required.

The management of the shareholder (which in this case is APMG) expectations through setting financial goals requires involvement of the stakeholders from the remote sites. When it comes down to moving the organization towards spending more time on value-added activities, or optimization of existing assets, or using IT experts located in various locations the level of required collaboration is high. Here we start introducing the highest level of the collaborative processes – knowledge sharing.

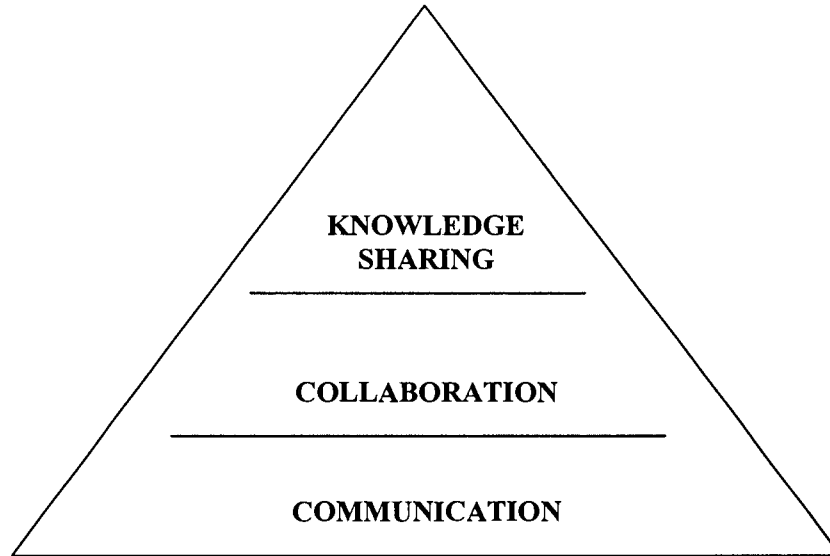
The internal perspective requires the most attention to the issues related to the distributed organization. The management of the internal business processes requires attention to be paid to a proper setup of processes that enable the proper functioning of the distributed organization. This perspective contains two objectives that if implemented would establish the foundation for the rest of the objectives. One of the objectives is to establish collaboration between different parts of the IT organization. The other objective is to enable knowledge transfer throughout the IT organization.

**Table 4-1 Collaborative processes requirements per perspective**

<b>Perspective</b>	<b>Level of collaborative processes</b>
Customer perspective	Communication
Learning perspective	Communication, collaboration
Financial perspective	Communication, collaboration, knowledge management
Internal perspective	Communication, collaboration, knowledge management

In order to implement the distributed organization, the various levels of collaborative processes need to be setup (see Figure 4-1). The communications processes are at the bottom of the pyramid and they form the base for the higher level collaborative processes. Collaboration is the next level above which includes communications and building relationships. Knowledge sharing is at the top of the pyramid as the next level of the collaboration.

**Figure 4-1 Collaboration processes hierarchy**



*Source: Darko Bajkin*

If we analyze the state of the collaborative processes between the remote sites and the central part of the IT organization we can see that the state of those processes varies from

site to site. The sites closer to the center where the same language is spoken and where the culture is the same show higher levels of collaboration than sites that are geographically and culturally distant from the central IT. Communication is present but still not consistent. It varies between departments and again from site to site. Resources at the remote sites are mostly oriented at support, operations, and customer service. There are very few resources at the remote sites that are involved in project delivery. The reason for the low state of the collaboration processes at the remote sites could be that the remote site resources are more oriented towards the non-value added processes, which do not require high levels of collaboration or knowledge sharing. Or, it could also be the reverse – because the IT organization faces the cultural and language barriers, the remote site resources are being stripped from more responsibility.

Still, even at the remote sites where there are no resources that participate in project delivery or planning activities, there is still a need for the collaborative and knowledge based processes to be implemented. For example, continuous improvement practice incorporation or stakeholder involvement (to name a few of the more complex objectives) requires higher levels of collaboration.

So if a new remote site were to be added, how does that process need to be executed? To answer this question we will first analyze the possible approaches to our problem. Once we decide on the more appropriate approach, we will analyze the details of the implementation.

## **5 REMOTE SITE ADDITION: IMPLEMENTATION ANALYSIS**

We have analyzed the potential negative effects that the distributed organization may have on the IT organization as a whole. When a new remote site is being added to the central organization these effects need to be specifically considered. In order to mitigate those issues we will analyze the alternatives available when planning for addition of a new remote site. Here we will look at two major issues. First, which sites are good candidates for joining the central IT organization? Second, should the addition of the new remote site be approached as an alliance or as a merger/acquisition?

Currently, the APMG IT organization is connected by at least some loose connections with its North American manufacturing sites and with a limited number of the European sites. The process of adding new sites is being handled more as an acquisition. The IT organization arrives at the remote site and makes all of the changes with very limited consulting of the local resources and customers. They implement a new organizational structure from the central location with simply reassigning resources to their new managers and redefining their roles and responsibilities. No project mandate is written and accordingly no project manager is assigned.

### **5.1 Strategic Fit and Economic Analysis**

The businesses today operate in a global environment. The globalization has different effects on the business and the IT organization. On the one hand the globalization opens the boundaries between the different countries so that exporting products becomes easier and cheaper. The companies can also explore possibilities of locating operations abroad. On the other hand, the globalization opens the doors to competition from abroad. APMG has a global presence and it operates in 13 different countries. The competition in the aluminum industry

is based on costs so APMG and because IT is part of the APMG, the cost control is important part of managing this function.

The addition of the remote sites to the central organization can be interpreted as a market penetration strategy. For the IT organization the market are the plants within APMG. They aim to penetrate the market in order to add new customers for their existing products. In order for a market penetration strategy to be successful, a focus needs to be established. The focus should be defined around the fit between the needs of APMG as a whole, the needs of the remote site, and the service capabilities of the IT organization.

The main incentive for creating a centralized IT organization with remote outposts is to lower the operating costs of APMG as a whole. The focused market penetration should bring various benefits to the table: learning effects, economies of scale, bargaining power over the suppliers, and lower coordination costs. The expected benefits at the APMG level transcend down to the level of the individual manufacturing plants. When a manufacturing plant replaces its local IT department with the central IT organization, they can expect to be served by a bigger pool of resources with various expertise, lower long-term costs of IT support and operations, better customer service, IT operations around the clock, implementation of large projects and more value added services.

The more a process is repeated the better the organization is becoming at executing that process. As the organization is learning, the efficiency of the execution is greater. This ultimately pushes the cost curve downward and it is known as the effect of the learning curve. Distributed organizations allow the effects of the learning curve to positively affect the organizational costs. The distributed organization enables the information to travel throughout the different sites which makes organizational learning to happen in all of the remote sites as well as in the central location.

As the distributed organizations grow, the question of scale economies becomes interesting. Economies of scale should play a positive role in the distributed organization. In general average costs decline because of a number of factors, including among others

automation, supplier power and labor specialization (Samuelson and Marks, 1992, p.251). By increasing scale the centralized organization may be able to bring in new process automation which might not have been feasible before the centralization. The bigger the IT, the more plants they cover, the more power over the suppliers of services and products they should be able to exercise. Labor specialization becomes beneficial when certain expert that was covering operations in a number of plants is assigned to cover a newly added remote site. If that particular resource is versed in his area of expertise there is a good chance that his work will not increase after adding the new site.

On the other hand, economies of scale may have negative impact when problems of organization, information, and control arise (Samuelson and Marks, 1992, p.251). As the organization's scale increases so do the problems of coordination of efforts. Geographically distributed organizations could introduce coordination problems because of the lack of direct touch between the central location and the remote site. In order to address the potential raise in the coordination costs, the processes that enable the higher levels of collaboration will need to be properly designed and implemented. Once the collaboration processes are in place, the coordination costs should go down.

The productivity of the IT organization could definitely be increased if the organization can take advantage of the time zone difference. As we have already mentioned the time difference could enable the remote sites to get round-the-clock coverage from the IT.

The incentive system in a distributed organization must be setup differently than the incentive system in an organization where all of the resources work in the same location. Lack of incentives for adopting new work practices creates barriers to implementation of the distributed organization. When approaching the implementation of the distributed organization, changes should be considered to the reward system to include incentives for collaboration and information sharing.

Transaction costs involved in setting up a remote site should also be considered in our analysis. Transaction costs have three components: search costs for service provider, costs of



writing a contract and costs of maintaining the contract. The search costs are basically non-existent because of the presence of only one provider of services – the central IT organization<sup>2</sup>. The contract writing costs include analysis and identification of the services that the IT organization can provide to the remote site, and then writing the service level agreements between IT and the customers in the remote locations. Maintaining the contract includes coordination of resources and adjustments to the service level agreements.

Several types of remote sites may be considered to be added to the central IT organization. These could be small IT departments located in a location distant from the central IT that does not have enough resources to perform all of the necessary IT services. They could also be IT departments that have outsourced some of their services to an outside provider which does not satisfy their requirements. If Alcan were to merge with a new company, the destiny of the newly added company's IT department and its resources must be resolved.

The merger between the central IT organization and the remote IT department can be triggered either by the IT or by the manufacturing plant. Reasons for the IT organization to trigger an addition of a new remote site could primarily be unrealized economies of scale by the current organization. The remote sites may trigger the process of merging the two IT organizations when they would like to reap the benefits of round-the-clock operations, when they would like to benefit from a larger pool of resources, when they need the results from several large corporate projects to be implemented on their site but they do not have the resources to accomplish all of them at once, when their coordination costs for the IT department rise so that they have to consider other service suppliers.

## **5.2 Acquisition Mode vs. Alliance Mode**

Companies enter into mergers, acquisitions or alliances for various reasons. Some companies' strategy is oriented towards growth and their opportunities for internal growth are limited, so they decide to grow externally through mergers or alliances. The growth can be

---

<sup>2</sup> Technically, the outsourcing providers could be considered as an alternative to the internal IT organization, but for reasons of simplicity we will assume that there is no competition between the two

either a sustained increase in revenues, growth into existing or new markets or getting a larger share of existing customers or getting new customers.

We can argue that when a new remote site is being added to the central organization, it could be done through either an acquisition or an alliance. The two strategies are different in many ways. Mergers and acquisitions are competitive, aggressive, and risky, whereas alliances are collaborative, involve great deal of negotiations, and are less risky. Companies, for example, use mergers and acquisitions when they are aiming at scale increase, when cost reduction is at stake. Alliances are being used when companies are ready to enter new markets or when they aim at new customer segments (Dyer, Kale and Singh 2002). For the IT organization merging with a new remote site (or 'acquiring' the remote site) would mean that the central IT organization takes over the resources under its management. After taking over the resources a standard remote-site implementation template is applied to the new outpost. The alliance would mean that the two organizations create something new from either completely or partially combining the two organizations. It would be difficult to imagine that the large central IT organization would form an alliance with a department which is a fraction of its size. Still, if Alcan were to merge with a new company of a similar size it would be easier to imagine different scenarios at play. Also, some of the remote sites may specialize in certain service areas of expertise that only a part the central IT would be joined with the remote outpost.

This analysis assumes that the local customers are reasonably happy with the performance of their existing IT department. Another assumption made in this analysis is that the central organization is adding only one remote site at a time.

Our analysis method will be based on the framework detailed in the article by Dyer, Kyle and Singh (2002). The framework will be adjusted to fit the internal analysis requirements. This method suggests an analysis of three factors that have an impact on the final decision on whether to execute the addition of the remote site as a merger or an alliance. Those factors are resources and synergies that the new organization desires, the marketplace they compete in, and their organizational competencies at collaborating.

Because the word 'synergies' in the business world is being heavily abused to justify growth by acquisitions we will define its meaning in this document. By 'synergies' we mean the economic benefits that both the central IT organization and the remote manufacturing facility will be able to profit from.

There are number of different resources that both the central IT and the remote IT sites bring to the larger organization. They include the human resources, physical resources, and financial resources. Human resources include the technical expertise of the IT specialists, their knowledge of the local customers and external service suppliers, and the management expertise that includes various processes such as project management, and stakeholder relationships management. The physical resources include the workstations that the customers are working on, the plant networks and the organization-wide network, the applications – both standard and the site-specific applications. The financial resources include the operational budget and the budget allocated for executing projects.

The types of synergies that are expected from the lager IT organization depend on the type of interdependency of the mutual resources. When the central organization's resources are combined with the resources at the remote sites the so called reciprocal synergies are created. Reciprocal synergies are created when resources' interdependency is very high. They have to work closely together and execute tasks through iterative knowledge sharing processes. When reciprocal synergies are expected to be generated the two organizations have to combine the resources in such a way so that knowledge sharing is enabled. In order to prepare resources for the iterative knowledge sharing processes the resources must be customized. For example, the basic software and hardware infrastructure of the remote post must be adapted to the central organizations' infrastructure. In order for the knowledge sharing to happen, the basic infrastructure should be the same. The human resources have to adapt in such a way so that the experts are recognized on both sides of the organization. Once the experts are known to the organization, collaboration framework needs to be established in order to start utilizing their knowledge. The management controls and processes need to be re-examined in order to understand which controls and processes are

going to fit the newly added remote post. Because there is a strong need for creation of reciprocal synergies the acquisition mode will work better.

The resources in their nature can be soft such as the human resources or application software, or hard resources such as the computer equipment and the network. It is important to decide which type of resources would need to be combined in order to achieve reciprocal synergies. In the case where an IT department located in a remote site is added to the central IT organization, the synergy generating resources are more of the soft type. The human resources play more important role in generating the synergies. This is due to the fact that these resources know the local customers. The local resources have established relationships with the customers and they know their business requirements. They already have established processes for communicating with the customers and the local service providers. The local resources also speak the local language which may not be the case with the IT resources from the central groups. Naturally, the local resources are accustomed to the local culture which as we know can be a major stumbling block. There are also resources of a hard type that are being combined. The remote post will probably have to get rid of certain infrastructure because the central infrastructure will become available. But, there is a good chance that the central infrastructure will be supported by the same resources that already do that which again make the human resources more important in this equation. Because the combined resources are more of a soft type some type of alliance should work better. Whenever human resources are being combined alliances should be more suitable because of their less intrusive nature. Acquisitions are competitive and they tend to scare away people working in the acquired organizations. If people do not quit there is a good chance that their productivity will go down.

Very important step in deciding which method of merging the central IT organization with the remote IT department is going to be applied is to estimate the number of redundant resources that will be created. After the process of adding the new remote site to the central IT organization is complete, there could be resources that do the same or similar type of work on the both sides of the organization. The redundant resources can be kept if economies of scale are important, or they can be eliminated in case cost cutting is the priority. In our case

the redundant resources are going to be some of the technical resources that most likely specialize in knowledge related to third-party application software or resources that specialize in supporting basic infrastructure like the network, users' workstations or even some of the servers. Also if the procurement is done within the local IT department those resources may be redundant. Still, there will be resources that are not going to be redundant. These resources could have expertise in areas critical to the company's manufacturing processes. These resources may be used in corporate or locally managed projects. There will also be resources that have valuable relationships with the local customers and service providers and whose skills will be needed in the future organization. We can rate the resource redundancy to be medium which would lead us to the conclusion that alliance would make more sense in this case. If an alliance is formed, then the redundant resources can either be reallocated to other tasks in the IT organization or they could be reallocated to other jobs within the local organization. For example the person that is responsible for IT related procurement can become responsible for procurement in another area of the plant.

Although it appears that the decision on whether to use acquisition or alliance tactical approach depends solely on the 'controllable' factors, other factors such as market uncertainty and competition must be taken into account, even if they are not controllable by the IT management. IT organization's market is internal and their products are the different services provided to internal customers only.

There are two questions whose answers will determine the extent of market uncertainty: are the new services going to work at that particular remote site, and how much are the services of the new IT organization going to be used? The centralized IT organization is still relatively new and the uncertainty that it brings to the remote sites can be rated as medium to high. If we start with analyzing the delivery of support services by the central groups we find mixed results. The relatively simple services like basic infrastructure support should be easier to deliver than the more complex services like delivering new solutions or maintaining customer relations. Consequently the uncertainty related to the simpler services such as the support of the network, workstations and servers should be lower and the uncertainty related to the more complex services will be high. How much demand will be

there for the IT services will depend on factors such as the service reliability, the response time and the quality of the service. The remote site customers will inevitably be comparing the service of the central IT organization with the services of the old local department and they will probably see a lot of advantages that existed during the 'old times'. This could have a negative effect on the demand for the IT services. In this case the alliance would suit more because the IT organization has an option to start small in forming the partnership with the remote site with minimal investments. For example, at the start the central IT organization can offer only services that will create a better perception with the remote site customers when compared to the services of the local department. They can later expand their portfolio of services if everything goes according to the expectations. If the alliance proves not to be meeting the expectations, the central IT organization can choose to opt out of the deal.

The central IT organization's faces relatively moderate levels of competition for its resources. IT being centralized means that it provides the same or very similar services to more than one remote site. For example, a person that specializes in a legacy system will be engaged to serve more than one remote site. That certainly creates a competition for that particular resource. Of course this situation could ultimately be handled by adding another resource to help with the service. The difficulty with the system being a legacy system is that there is a chance that there is a limited number of specifically skilled resources on the market for hire. On the other hand, there are services that do not create competition for resources. For example, if the required service is to perform operational activities for a number of servers in different locations, these services can become a routine for the resources so that there is never a competition for resources. Competition exists mostly at the level of the services that have peaks and valleys such as the support services and project resources. Operational activities, research and development activities do not create high demand during peaks and low demand during the rest of the time.

The results of our analysis (Table 5-1) suggest that some type of an alliance would be more suitable between the central IT organization and the remote sites.

**Table 5-1 Acquisition or alliance - analysis results**

<b>Types of Synergies</b>	<b>Nature of Resources (soft vs. hard relative ratio)</b>	<b>Extent of Redundant Resources</b>	<b>Degree of Market Uncertainty</b>	<b>Level of Competition for Resources</b>
reciprocal	High	medium	medium/high	medium
<i>acquisition</i>	<i>equity alliance</i>	<i>equity alliance</i>	<i>equity alliance</i>	<i>equity alliance</i>

When trying to add another remote site to the central IT organization, the acquisition mentality would be wrong because the IT organization needs help from the local resources to manage the transition. The required help from local resources means that some sort of collaboration is needed to achieve the goals of the new addition. If collaboration from local resources is a must, then the two organizations including the stakeholders would need to enter some sort of negotiations process. Collaboration and negotiations are only possible when the new addition to the organization is handled as a sort of alliance. Also, if this addition was executed as an acquisition, a larger investment would be required up front and due to the high to medium uncertainty that this deal brings it may eventually fail and the whole investment may be lost. Alliances bring lower risk because they can be created with a more limited investment which would ensure a smaller loss for both involved parties. Alliances also allow more flexibility other than financial to be brought into the deal. The remote sites have the flexibility to get only the services they require, whereas the central IT can go after resources that they want out of the deal.

If we look at Table 5-1 we see that the type of alliance suggested is the so-called equity alliance. The difference between equity and non-equity alliance is that in the equity alliance one of the partners makes a relatively small investment into the other partner. In non-equity alliances there is only an agreement between partners to cooperate. No investment is made. In our case an equity alliance would mean the main beneficiary, that is APMG, will need to make an upfront investment into the deal to make the necessary adjustment that will set up the foundation for the change.

So, the question that remains is how are the reciprocal synergies going to be achieved through an alliance? The article suggests that an equity alliance enables creation of sequential synergies. Sequential synergies are achieved when resources from one of the organizations complete their part of the task and then they pass it on to the resources from the other organization. For example, if a support issue arises the local resources would be doing the initial troubleshooting and if the problem is too complex they would have to call the central resources to continue the resolution of the problem. In order to achieve the reciprocal synergies, the IT organization may have to do that in several phases. They may have to achieve the sequential synergies across the board first and then take them up step further. Or they may want to pick certain services where they already feel comfortable based on their experience with previous implementations and achieve reciprocal synergies there and take the rest of the services one step at a time.

### **5.3 Implementation Plan**

Again, implementing an alliance between the central IT and a remote site would actually mean that the two organizations get together and implement a combination of the strengths from each of the parties. In our case, the central IT will bring its value added activities such as strategic planning, major project delivery, and processes related to the support and operations activities. The central IT also adds all the things that come along as a result of their size. The remote sites should bring to the table their customer relationships and possibly influence some adjustments to the various processes that come from the central IT.

We have already mentioned that the problems specific to distributed organizations come from the distance between organizational resources and from the needs to mediate the communication through the use of technology. So, at the same time while they negotiate which side should bring what into the deal, the central IT and the remote manufacturing site's IT department need to work on addressing the collaboration needs starting with a communications framework, a collaboration framework and a knowledge sharing framework.



The implementation plan to add a new remote site to the central IT would be composed of the following steps:

1. Establish a communications framework. Distributed organization issues such as the use of communications technology, organizational issues and issues related to different cultures need to be addressed.
2. Analyze the requirements for services that will need to be implemented. Establish scope, budget, and implementation schedule. Establish quality requirements. Define exit points and the criteria used to analyze the implementation process throughout different phases.
3. Make a decision on whether to continue or not.
4. Implement a collaboration framework. During this phase a stakeholder involvement analysis is performed.
5. Implement a knowledge sharing framework.

Management controls implementation needs to be considered throughout all of the phases. These include organizational structure, progress reporting needs, definition of new roles and responsibilities, adjustment of incentives, change management.

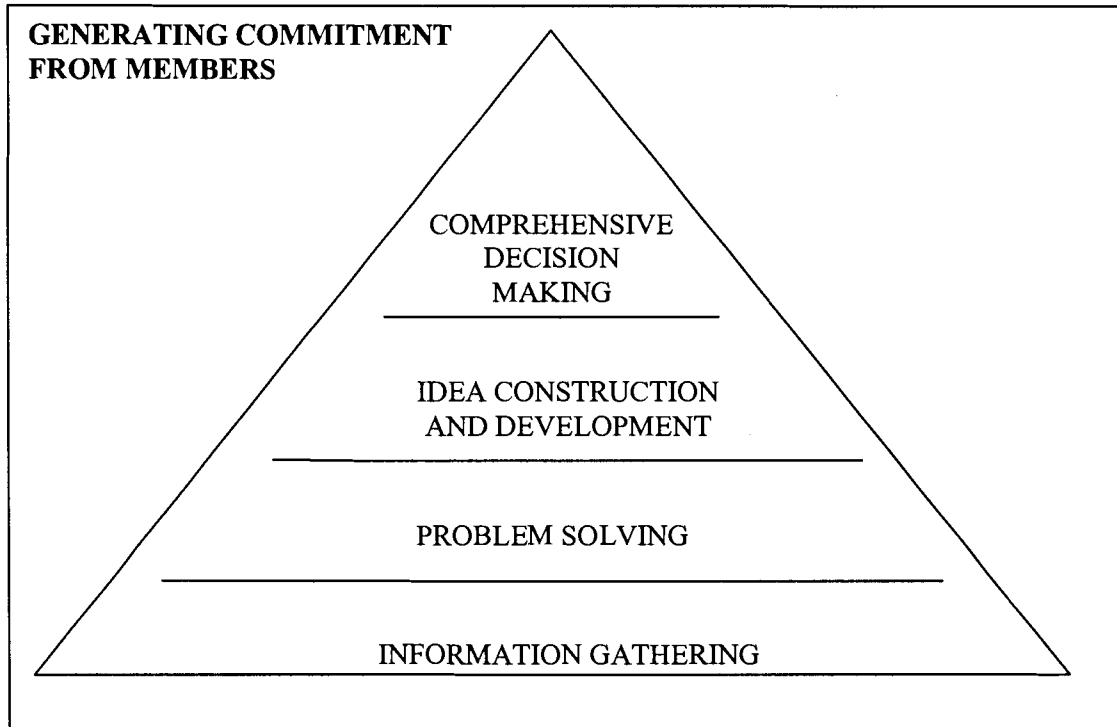
## **5.4 Establishing Communications Framework**

### **5.4.1 Communication Processes and Media**

There are several levels of communication processes. Maznevski and Chudoba (2000, p.481) define a hierarchy of communication processes (or, as they call them decision processes) which is based on the complexity involved in effectively executing the process. Each of the processes that are higher in the hierarchy incorporates the processes that are lower in the hierarchy. In order for the higher processes to be effective each of the lower processes needs to be carried out effectively. The media that should be used for communications between different stakeholders in the process of implementing the remote

site addition is richer as we move higher. The richness of the media is measured by the amount of non-verbal communication that the media can transmit.

**Figure 5-1 Communication process hierarchy**



*Source: Darko Bajkin based on Maznevski and Chudoba (2000)*

At the bottom of the hierarchy is information gathering, which includes retrieval and passing of relevant data. This process is usually performed through a series of questions and answers. For example when a support issue arises the assigned IT resource may be asking his colleagues where is the procedure for solving that particular problem stored. The relevant data must have a clear and unambiguous meaning so that it can be transferred through the communications media. Information gathering can be done using e-mail, telephone calls, and documentation exchange either through e-mail or fax.

The next level in the communication hierarchy is problem solving. Problem solving is limited to solving minor issues and conflicts related to a single task. The process of problem solving requires active exchange between team members. For example, when a support issue

arises the assigned IT resources need to go through troubleshooting that problem. This process needs to be documented in order to be able to reference it back if necessary in the future. Problem solving can be done using e-mail for very simple problems, or telephone for problems where the process required to solve that particular problem needs to be agreed upon.

Idea construction is a process where new solutions and ideas are generated in order to contribute to the individual tasks. The idea construction includes the consequent work involved to develop and implement that idea. This process is more creative than the processes lower in the hierarchy. For example, during a project new ideas are needed on how to design the system that needs to be implemented. This process includes discussions on whether the ideas are worth of further pursuit or not. The process involved in making these types of decisions is fairly complex and it needs to be set before this process starts. The media used here should be context rich such as the telephone or video conferencing, with desktop sharing, or even face to face meetings if the requirements for solving a particular problem are of a high complexity.

Comprehensive decision making includes important decisions related to major issues that span more than a single task, which is in contrast to the problem solving which includes decisions on single task related problems. The process of strategic planning is an example of a comprehensive decision making. These types of problems require high levels of interaction with people being able to exchange non-verbal information. Video conferencing may work but it is always better to use face to face meetings for these types of decisions.

None of these processes will work if there was no commitment from the resources, their management and the customers to pursue the process until the end. That is why the generation of major commitment from members is presented as an all-encompassing task.

Face-to-face communication should be used for generating ideas and making decisions that have an organization-wide effect. Generally, the more complex the problem that needs

to be solved, the “richer” medium needs to be used. Of course, the richest medium for communications is when no medium or when communications happen face-to-face.

Poorly executed communication processes generate conflicts. In the organizational teams three types of conflict arise: task, relationship and process conflict (Hinds and Bailey, 2003, p.616). Task conflict refers to disagreements focused on work content. Relationship conflict (also known as affective or emotional conflict) arises in situations where there are disagreements characterized by anger or hostility between team members. Process conflicts refer to disagreements over the team’s approach to the task, its methods and its group processes.

The relationship conflict is differentiated from task and process conflicts because the relationship conflicts always have detrimental effects on the organizational performance. The task conflict is what usually creates the energy that moves the team and the process conflict can have both types of effects – detrimental or positive. The conflicts that have detrimental effects on the organizational performance should be handled with great care and, if possible, they should be handled during face to face sessions.

#### **5.4.2 Addressing the Issues of Language and Culture**

The issues of language and culture are difficult to be addressed even in co-located teams. In the virtual teams where non-verbal communication cues are missing this problem gets aggravated even more. Both language and culture related issues need to be addressed by performing cultural sensitivity training and later on coaching by either professional instructors or by internal company training services and resources with experience in the area.

When team members that are geographically scattered speak different languages, they have to find a common language to communicate in. If that is not possible, they have to find translators to help them. Otherwise it will be impossible for them to work as a team. Once the common language is established, they need to make sure that they verbalize much more than in a face to face conversation. The extra verbalization is needed in order to make

up for the missing non-verbal conversation. This part is very difficult to learn, so availability of coaching from experienced people is really beneficial.

When people from different cultures work in the virtual environment they need to go through a cultural sensitivity training. Once the training is complete, coaching sessions need to be administered to reinforce the learning. If possible, the cultural sensitivity training should focus on the specific cultures that are present in the team.

There are several things that members of cross cultural teams need to be aware of. They need to be aware that there will be differences in communication behaviors, communication styles, and conflict resolution preferences (Thomas, 2002, p.143). For example, jokes can be detrimental to the trust within the virtual teams, since something that is funny within one culture can be insulting in another. In order to be able to anticipate these types of differences, coaches with experience should be hired during the initial stages or during the most complex and most important communication sessions. Attempts to adapt to the behavioral style of the other culture should also be done with some caution, because the experience shows that aver-adapting to the behavioral style of the other culture can lead to difficulties. Different contextual factors will also have influence over the cross-cultural communications. Some examples include the relationship between the communicating parties, the level of trust between team members, and the size and composition of the team on both sides (Thomas, 2002, p.144).

## **5.5 Remote Site Needs Analysis**

Only once the communication framework is established the needs assessment should commence. The requirements analysis should concentrate on the services that the IT organization should provide to the new customers. Because the IT organization is not capable to cover all the customer requirements, they need to explain their limitations<sup>3</sup>. Each of the services needs to be presented and priced.

---

<sup>3</sup> Service bundling should also be considered as a product marketing strategy

Other than their services, the IT organization also has major centralized applications that it can offer to install at the remote site. The customer needs to be presented with the features that each of the major applications contains. Another IT product is the basic infrastructure. The customer's infrastructure needs to be analyzed and the IT organization would need to determine whether they can actually provide services for that type of an infrastructure and whether they can install their applications on that infrastructure as is.

The services, applications and the infrastructure will form the scope of the project to add the new remote site to the central IT organization. The scope will also need to specify what is going to be excluded and the reasons for the exclusions. The services, applications and infrastructure that are being excluded may be analyzed and consequently a decision would need to be made on whether to include them into the IT organizations portfolio of products. If that is the case, then those products should also become a part of the scope.

The scope will also have to include items related to the collaboration framework implementation as well as the knowledge sharing framework.

The scope then needs to be analyzed and budget requirements will need to be determined. Also the schedule with the timing and resources that are going to perform all of the tasks will need to be included.

The quality requirements will also need to be specified. These should include the quality control and assurance specifications for all of the products that are being implemented.

Risk management plan will need to be developed for the implementation of the project as a whole as well as for each individual product. Risks will need to be identified as assessed on their probability and impact. Then, a proposal on how to handle each of the risks will need to be written.

Exit points are very important to be defined. The first and obvious exit point is after this phase is completed. If the remote site is not satisfied with the service offerings, or if the budget required to implement this new organization is larger than they can take, the project

should be either stopped or revised. The IT organization can also exit the project if some of the services that it normally offers are not feasible to be implemented at the remote site. For example, if the remote site has a different basic infrastructure which is currently not supported by the central organization, the IT organization should probably exit the project unless the customer agrees for the current infrastructure to be adapted to the standard version.

Other exit points should be defined by analyzing the risks related to the implementation of individual or bundles of products. If a product that is very critical cannot be implemented for some reason and if that product's implementation is actually driving the implementation of other products, the whole project should be reviewed and a decision should be made to either stop implementing the whole project or just a part of it.

The customer should have the right to ask for project reviews where decisions to stop or continue the project should be made. These points should be tied with critical milestones for individual products or for the project as a whole. These project reviews should also be happening on a regular basis in order to track the progress of the project.

Due to the size of this project, the scope should be divided into different products and each of those products' implementation should be managed separately.

The implementation of the products for the new remote site should be done in parallel with the implementation of the collaboration framework and the knowledge sharing framework which, on the other hand should be implemented sequentially.

## **5.6 Establishing Organizational Collaboration Framework**

### **5.6.1 Stakeholder Analysis**

Stakeholder involvement is the early and extensive engagement of stakeholders in the process of planning, decision making, and implementation. Stakeholders are those effecting change in the implementation of the new organization and those affected by the new organization. Stakeholder collaboration uses a group of people with sufficient authority to

apply collaborative learning and conflict resolution techniques to formulate effective and acceptable decisions.

The stakeholders include IT organization's management and resources, remote site's management, IT customer representatives, and the local IT department's resources. The IT organization effectively can act as a representative for APMG. They can also effectively represent other remote sites' interests.

In order to minimize the risks, the expectations of all of the stakeholders need to be leveled. At the start of the process clear objectives need to be set so that the process of implementing the new organization is kept on track at all times. Issues like confidentiality, financing of the process, issues related to technical expertise need to be addressed. If necessary a set of alternatives to this process need to be analyzed and presented to the stakeholders. After the interests and expectations have been stated, the parties need to define their roles and responsibilities throughout the process. By assigning roles and responsibilities to specific stakeholders the risk of ambiguity on who is responsible for what is minimized.

If there are any common goals between the stakeholders from the IT organization and the remote site stakeholders, they need to be identified as early as possible. Once identified, they need to be reinforced during the process. This could especially help if there is a difficult issue that threatens to jeopardize the whole process. Identifying the points of conflict as early as possible could help minimize risks of interrupting the process before a satisfactory end is reached. Creating task oriented teams with members from all of the involved sides will help the stakeholders to buy into the process of resolving the outstanding issues.

In order to ensure joint ownership of the decision, open and transparent communications with the stakeholders should take place. The IT organization needs to demonstrate its commitment to the process by providing relevant information to the stakeholders from the start of the process, by providing necessary technical expertise and in some cases supply financial support for independent expertise if preferred by the remote site



stakeholders. The IT organization can also offer help to the remote site stakeholders if they do not have experience with this kind of processes. The resources committed by the IT organization should be available when necessary.

IT organization's representatives are accountable to the management team (both from IT and from APMG). They will be required to submit regular reports on the progress of the whole process. At the same time, they are accountable to the parties involved – their behavior should be in accordance to the Company's Code of Conduct and in accordance to the specified ground rules defined and agreed on by the parties involved in the process.

Milestones need to be established in order to ensure that a progress is being made. As they are achieved a review of the process itself and the achievements to-date need to be performed.

Timelines should be established with an agreement with the remote site stakeholders. This is important if there are limited resources that the IT organization has available to invest in the process, or if it is critical for either of the sides to achieve their interests in a prescribed time period.

Involvement of a neutral mediator that could be either a professional or a person assigned by the APMG management may be considered if the issues are very difficult to deal with or if either side does not have any experience in dealing with a particular issue.

Stakeholder involvement and collaborative decision making require high levels of participation from everyone involved in the process. However, this is not easy, and must be complemented in many cases with conflict resolution. To achieve effective collaboration, a number of conditions or prerequisites are needed, including: good information; time to participate, to build trust, to learn, to resolve disputes, to create solutions; commitment of participants; willingness to learn among participants; shared authority and responsibility to affect and implement decisions.

Conversely, the lack of any of these conditions serves as a barrier to collaboration. Misinformation, insufficient time, lack of commitment and responsibility, entrenched positions, or uneven authority can undermine the collaborative process.

### **5.6.2 Addressing the Issues during the Setup of the Collaboration Framework**

The collaboration is important to be established for several reasons. First, in order to deliver high quality of services and products in the future, relationships between the central IT and the remote site's stakeholders will need to be established. Second, the relatively high uncertainty connected to the implementation of the IT organization's product portfolio needs to be mitigated not only by frequent communications but also by building trust through relationships. Third, during the implementation there is a certain level of redundancy between the resources that needs to be handled with care and with trust in one another. Most of the distributed organization issues are actually being addressed during the setup of the collaboration framework. The issues related to the implementation of the collaboration framework are very well documented in the paper published by Bjørn Erik Munkvold (Munkvold, 1999).

The collaboration framework first would need to be implemented between the existing members of the IT organization. While implementing the organization-wide collaboration framework a care needs to be taken to leave space for the new remote sites to join in. Table 5-2 shows the main stages of the process with a list of issues related to each stage.

The first stage of this process is initiated in the center and executed from the center. The main challenges during this implementation stage include mapping of the local context and specifying the basic technological infrastructure. Before specifying the technology that will be used, a mapping of the existing remote site infrastructure and work practices in each of the organizational units needs to be conducted. The geographical distance poses problems in that it makes this process resource intensive. Since the organizational units that are just being added to the central organization used to be able to make their decisions on the infrastructure and processes independently, there is a good chance that the mix of platforms, experience and competence is fairly heterogeneous. The challenge in addressing and

minimizing the heterogeneity of the mix is to introduce a solution that is flexible and accommodating to all needs. The new and immature technologies can further complicate things because any problems that they manifest through their immaturity may provide the groups that resist changes with a new excuse to justify their resistance. The use of immature technologies should be avoided in time critical implementations.

**Table 5-2 Organizational collaboration framework implementation issues**

<b>Phase</b>	<b>Issues</b>
Initiation	<ul style="list-style-type: none"> <li>○ mapping of the local context, and</li> <li>○ specifying the basic technological infrastructure</li> </ul>
Adoption	<ul style="list-style-type: none"> <li>○ local resistance, and</li> <li>○ alignment of technology and business processes</li> </ul>
Adaptation	<ul style="list-style-type: none"> <li>○ technological incompatibility,</li> <li>○ logistical barriers,</li> <li>○ timing of the implementation,</li> <li>○ establishment of functional pilot groups, and</li> <li>○ organizational instability</li> </ul>
Acceptance	<ul style="list-style-type: none"> <li>○ establishing trust in the new organization</li> <li>○ varying acceptance of different technologies</li> <li>○ establishing incentives for using the new practices, and</li> <li>○ providing guidelines</li> </ul>

*Source: Darko Bajkin based on Munkvold (1999) p.264*

Adoption stage is decentralized. Each of the organizational units goes through this phase individually. If the individual organizational unit decides that the technology cannot be adopted, the process of integrating the remote site should be stopped and re-examined. The main challenges during this implementation stage are local resistance, and alignment of technology and business processes. The goal of implementing the collaboration within and across the organizational units is to make each of them and the organization as a whole more effective. Despite this goal there will always be individual organizational units that will resist the change. This can be attributed to factors such as lack of awareness of communication costs in today's operations, lack of understanding the new infrastructure, and a general focus on short-term goals.

Another important factor that creates local resistance is the reduced autonomy in making various decisions. For example, when a new solution needs to be delivered the organizational unit may prefer to use local resources instead of resources located in the central group because they may have a need to exert more control over those resources. The standardization of the technology and procedures that follows the centralization may also conflict with existing technology and the routines established to support the relations with existing customers and suppliers. Strategies considered beneficial to the organization as a whole may not be considered beneficial for the individual organizational units.

The limited (or non-existing) involvement of the organizational units in the planning and design stages of the new organization is another factor that can create local resistance. The lack of involvement of local customers is very noticeable. Development of standardized procedures for communication and information exchange often does not give priority to the customer involvement. The geographical distance between central planners and designers on one side and the local customers on the other side also has a negative effect on the involvement of those customers. Other negative factors include the IT experience and competence between the local customers, lack of availability of key customers due to their busy schedules, and problems of motivating the key customers to be a part of a planning process related to the future-oriented work practices. Not being included in the initial planning and design stages some local decision makers may feel that the new organization is being forced upon them. The IT departments can also be source of resistance questioning the benefits of the centralization. They are concerned over the new technological infrastructure that is being imposed over them and that they will need to operate and support. Also, the local IT resources suffer from fear of their jobs being lost to the central group.

Organizational units that are already involved in some kind of collaboration with other organizational units have a better chance to adopt the new central organization than completely independent organizational units.

Costs related to the implementation of the centralized organization represent a major concern. Costs to setup the collaboration technologies and processes can be interpreted as

asset specificity costs that are actually transaction costs. The asset specificity comes from the fact that these technologies and processes have almost no use outside of the collaborative arrangement.

Alignment of the new central infrastructure to the local business processes is critical to the adoption of the new central organization. Both the central organization and the organizational units need to pass through a maturation process where an understanding of how the central organization can support the organizational unit will need to be patiently developed. Prototyping could be used as a process that could help steer the new processes toward the right direction. Use of prototyping is encouraged here because of its limited implementation scope and the potentially large impacts.

Once the new organization is adopted, the adaptation phase starts. The adaptation phase of the implementation represents the establishment of connectivity between the center and the individual organizational units and also between the units themselves. Main challenges represent technological incompatibility, logistical barriers, timing of the implementation, establishment of functional pilot groups and organizational instability.

Technological incompatibilities increase the implementation costs. These include incompatibility between different networks, incompatibility between different platforms, applications, and performance problems over the global network.

Logistical barriers are caused by the geographical separation. Initial mapping of the local infrastructure, installation of new infrastructure, training and support of new users are difficult to be performed over a significant physical distance.

Timing of the implementation has to be carefully managed. The project has to be managed carefully because delays in the implementation can cause problems so that for example the installation of the new infrastructure and the training on how to use the new infrastructure can get out of phase.

Centralization of the IT causes organizational instability within the individual organizational units and within the central IT groups. The organizational instability increases the complexity of the implementation. During the implementation, the new organizational arrangement still does not clearly define new roles and responsibilities, and the new processes are just being established. This in turn reduces the ability of the organizational units to make decisions. So, implementing a solid change management processes and eventually an organizational culture is very important in minimizing the impact of the organizational instability.

The acceptance phase has two stages. During the first stage each of the organizational units goes through an individual acceptance. Main challenges during this phase represent establishing trust in the new organization and varying acceptance of different technologies. The second stage of the acceptance includes establishing collaborative work practices among different organizational units. The main challenges during this phase are establishing incentives for using the new practices and providing guidelines.

Establishment of trust in the new organization takes time and a lot of understanding from all of the involved parties. Instability and diminished performance of the new organization often result in users developing mistrust toward the new organization. When new infrastructure is implemented by the central organization the old infrastructure must be removed because availability of substitute infrastructure may give the users an excuse to go back to their old ways of doing things. That could result in lack of critical mass of early adopters which in turn can cause the new infrastructure implementation to fail.

Establishment of new collaborative work practices depends on the incentives for using those work practices. Training is often not enough to force the use of new work practices. If the system of incentives is based strictly on individual achievements, the resources will not be motivated to share information and knowledge.

Guidelines on various collaborative processes need to be developed. The guidelines should include definition of the resource roles and responsibilities, specification of routines that are a part of those processes.

Without establishing the framework for collaboration, the centralization of the IT organization as a whole would either fail or at the least it will not perform to the level of the initial expectations.

## **5.7 Establishing Knowledge Exchange Framework**

Companies in today's economy find that their primary source of competitive advantage increasingly lies in the unique proprietary knowledge they possess. Although the same talent and public knowledge is accessible to everyone, the special value that comes with unique understanding provides a real competitive edge for any company.

The IT function within APMG has resources that cover many different business areas. Some of the resources have deep knowledge of the core manufacturing processes. This knowledge is not easily accessible within the public domain. Harnessing the benefits of this knowledge is a problem that is difficult to solve but that needs to be addressed. Since APMG has a distributed IT organization with IT resources and customers in more than one physical location the problem becomes even more important.

Until recently the companies had two primary ways of capturing their expertise: document repositories and expertise databases. Neither can help seekers of expertise very much. Written documents reflect only a fraction of the knowledge of an expert. Expert databases on the other hand suffer from inadequate classification schemes and tend to be out-of-date very soon after the inception.

For companies with small, simple organizational structures informal social networks have been reasonably effective at putting experts in touch with those who are in need of their service. This we could say applies to the manufacturing operations that used to have their

own internal IT departments. The IT expert resources had their connections with the customers which worked very well.

The problem with the central IT organization is that they have IT resources and especially customers that are geographically dispersed. While creating informal social networks is difficult or even impossible, the good start for the knowledge exchange framework would be the collaboration framework. If we look back at the communications processes we can see that some of the processes located at the top of the hierarchy will be more successful if knowledge sharing was implemented. For example the comprehensive decision making process would benefit from knowing which experts to include at the right time in order to be able to make an informed decision.

To build the knowledge exchange framework, the IT should start by understanding their specific needs. In order to understand their needs, three fundamental questions need to be asked: What specific expertise-related needs do IT resources and customers have? What information will enable them to meet these needs? How will that information be delivered to them? Only when the questions are answered can the IT organization start working implement an effective expertise search system, with or without a third party solution.

Once the knowledge needs are known, there are other questions that should be posed: Whose productivity is suffering from limited access to expertise? In which situations is expertise needed?

While the goal of this paper is not to go too deep into the specificities of implementing a knowledge exchange system, we will consider a couple of points. Expertise can be represented in databases so that it can be available for reuse. Expertise should be identified through experience, its frequent companion. While many point out that the two should not be confused, there is nonetheless a correlation between them. By letting the employees' experience speak for itself, companies can quickly find experts when and where they are needed. Knowledge capture can turn out to be a very political process because of the way the expertise is captured and then the way that information is going to be used.



Knowledge transfer is performed best through socialization, or work in teams with the people that have the expertise. Knowledge flows best between people with similar interests. For example, paired programming has shown to be a very good way to transfer knowledge between two IT experts. Periodic unstructured meetings between experts can help to open up the flow of knowledge within groups of experts.

Without a well implemented collaboration framework, the knowledge exchange framework is impossible to implement. The knowledge exchange framework is very susceptible to lack of trust, cultures, language, status and reward issues ('bigger' experts get bigger recognition), and there is also very low tolerance for errors and mistakes.

## **5.8 Managing Convergence and Divergence Cycles**

Underlying all of the communication and collaboration processes in the distributed organization is the cyclical process that consists of periods of time when resources work together and periods of time when the same resources work on their own. Convergence happens when the organizational teams get together on a periodic basis. Divergence is opposite from convergence. Divergence happens when the teams and individuals go back into their physical locations and perform work that was planned during the convergence phase. During this chapter I will again refer to examples related to my own virtual project team experience.

Different resource perspectives and norms in a distributed organization are created by the inability of the resources working in different locations to share the same context. The different perspectives on what needs to be done to solve a problem may cause task conflicts. Different norms may on the other hand exert negative effect on the convergence / divergence cycles which may lead to relationship conflicts. The bad handling of the convergence / divergence cycle results in a reduced familiarity between team members. Reduced familiarity can lead to disagreements on the approach to be taken to handle a certain problem which causes process conflicts. The reduced trust that has engendered enforces a strong correlation between a task and relationship conflicts.

Convergence and divergence are natural cycles in the distributed organization. Awareness needs to be raised within the organization of the issues that come up as a result of the change in these natural cycles.

The process of making decisions and the process of knowledge exchange should be structured around these cycles. The organization should be able to detect a temporal pattern that should drive the process of making decisions. During the cycle of convergence the intensity of making decisions and charting the action plan should be high. The cycle of convergence should also be driving the knowledge exchange. During the cycle of divergence, the decisions are still made, but these decisions should have limited scope. The scope of these decisions should be limited to the process certain team members are involved in. During the cycle of divergence knowledge is pretty much being created.

During the cycle of divergence the resources conduct their work interacting with members of their respective organizations while contacting the team members of the remote locations only when necessary.

The pattern of the convergence / divergence cycles depends on the level of resource interdependence and task complexity. The types of interdependence moves from pooled where individuals complete their work independently and then aggregate it, to sequential where work moves in a fixed sequence from one person or department to next, to reciprocal where work moves back and forth among people or departments. Higher levels of interdependence require shorter convergence / divergence cycles.

In order to manage divergence attention needs to be paid to the following elements in each of the established processes: expectation management, progress communication, and knowledge transfer.

Managing expectations happens first and usually lasts throughout the whole process. The process in this particular context can be observed at different levels: from developing single applications, to architecting the complete system, to the project as a whole. Progress

communication must be ongoing as soon as the clear establishment of expectations is complete until the point when knowledge transfer is complete at the end of the process.

Expectation management within the team is a very important part of the communication process. Clearing and levelling expectations is very difficult to achieve even in the teams that are physically co-located, so a special attention needs to be paid to this issue. Clear and realistic expectations help driving the task more efficiently towards the end, lowering the possibility of interpersonal conflict, help establishing a strong problem solving and goal oriented team environment, help addressing cultural issues, etc.

Expectations have to be discussed and established at many different levels during the execution of a task.

Expectation management should start right at the beginning of the task, during the kick-off meeting, when the goals and objectives are being established. Every team member should try to express their expectations and a short discussion should follow to make sure a consensus is reached. For example, during one project we had to define the objectives as to what it meant for the system to be robust (there is a 'small' difference between a space shuttle system and a manufacturing control system), what it meant for the system to be maintainable, etc. These expectations should be continuously adjusted through discussion with other stakeholders, such as members of related teams, customers, and other stakeholders in the IT organization. These expectations should also be cleared even more when some of the objectives are applied in reality –e.g. during the application design and implementation.

Establishing expectations for each task helps spending the right amount of time and effort on that particular task. Some of the aspects that have to be cleared include the criticality of the task, the risks involved in the completion of the task, the amount of time each of the resources is expected to spend on the task, the level of quality assurance the task requires.

The expectations of the resource availability have to be managed by constantly exchanging information on each other's availability. During the same project, at the beginning of each of the daily teleconferences we established a rule to communicate the availability of each of the resources for the day. This helped the efficiency of the meetings because the activities could be planned better. Decision making on the important issues was done by reaching consensus from all of the team members. If a certain team member was not present, even the discussion of the issue was suspended until that team member was present.

Communicating progress on the activities that are happening in a divergent mode is also important. Communicating progress helps level the expectations of the various team members, keeps everyone informed on the issues going on, facilitates later knowledge transfer. The frequency and detail of the information shared during the progress report should be left up to the person working on the deliverable, but they should typically happen between once a day and once a week.

The transfer of knowledge can be achieved through several different means. For example, joint high level and detailed design activities can help keeping the high level system knowledge at the same level. At the same time these activities also facilitate the sharing of the detailed knowledge. For example, during the project we found it was much easier to share knowledge like programming tricks if everyone was involved during the design process. The opposite was also true. Constant code reviews helped transferring the detailed programming knowledge and setting a common direction for the team in terms of the coding standards.

Paired programming is another efficient way of knowledge transfer. While it helps transferring the programming experience, it also works at the level of establishing common coding, design and documentation standards. Paired programming as a means for knowledge transfer helps the quality of applications and the level of confidence to rise as project work progresses.

## 5.9 Implementation of Managerial Controls

Two of the largest problems that a distributed organization must face are the problems of communication and coordination. The lack of face-to-face interaction creates obstacles that may impair team effectiveness. Increased level of communication and task uncertainty management is required in the distributed organization environment. Successful distributed organizations engage in extensive and predictable communications patterns, display high task goal clarity, superior time management skills, and alertness to deadlines (Piccoli and Ives, 2000, p.3).

The organizational structure of the IT organization will need to be adapted to the needs of the IT professionals. In order for them to be productive and in order to be able to freely exchange their knowledge, the IT resources need to be allowed to openly collaborate with each other.

The organizational structure where resources are organized in silos does not allow them to collaborate with resources outside of their own silo. A vertical structure such as a silo forces the professionals that need to cooperate with other professionals to search across poorly connected silos to first locate knowledge collaborators and then to gain their cooperation. An organizational structure such as a matrix forces the IT resources that are searching for collaborators to first go up the hierarchy and then across, which makes matters even more complicated.

In order to allow the IT professionals to be more productive by enabling collaboration and knowledge sharing to happen the silo based organization needs to be avoided. The matrix organization also does not work for the IT organization. The best organization is probably the one where the IT professionals are concentrated around their services, like the customer relationship service, the project delivery service, and a support group. The current IT organization is pretty much structured this way, which means that the basic prerequisites for collaboration and knowledge sharing have already been implemented. This way the organization is structured around the interests of its professionals so the collaboration and knowledge sharing are possible.

The structure of the support and operational teams should be more hierarchical because of the greater need to manage costs. Three related factors determine the cost structure of an organization's support functions: capabilities specify what an organization can do, demand indicates the extent to which those capabilities are used, and efficiency shapes how well they are delivered (Nimocks, Rosiello and Wright, 2005, p.2).

The project and planning functional teams should have a flatter organizational structure due to the need to develop flexible and generalized resources.

As the new organization is being formed, new roles and responsibilities must be clarified for both the organization as a whole, the individual teams and the individual resources.

Sometimes an organization may have the perfect structure and process design in place, but still have performance problems. Many times these problems are related to the performance incentives structure. The performance objectives for the IT professionals should be set so that they reflect the strategic goals of the IT organization. For example in order to encourage collaboration and knowledge exchange practices, the IT resources may have objectives such as to perform at least one presentation for their peers where they will be able to share their knowledge.

Change management is another part of the organizational culture that needs to be established. Change control processes where the stakeholders are assigned to a certain application, hardware or even a process in order to control a change. Communication processes to share the information on the change process are also critical. The people that need to know about the change are usually a wider group than the group of people that are involved in the change control process.

## **6 RECOMMENDATIONS AND CONCLUSION**

This document contains an analysis of the issues related to the problem of adding a new remote outpost to the central IT organization within APMG. While analyzing the steps required to add a new remote outpost we have paid attention to design of the implementation process and also to the sequencing of the required implementation steps. The following paragraphs contain recommendations related to this process.

Before even starting the implementation process an analysis of the strategic fit and the economic benefits will need to be performed. This analysis should determine if the remote outpost needs can be satisfied by the service package offered by the central IT organization. It should also determine whether the IT organization and APMG as a whole would be able to benefit from the increased economies of scale, greater learning effects, greater power over the suppliers of services, and also whether the addition of the new remote organization will lower the coordination costs.

Once the decision to add the remote site is made, the process that ensues should be performed as if creating an alliance between two companies. An investment by APMG should be made up front in order to ensure financial support to the implementation process. Resources should be committed by both the APMG and the remote site to help continuously drive the execution. The main advantages of the alliance approach are its tolerance for uncertainty around the product usage, and the lower level of investment required up front when compared to the more aggressive acquisition approach which requires higher level of investment up front.

In order to handle issues related to the distributed organizations such as the spatial and temporal barriers, issues related to communication technology, organizational, cultural issues and the potential loss of trust, processes of communication, collaboration and eventually knowledge exchange will need to be established.

I recommend that the process for implementing addition of a new remote site is managed as a project with a full time project manager. The project mode will ensure that the resources working on the problem are dedicated, and that there is a formal budget, scope and schedule. Quality of the implementation should be measured by taking a snapshot of the situation before the implementation and use that as a benchmark throughout the duration of the project. The benchmark should also be performed after the project is complete in order to evaluate the success of the project. The post mortem of the project should be used to learn valuable organizational lessons and potentially to acquire competencies for adding more remote sites.

The implementation sequence should start with establishing a communication framework. This should establish the various communications processes whose goal is to generate commitment from the involved parties. At the same time the communications media usage should be established according to user preferences and the required level of the communication. This would be a good time to go through a cross cultural sensitivity training and coaching. Also, the language issues will need to be addressed by identifying resources that will be used as mediators in the communications process.

Once the communication framework is established, detailed analysis of the needs of the remote site's customers should be performed. During this phase the detailed scope, budget and schedule should be developed. The needs analysis should include the types of services that would need to be provided to the customers, quality requirements for the implementation, and a detailed project risk management plan. The project scope must include project exit criteria, that should be verified by the project steering committee will at various points defined in the schedule.

If the project gets approved, the next phase should be to establish the collaboration framework. The first step would be to perform a stakeholder analysis where the ground rules for the collaboration process are going to be established. The collaboration framework can be implemented in four phases, which include initiation, adoption, adaptation, and acceptance of



the framework. Each of the phases contains issues that are specific for that phase and that need to be addressed separately.

The final phase of adding a new remote site to the IT organization would be to implement a knowledge exchange framework. The main driver for the implementation of the knowledge exchange framework should be an increase in productivity within the IT organization. The knowledge exchange framework should be based on the identification of the specific expertise within the organization, and on the needs for information and knowledge exchange.

As the project progresses managerial controls need to be implemented. The organizational structure needs to be different for the different parts of the organization depending on the need for establishing cost control or on a need to allow the resources to use their creativity when developing new systems. The incentives for the IT management, IT resources (both central and remote), and even the incentives for the customers at the remote sites need to be designed so that they foster collaboration and knowledge exchange. Change management should become a part of the organizational culture by establishing change control processes and information sharing processes, and also by increasing awareness of the existence of stakeholders that are being affected by the changes.

Before implementing the central IT organization at the new site measures should be taken to understand the current status of affairs and to understand the expectations of the users. That is an opportunity to develop a system of understanding the current level of service and the user satisfaction. Also, the IT organization should consider designing bundles of services in order to fit different needs. If possible, and if necessary, services should be bundled up so that different remote sites can benefit differently from the services of the centralized IT organization.

Next steps would involve refining this framework by including the lessons learned. Although it is to be expected that each implementation would be different, it is important to refine the framework in order to be able to develop the necessary competencies within the

company. If the framework proves to be useful, it could then be applied to other overhead functions such as the engineering, accounting, financial services and Human resource department.

## Reference List

- Adams J.R., and Adams L.L (2002). The Virtual Project: Managing Tomorrow's Team Today. *PM Network, PMI*. Vol. 11, Number 1.
- Alcan Inc. 2004 Annual Report (2005)
- Alcan Corporate History (2003). Retrieved July 17<sup>th</sup>, 2005 from [http://www.publications.alcan.com/landmarks/en/pdf/en\\_full.pdf](http://www.publications.alcan.com/landmarks/en/pdf/en_full.pdf).
- Alcan Inc. Web Site (2002). Alcan and CGI to Sign a Long-Term IT Outsourcing Agreement Retrieved July 17<sup>th</sup>, 2005 from <http://www.alcan.com/web/publishing.nsf/Content/Alcan+and+CGI+to+Sign+a+Long-Term+IT+Outsourcing+Agreement>.
- Bell M., and Frey N. (2002). Virtual Teaming: 10 Principles for Success. *Gartner Strategic Analysis Report*. 16 September 2002
- Benson-Armer Richard and Hsieh Tsun-yan (1997). Teamwork Across Time and Space. *The McKinsey Quarterly*. Vol. 1997 Number 4 pp.19-27.
- Bryan Lowell L., and Joyce Claudia (2005). The 21<sup>st</sup>-Century Organization. *The McKinsey Quarterly. Web Edition*. Retrieved June 30<sup>th</sup>, 2005 from [www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)
- Cecere Marc, and Rosenberg Mark (April 21, 1999). The Challenges of Managing Geographically Distributed Organizations (Thematic Planning Assumption). *GIGA Information Group*.
- Dyer Jeffrey H., Kale Prashant, and Singh Harbir (2002). When to Ally When to Acquire. *Harvard Business Review*. July August 2002.
- Hinds Pamela J., and Bailey Diane E. (2003). Out of Sight, Out of Sync: Understanding Conflict in Distributed Teams. *Organizational Science*. Vol 14, No. 6, November-December 2003, pp. 615-632.
- Kaplan Robert and Norton David (1993). Putting the Balanced Scorecard to Work. *Harvard Business Review*. September-October 1993 pp. 134-142.
- Maznevski Martha L., and Chudoba Katherine M. (2000). Bridging Space Over Time: Global Virtual Team Dynamics and Effectiveness. *Organization Science*. Vol. 11, No.5, September-October 2000, pp. 473-492.
- Molli Pascal, Skaf-Molli Hala, and Oster Gerald (2002). Divergence Awareness for Virtual Team Through the Web. *Society for Design and Process Science*.
- Munkvold Bjørn Erik, (1999). Challenges of IT implementation for supporting collaboration in distributed organizations. *European Journal of Information Systems*. No. 8, pp. 260-272.
- Nimocks Suzanne P., Rosiello Robert L., and Wright Oliver, (2005). Managing Overhead Costs. *The McKinsey Quarterly. Web Edition*. Retrieved May 17<sup>th</sup>, 2005 from [www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)
- Piccoli Gabriele, and Ives Blake (2000). Virtual Teams: Managerial Behavior Control's Impact on Team Effectiveness.

Reid Douglas (2005). Don't Compete, Collaborate. *Article on the Export Development Canada web site*. Retrieved June 15th, 2005 from [www.edc.ca/corpinfo/pubs/exportwise/spring04/p04\\_e.htm](http://www.edc.ca/corpinfo/pubs/exportwise/spring04/p04_e.htm)

Samuelson, William F., and Marks Stephen M., (1992). *The Managerial Economics*. Second Edition. The Dryden Press, Harcourt Brace College Publishers.

Thomas David C., (2002). *Essentials of International Management*. Sage Publications