

# **The Localization Outsourcing Decision**

**A dissertation submitted in part-fulfillment of the requirements for the degree of  
Master of Business Administration of the University of Warwick**

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**March 2002**

## Executive summary

### **Purpose**

This paper investigates the question of whether localization outsourcing is the optimal solution of increasing capacity. Three alternatives are analyzed and compared:

- Outsource localization completely, and change the role of the staff to relationship and vendor managers
- Increase headcount
- Do nothing, and not meet the desired capacity increase

The purpose of investigating this subject is to address the regional requirement for increased localization scope, and improved turnaround. Meeting such requirements would constitute an improvement of the quality of service offered to the regional offices, which is inherently desirable and worthy of attention and effort.

### **Results**

A model for the decision is developed and constructed, taking into account criteria set by the stakeholders, and then evaluating the three alternatives in context. The recommended alternative is to outsource, and is robust to sensitivity analysis and various uncertainties inherent in the decision. The relative overall benefits outweigh the costs.

### **Risks**

The key risks of the decision are:

- The reduction of the strategic flexibility
- The potential impact on human resources
- The risk of local vendor contracts
- The risk of loss of the opportunity to re-engineer

### **Recommendations**

While the analysis reveals that outsourcing is the optimal way forward with regard to the goal of increased capacity, some issues need to be taken into account before the decision is made. These are:

- Goal review: If the purpose of increased capacity is to increase profitability, then alternative methods of increasing profitability need to be investigated. Such methods include process re-engineering and more robust ROI and RI project selection criteria.
- Certification resources: While capacity and other operational efficiencies can be increased through outsourcing, the regional offices cannot meet the increased requirements for product certification. Provisions must be made for additional resources, whether internal or external, before capacity increase is attempted.

In addition to the full outsourcing solution, hybrid alternatives can be used to increase capacity, such as outsourcing more, but not all possible localization functions. Such a change could be implemented simply by redefining the communication matrices, and putting the suppliers in direct contact with the other internal groups. This could free up internal resources to pursue process re-engineering.

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## Introduction

### Background

My employer is an American company with 1300 employees worldwide and an annual turnover of \$230m. It publishes engineering software, and provides associated services such as consulting, engineering collaboration portals, subscription-based technical support, and development support.

All of its eighty software modules are developed in English, and about twenty-five of these are subsequently translated to up to fourteen languages, for the international market, accounting for 22% of its gross product revenue. The product portfolio includes interdependencies, with some generic products, whose functionality is expanded with specialized vertical application modules. The core products have at least one major version per year, and typically intermediate updates as well.

The languages are roughly divided into three tiers, depending on the market size for the company's products. Tier 1 are the FIGS languages (French, Italian, German, Spanish), Tier 2 is Czech and Polish, and Tier 3 is Hungarian, Russian, Finnish, Portuguese, Dutch, Danish, Norwegian and Swedish. This paper does not take into account the localization for the Asian market, which is handled locally.

Each year new products are added to the product portfolio, with varying demands for localization. The development of new products results from the success of the base products, which generates more demand for vertical applications, and in some cases from acquisition of other companies or their technology. The take up of the new products varies in speed and intensity in each country, but as rule Localization demand increases each year by 50-100%. The additional demand is currently not met.

The Localization staff of three has a capacity of about 100 projects per year, while the project requests are almost 300 for 2002. The two localization project managers in Europe focus on European languages and specialize by product. Furthermore, they have a geographical region allocated to them, for which they have a customer care responsibility. This dual-role model bridges the market-operations gap by allowing product specialization and easier resolution of technical queries, while aligning the group with the corporate customer focus. The group engineer focuses on resolving the more complex technical issues, and optimizing the processes.

Localization itself is already outsourced; the translation is handled by external localization vendors, typically MLVs (Multi-lingual Vendors), each handling a group of product-language combinations. Long-term relationships are built with these vendors, and as long as there are no insurmountable difficulties, the same vendors are awarded the translation of all future versions of a given product-language combination. This enables the vendors to develop knowledge of the product, which makes them more productive. New products are awarded either based on language specialization, or based on availability of resources. Some SLVs (Single-language vendors) are also used, primarily for second and third tier-languages. In the case of Czech, a re-seller handles the translation, and in the case of Finnish, the translation is performed in-house.

During the translation, vendors create sentence memories, essentially dictionaries of phrases, which can subsequently be leveraged automatically or semi-automatically to reduce costs and time to markets, with each new release of the same product. Typical leverage from version to version is around 70%. Essentially vendors can focus on the remaining 30%, which is either new or changed. Where an identical occurrence of the phrase is not found in the

### Glossary

**Localization (L10N):** the process of adapting a product for local use, by translation, and conversion to local standards. For example, the user interface of a product can be translated, and the symbol libraries can be converted to local standards; a 2"x4" beam in an ANSI library will be converted to a 5x10 (cm) beam in a DIN library, rather than 5.08x10.16 cm which would result from a unit conversion alone.

**Internationalization (I18N):** the process of designing and developing the source materials in way that enables, and facilitates localization. For example, by keeping all translatable message strings external to a program code, the translators cannot break the code by mistake during translation, do not have to search through the code for translatable messages, and the code itself, being proprietary does not have to be seen by parties external to the organization.

**Transkit:** (Translation kit): The set of source materials, instructions, tools and reference materials needed to localize a product.

sentence memories, a fuzzy (partial) match may be presented to the translator, who can then edit as necessary.

Customers of the internal service of localization are the regional offices in each country. The service is market focused, where source materials of varying specification need to be localized. For example for one core product, the GUI (Graphical User Interface) may be translated, in addition to the on-line help, and the printable documentation. For a secondary product, only the GUI may be translated, and perhaps also some components of the help system.

While the budget acts to set the scene for regional expectations, it is typically the internal bottleneck that prevents the 300 requests from being full-filled. In the past, projects were evaluated on a ROI basis. With the regions now free to choose however many projects they want, with only the budget limiting their choice, demand for product localization has increased. Essentially they can now use Residual Income as the project qualification criteria, but can also localize a product as a strategic investment. Further, most of the end-customers are subscribed to Select, a support program that offers free updates and upgrades, as well as fast turnaround on technical support. Once a product is translated, deciding to not translate the new versions is seen as bad service in the international market, because it puts non-English speakers at a disadvantage to the English speakers, while their Select fees are the same. Therefore, progressively more often, localization is cited as necessary to ensure quality of service.

## **Purpose**

Customer satisfaction reviews revealed that our internal customers want more products to be localized, more often, and to be released more quickly after the English release. No major quality issues were raised, and therefore improved performance in this context means increased throughput. Management has also explicitly expressed this expectation. Purpose of this work is therefore to evaluate whether an increased level of outsourcing will improve performance without introducing an unacceptable level of risk, while at the same time maintaining compatibility with the corporate strategy in a customer-centric organization.

Out of many possible sourcing alternatives, the current model is based on history rather than deliberate choice. Other models could be more appropriate, due to technology changes, corporate strategy shifts, growth of business, or because of the industry maturing, and opening up new opportunities or presenting new challenges.

Increased level of outsourcing is just one of the ways in which capacity can be increased. Increasing headcount is another. Process improvement is a continuing effort, and has been successful in increasing performance to a degree, and on occasion dramatically. For example recent changes in the product engineering and testing has cut down the engineering and testing time on the vendor side by as much as 75%. Improvements in the internal bottlenecks have been nowhere as spectacular though, because new projects are often unstructured, and do not facilitate automation. Standardization is an on-going negotiation and education of the people who create the source materials, and results typically take more than a year. The alternative of passing the localization of responsibility to the regions is also not investigated here, because it is company policy to maintain a centralized localization service.

## **Scope**

The questions it will attempt to answer are:

1. Should we outsource?
2. What functions, tasks, or responsibilities should we outsource?
3. How should we outsource?

## Literature review

### Outsourcing

Outsourcing is a subject generally well referenced in the literature, but most of the literature focuses on advantages, disadvantages, and risks, i.e. the decision to outsource, but not the methodology and the post-implementation management.

Even the risk aspect is not covered to a great extent. Outsourcing methodologies, and the post-implementation management are starting to be explored only more recently. The reason for this could be that so many outsourcing decisions are based on the optimistically long list of advantages, along with a shorter list of disadvantages, and finally a list of risks, which managers may discard with "this won't happen to us". Failed outsourcing implementations are therefore raising the need for more complete methodologies, alongside post-implementation management and strategies.

### Definition

While there is general agreement in the literature that outsourcing has advantages and disadvantages, outsourcing itself has been defined in various terms.

Hiemstra and van Tilburg (1993) define outsourcing as: Subcontracting custom-made articles and constructions such as components, sub-assemblies, final products, adaptations and/or services to another company. The focus here is on manufacturing. Embleton and Wright (1998) distinguish between outsourcing (long-term) vs. contracting out (job-by-job). This distinction is not typically made in the literature. The more standard definition is "the procurement of products or services from sources external to the organization" (Lankford and Parsa, 1999). Some definitions focus on the mode change, when an internal activity is outsourced.

An outsourcing characteristic not typically captured in the definitions found in the literature is that the activity itself may be handled internally to the organization or outsourced. For example, when a software company uses a catering company or a travel agency, is not normally considered as outsourcing, because this activity is beyond the scope of the core business of the software company, no matter how strictly or loosely it is defined.

Seen from the perspective of strategic flexibility, outsourcing is just one way in which the boundary of the firm can be adjusted in response to changing economic pressures. It may concern either a firm's primary supply chain or chains – in which case the practice is part of determining a firm's level of vertical integration – or it can concern its support activities (Lonsdale and Cox, 2000).

Because of the growing interdependence of companies and even industries, the strategic flexibility perspective becomes increasingly important.

### Advantages of outsourcing

There is no single source in the literature, covering all the potential benefits of outsourcing. However, there are common threads, roughly matched to the Operations, Strategy, Marketing, and Organizational Behavior perspectives. These are:

- Efficiency, improvement of operational performance
- Strategy, flexibility to redefine the organization
- Image, how the operation looks in the books or to the stakeholders
- Human resources and Politics, to enhance someone's career, to eliminate someone, or to reduce conflict

### Operational efficiency

Blumberg (1998) notes that labor-intensive businesses with steep learning curves are among the ones that can benefit the most. Operational efficiency is the traditional motivation for outsourcing, with cost reduction as the primary concern.

**Cost**

Cost performance (McFarlan and Nolan, 1995; Embleton and Wright, 1998; Hiemstra and van Tilburg, 1993) can be improved through reduction of fixed and variable costs. Most of the authors do not distinguish between the two, because the benefit is not always obviously more applicable to fixed rather than to variable costs. For example, Akomode *et al.* (1998) refer to access to technology, which could reduce both the variable costs as a result of economies of scale and scope (Akomode *et al.*, 1998; Downey, 1995), as well as the fixed costs, through reduction of capital expenditure (Downey, 1995; Lonsdale and Cox, 2000) and risk of obsolescence (Embleton and Wright, 1998).

One area not adequately covered in the literature, is the potential tradeoff between fixed and variable costs. For example, the benefit of reducing fixed capital costs can be easily offset by an increase of variable costs, resulting from the inclusion of profit of the external supplier in the work rates, in a situation where the outsourcing company would be equally efficient.

The benefit from supplier's investment and innovation (Lonsdale and Cox, 2000), and access to skills (Downey, 1995; Akomode *et al.*, 1998; Embleton and Wright, 1998) can improve both cost performance as well as productivity (speed). Again here there is another potential tradeoff. Quite often an external company may be awarded a project at higher cost than could have been managed internally, simply because it cannot be completed in a timely manner.

Some of the more insightful views on the cost savings are from re-engineering, as hidden costs are revealed and documented during the specification of the required service (Embleton and Wright, 1998), potentially access to group purchasing discounts (Downey, 1995), access to local factors such as geography (Embleton and Wright, 1998), and reduction in training needs (Downey, 1995).

Akomode *et al.* (1998) distinguish between operational and management costs, and some authors attempt to quantify the total cost reduction. Blumberg (1998) estimates that outsourcing can lead to 20%-40% reduction in costs, while Lankford and Parsa (1999) are more conservative with "at least 15%, and sometimes 20-25%" savings. However, Anfuso (1996) warns that fewer than half of the companies achieve a reduction in overall expenditures.

**Speed**

Brown (1998) found that even where there is no reduction in costs and staff, the increased productivity could improve the throughput and therefore the quality of service. However, Anfuso (1996) warns that less than one quarter of the companies that outsource, actually show increased productivity. This could be because the estimates are overoptimistic, or perhaps because of the increase of the number or the complexity of the transactions, between the outsourcing company and the supplier.

Speed improvement is generally accepted as a fundamental benefit of outsourcing, cited as improved time to market (Lonsdale and Cox, 2000), improved performance (McFarlan and Nolan, 1995), greater productivity, time savings and reengineering (Embleton and Wright, 1998).

**Dependability**

Drucker considers in-house service and support activities to be defective monopolies, which have little incentive to improve their productivity. The implication is that despite the potential cost increase from potential higher unit work rates, the external supplier will be both more productive, as well as more dependable. Embleton and Wright (1998) agree, that since the relationship is contract-based, accountability is likely to be higher.

Fundamentally the issue of dependability encompasses not only operational, but also human resource issues, and even strategy, in the context of core business. It is easy to see why commitment to colleagues may be more easily broken than to outside parties, where the contractual performance may suffer, and the long-term collaboration may be jarred.

**Quality**

Many authors cite quality as a motivation (McFarlan and Nolan, 1995; Embleton and Wright, 1998; Akomode *et al.*, 1998), implying that it would be the better skill set of the external supplier, the contractual obligation to meet quality standards, the necessity of even setting quantity standards, and the lack of discretion in "cutting corners" which may result in increase of quality.

A quality fault found before a product is delivered is cheaper to rectify. When an external supplier delivers a faulty product, their cost of recovery is increased. Therefore, in addition to the reasons mentioned above, external suppliers would favor higher quality if only to reduce the costs of rework, which obviously would not be part of the per unit work agreement.

Further, the supplier prestige rests on the quality of the work delivered, and the quality product can act as a promotional material.

Finally, when the processes of quality assurance and quality control are variable cost tasks, the supplier would have every motivation to maximize these tasks, in an effort to both maximize the revenue as well as the quality.

### **Flexibility**

Embleton and Wright (1998) cite greater flexibility, while McFarlan and Nolan (1995) cite simplified management as a motive. In fact, many of the flexibility benefits are associated with long-term strategic rather than short-term operational flexibility (Brown, 1997). However, outsourcing can obviously benefit during demand fluctuations (Hiemstra and van Tilburg, 1993; Fill and Visser, 2000), with JIT employees (Downey, 1995).

### **Strategy**

While focusing on core business is one of the most popular reasons cited for outsourcing (Peters and Waterman, 1982; Winkleman *et al.*, 1993; Downey, 1995; Quinn *et al.*, 1990; Akomode *et al.*, 1998; Embleton and Wright, 1998; Lonsdale and Cox, 2000), Lacity and Hirschheim (1995) argue that few organizations take the strategic approach to sourcing, and prefer instead to pursue benefits from incremental, selective, low risk approaches. This could be either because “strategy” is so often used as an argument to bypass the need to actually prove any benefit, or because the people involved in the outsourcing decision may have an operational rather than strategic perspective.

Undoubtedly there is an aspect of strategic flexibility, where by externalizing part of the operation the organization can become more responsive to the market. McFarlan and Nolan (1995) and Embleton and Wright (1998) also cite corporate culture as a motivator, which means that the outsourcing decision is not always rationalized, or at least that the rationale is biased by the culture rather than strictly financial.

One of the reasons particularly applicable to alliances rather than simple outsourcing agreements is risk sharing (Akomode *et al.*, 1998).

### **Image**

How the operation looks “in the books” is a reason cited often. Lonsdale and Cox (2000) refer to converting fixed costs to variable, Beulen *et al.*, (1994) refer to bypassing budget limitations, and Downey (1995) cites bypassing limitations in headcount using outsourcing (Downey, 1995). Since all of these can actually increase rather than reduce costs, they can be seen simply as manipulation of the internal image.

Externally, the image can be enhanced as a result of the higher profitability per head (Embleton and Wright, 1998), assuming the variable costs do not escalate, or more generally as generally “a good thing”: The PA Consulting Group (1996) see as effective management practice.

### **Human resources and Politics**

Some authors cite political reasons, such as eliminating an irritant (McFarlan and Nolan, 1995), or improving cooperation, where for example outsourcing reduces the potential for internal conflict (Beulen *et al.*, 1994; Embleton and Wright, 1998).

Clearly, the people involved in the decision may introduce bias the outsourcing decision. A manager with empire-building aspirations may emphasize the risks, in hope that additional resources will be allocated to his control; one who prefers to manage contracts rather than people will eagerly consider any outsourcing opportunity, since he will no longer have to worry about motivation, compensation, and internal conflict, leaving all of the HR headaches to the external supplier. Further, the role change from operations management to contract management, vendor management, and relationship management, may be seen as career enhancing.

## Disadvantages and Risks of outsourcing

Despite the long list of advantages, the PA Consulting Group (1996) reports that only 5% of managers felt that the outsourcing arrangement had met its objectives, with the majority reporting a mediocre outcome. However, the results from a study by Struebing (1996) indicate that 91% of the outsourcing companies are satisfied with the results. The difference between the two does not seem normal. Bias is likely to come into play here, depending on who is asked, and how success is measured. The manager who championed the outsourcing would be more hesitant to admit that the benefits were not achieved. Often, a different person manages the outsourced operation than the one who drives the decision. Their criteria of success could be different. And even without bias and a different scale of measurement, where exactly is the line between success and failure? If the expected cost savings were 30%, but the achieved savings were 15%, the outsourcing decision may have failed to give the anticipated cost benefit, but it was not necessarily a bad decision.

## Operational efficiency

### Cost

While the direct costs may be lower in an outsourcing scenario, the combination of the contract costs, the costs needed to support the relationship, and the outsourcer profit may make outsourcing more expensive (Embleton and Wright, 1998; Akomode *et al.*, 1998).

Downey (1995) and Lonsdale and Cox (2000) point out the risk of being leveraged by suppliers, particularly when outsourcing into a limited supply market (Lonsdale, 1999). They claim that having assured the business within the scope of the contract, suppliers may pursue additional services, at additional cost (up selling). This can lead to cost escalation. The types of services they are likely to pursue will be higher margin services, such as consulting, business process reengineering, and distributed support and application development, with profit margins of 15% and above, where the average profit margin for all outsourcing services is estimated to be between 10-12% (Terdiman, 1996).

The potential conflict of interest is clearly there, because for example a supplier may not be as motivated in maximizing process efficiency within the context of a consultancy contract, if this would mean reduced project-related revenue. Further, there is a potential issue of trust, ignored by the literature: if the consultancy contract brings a dramatic improvement in the client performance through re-engineering, can it always be assumed that the potential benefit from the re-engineering proposed from this contract was not known in advance, for example as a result of other similar consultancy projects, or just experience?

In any case, up selling is not necessarily a problem, a failure, or a risk of the outsourcing agreement. The additional services can be very valuable to the outsourcing company, as well as competitively priced. Therefore there needs to be a distinction regarding cost escalation, which can be assumed to mean that the same service becomes more expensive, rather than the outsourced service portfolio increases, along with a predictable increase in cost. Up selling could be in fact a sign that the outsourcing operation was very successful, and is leveraged progressively more, to the benefit of both companies.

### Speed

In outsourcing, there is the risk of interruptions of supply, or capacity limitations (Downey, 1995; Embleton and Wright, 1998; Lonsdale and Cox, 2000). Having assured the revenue, the supplier will attempt to reduce costs, by using cheaper resources, or at least managing capacity in a way that is most cost-effective. Therefore, the anticipated speed, based on the assumption of the supplier scale of operations may not materialize. Further, while internal resources may be committed to the project, and not subject to conflicting demands, vendors may face more severe demand fluctuations, exactly because of the increased scope.

### Dependability

Monitoring and evaluating the performance of vendors is difficult (Blumberg, 1998). Further, once the task or responsibility is outsourced, the client admits in a way that they cannot be as efficient as the supplier. Inherent to the award of the contract is the assumption that the supplier is more dependable, and scrutinizing this assumption is not easy.

**Quality**

Loss of partial or complete control of work quality and reduced quality (Downey, 1995; Akomode *et al.*, 1998; Embleton and Wright, 1998; Lonsdale and Cox, 2000) can result from the distance between the production and the customer. Further, reworking deliverables that have already been accepted may be difficult and costly, as they are likely to be considered a separate project. Increased requirements for quality control by the client could easily reduce the cost performance of the arrangement, where the transactions would become more complex and time-consuming.

Quality acceptance itself can be based on varying standard. The company must guard against the bias shown when own work is more easily accepted as of sufficiently high quality, and one where "hard cash" is paid out to an external supplier. It is often easier to be critical of the work of others than of our own.

**Flexibility**

Not mentioned in the literature is the flexibility of an organization associated with the larger work pool. If the tasks are not too asset-specific, slack work force can be moved from project to project, maximizing capacity utilization. Further, transferable skills can be leveraged from group to group. For example, having outsourced any activity that employed staff competent in IT, the staff is no longer available to help colleagues, even though this was never their role. Just as the supplier benefits from the economies of scope, so can the client.

**Strategy**

There are multiple strategic risks, and they may be hidden from view at the time the decision is made. If the internal cost and speed is known, the vendor cost and speed can be pinned down through a contract; however, can it also be assumed that avoidance of post-contractual dependency can be guaranteed through a contract or trust between the two parties?

**Reversibility**

Having outsourced a responsibility and adjusted the internal resources accordingly, there may be loss of strategic flexibility and reversibility (Embleton and Wright, 1998). The cost implications of a decision to revert to in-house operations may be just too expensive, making it impractical.

In any outsourcing agreement the customer yields some control to the supplier, which can be seen as a loss of control and potentially a loss of core activities (Embleton and Wright, 1998).

Lonsdale and Cox (2000) particularly stress the time of contract renewal, where the balance of power has changed. The customer has fewer practical options, and the decision to cancel the outsourcing may no longer be practical. This lack of reversibility can be disguised as success of the outsourcing. Was the contract renewed because it was successful, or simply because reverting the operation to the organization was too difficult?

**Hollowing and Dependency**

Over-dependence on outside firms for critical functions (Downey, 1995; Lonsdale and Cox, 2000) is risky because of the reduced control, and the line between critical and non-critical functions is not always easy to draw.

Staff degradation (Embleton and Wright, 1998) is an important issue, because the best employees may leave if they perceive no growth path in the company, and for those who stay, outsourcing is often seen as discouragement of training and development (Downey, 1995). The hollowing itself then increases dependency, as it is difficult to recreate the internal pool needed to bring the outsourced activity back in the company.

Lonsdale (1999) notes that between the risks of outsourcing of critical activities, and *ex-ante* and *ex-post* dependency on suppliers, it is the dependency that is usually underestimated. He argues that supplier dependency is often the result of a supplier being selected too early. During the first contract, the firm chooses from a wide variety of options, and high competition assures a good deal. During the contract period, the supplier learns a lot about the customer's service or product. Then, when the contract expires, because the client has made a large investment in the relationship, and because the supplier knows its competition better than the customer, the effective competition at the re-tender is reduced, as switching costs are too high, and other suppliers do not have enough knowledge to challenge the incumbent supplier.

Being in a superior bargaining position, the supplier may achieve better terms, and as a result the costs rise (sometimes to higher than the previous in-house costs), quality falls, and the supplier withholds innovation.

### **Competitive advantage**

One of the more subtle risks of outsourcing relates to reducing the competitive advantage, by developing skills in the vendors, which can subsequently be used to serve competitors (Quinn and Hilmer, 1994; Lonsdale and Cox, 2000). This is indeed a valid concern, but assumes that it will be the competition that will benefit. It could be argued instead that by outsourcing, our own company will benefit from skills the vendors have developed through projects for our competition, and that more generally, the more companies outsource, the better it is for everyone, because the vendors will leverage skills and processes across contracts, making the industry overall more competitive. Companies whose competitive advantage is the internal efficiency rather than a superior product or service would not likely favor such a prospect.

Loss of intellectual property rights (Lonsdale and Cox, 2000), and confidentiality leaks (Downey, 1995; Lonsdale and Cox, 2000) are an important risk, particularly if the supplier provides services to competitors, and also because of the movements in the workforce.

Loss of internal coherence (Lonsdale and Cox, 2000) resulting from outsourcing may mean that the gap left by the outsourced activity is felt by other internal groups, and some more general adjustment of activities and even culture may be necessary. Blumberg (1998) stresses that outsourcing requires a change in management mind set, which is one of the biggest challenges.

### **Quality of supplier choice**

Lonsdale (1999) notes that at the time of the contract, there is necessarily much speculation on future applicable conditions. However, manager's rationality is bounded (Cyert and March, 1963). As such, managers will not engage in exhaustive search for relevant information, they will not interpret data without bias, and they will not consider all options, but will foreclose on the first "good offer" (will satisfice rather than optimize). This means that while the decision to outsource is valid, it is the choice of supplier itself that may increase dependency.

### **Image**

Outsourcing introduces the risk of alienating customers (Blumberg, 1998). This is an important concern where knowledge of the customers is important, because the external supplier may not always convey customer feedback to the outsourcing company. Saying that it is a customer-oriented company but then refusing to talk to the customers is not going to increase customer loyalty.

### **Human resources and Politics**

In addition to the redundancies often associated with the outsourcing decision, the company needs to consider the impact on employee morale of those who stay behind (Embleton and Wright, 1998; Lonsdale and Cox, 2000). Further, reduced morale and potentially reduced career opportunities for the staff may make it more difficult to obtain employee loyalty and dedication in the organization (Downey, 1995).

On the supplier side, employees may not be screened as well (Downey, 1995), and may not be as committed (Akomode *et al.*, 1998), since "pride of own work" is not likely to be the same.

The outsourcing arrangement necessitates a skill shift, because it requires a new and more complicated level of communication (Blumberg, 1998). The shift can reveal poor internal alignment (Lonsdale, 1999), and a cross-functional team, or at least someone with cross-functional skills and knowledge are better able to cope.

### **Should we outsource?**

In addition to the cost aspect, Welch and Ranganath Nayak (1992) and Rothery and Robertson (1995) argue that strategic and technological issues should also be considered. Clearly, cost is just one factor. With a long list of potential advantages, disadvantages and risks, it cannot be expected that all will be applicable to each outsourcing decision if only because, in many occasions, there is a tradeoff involved. The speed may increase at the expense of cost. Or cost performance may increase, at the expense of morale.

Various authors have attempted to help guide the decision based on the characteristics of the company, the type of product or service, or the customer perspective. The results are surprising different lists of factors to be considered. For example, Blumberg (1998) proposes the following outsourcing decision criteria, to be taken into account in a make/buy strategic decision:

Criteria	Strategic decision	
	Outsource/buy	In-house/make
<b>Customer view of function</b>	Customers are concerned with the outcome – functions not visible	Customers are concerned with the process of functions performed
<b>Capabilities and physical assets to perform function</b>	Capabilities and assets are available in the mass market from qualified providers	Requires specialized capabilities and assets, not easily found outside company
<b>Technological requirements</b>	Technology is either very stable with limited applications or very dynamic, changing quicker than rate of adaptation	Relatively fluid technology and possession of technology can be a clear advantage
<b>World-class ability</b>	Average performance is sufficient; resources to achieve world-class are not available	Resource and capabilities exist to remain/achieve world-class performance
<b>Performed capability vs. alternative resources</b>	External vendors are clearly more competent	Leadership position exists
<b>Time and cost required to close performance gaps</b>	Significant capital and resources are required to improve gap	Internal source is clearly competitive cost advantage over external suppliers, rate of improvement is high
<b>Length of commitment</b>	Plan to harvest or exit business in near future	Long-term planning horizon exists

The *customer visibility* issue is first, and it sounds reasonable to focus on the customer. A product or service that is made more efficient by being outsourced at the expense of demand will not help the competitive advantage. There is also the issue of image; outsourcing the customer complaint department sends the message “we don’t want to hear about your problems”.

Taking account of the *capabilities and assets* is reasonable because a competent, competitive market is likely to be effective as well as efficient. However, the activity may be of strategic importance to the company, and therefore not a good candidate for outsourcing.

*Technological requirements* are a valid factor to take into account, because it is outside of the control of the company. It is not possible to change the rate of change of the industry, in order to facilitate the outsourcing decision.

*World-class ability* is not always relevant to the decision. In fact, it can be one way where innovation can be hindered. If the initial assumption is that the performance is average and not much can be done about it, there is no incentive to improve the internal processes, and maximize the benefits of an in-house operation, enriching the organization in the process. Naturally, outsourcing can be the solution if such world-class ability cannot be developed by the organization quickly enough.

*Alternative resources* need to be considered in any event, as this is fundamental to the decision. It is not very different from *world-class ability* in that it compares internal resources with the market.

*Time and cost to close gaps* is often key. An organization can improve its performance through innovation and investment in processes and tools. Time can easily be the limiting factor when time to market is critical, for example in the high-tech industry. The long-term vs. short-term horizon comes into play here, and drive the decision. Interestingly, the decision may be different for the short term and for the long term. A company can outsource an operation as an intermediate step to bringing the operation in-house, if this is what the company strategy dictates.

*Length of commitment* can be seen from two perspectives. Clearly, investing in technology and process improvements may be misplaced when the planning horizon is short-term. However, avoiding outsourcing when there is a long-term horizon implies outsourcing is the option to be avoided, assuming the organization will have some benefit by not outsourcing in the long term.

Overall this model takes into account the customer perspective as first priority, but is not focused on the long-term perspective, and in that context the decision is *operational* rather than *strategic*. The focus is on “can we do it better internally”, and the assumption is that we want to avoid outsourcing. Focusing resources on core business is completely ignored.

Based on empirical, Willcocks and Fitzgerald (1994) argue that the following factors are taken into account in practice:

	<b>Tend to Outsource</b>	<b>Tend not to Outsource</b>
<b>Business Factors</b>		
Are future business needs	Certain	Uncertain
Is the potential contribution of the service/activity to business positioning a	Commodity	Differentiator
Is the impact of this service/activity on the business strategy	Useful	Vital
Is the in-house cost for this service/activity compared to the market-place	High	Low
<b>Technical Factors</b>		
Is the service/activity	Discrete	Integrated
Is the technological maturity	High	Low
Is the in-house capability compared to the market-place	Low	High

The advantage of this model is that it takes into account that the competitive advantage is central to the decision. The assumption is that we want to outsource if possible. It comes into conflict with Blumberg’s (1998) model in that visibility of the long-term horizon favors outsourcing, while in Blumberg’s model it favors keeping it in-house.

The customer perspective is not mentioned directly, but is implied that when customer contact is a differentiator, then outsourcing is to be avoided. The technical factors account for much of the practical issues of outsourcing, particularly the level of integration of the activity. This is important, because it surfaces the issues of transaction costs.

Both models ignore many of the risks, such as dependency, hollowing, and the effect on human resources. In essence, the effect on the organization is ignored, and the outsourcing decision is examined in isolation. As such, both models focus on operations rather than strategy.

Blumberg (1998) also proposes a decision model for reducing service costs by outsourcing:

<b>Results of internal productivity and benchmarking survey</b>	<b>Service Critical</b>		<b>Service not critical</b>	
	<b>Strong positive perception</b>	<b>Weak negative perception</b>	<b>Strong positive perception</b>	<b>Weak negative perception</b>
More productive and efficient than industry	Expand service aggressively to customer base	Partnering with more efficient vendor	To be determined based on results	Outsource service through joint venture or partnership
Same as industry standards	Expand service	To be determined based on results	To be determined based on results	Outsource
Below industry standards	Expand service, but subcontract certain functions	Outsource to efficient service vendor	Subcontract certain service functions	Outsource aggressively

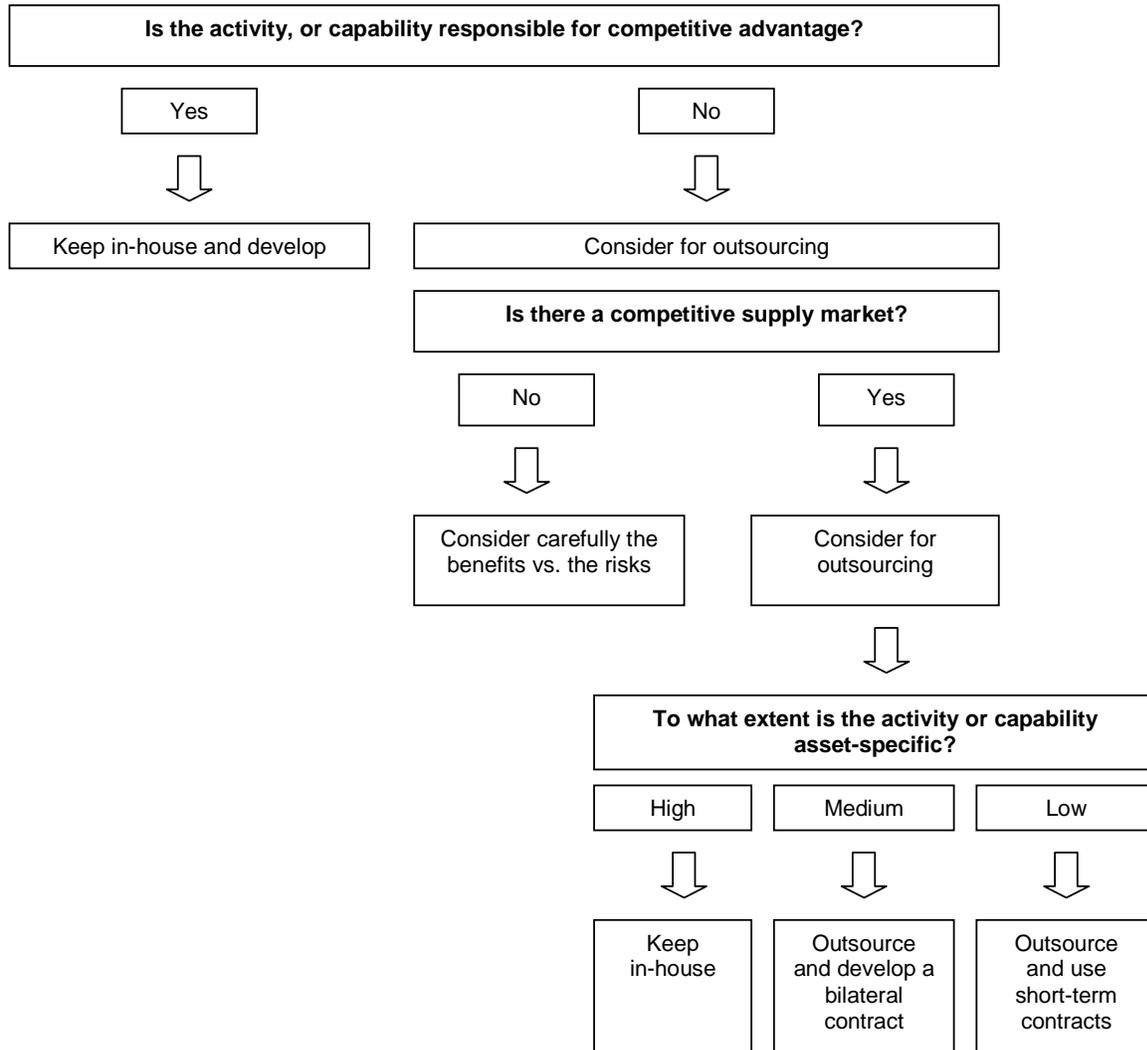
This model goes one step further in the customer visibility, to take into account the customer perception of the service. It does not attempt to be a complete model for the outsourcing decision, but raises the issue that current performance is a factor in the decision. In fact, outsourcing is often the solution to failing performance, and customer perception of the service is vital to the decision.

One interesting aspect of the model is that it favors outsourcing based on the customer perception, even when the service is critical. This is important because there is often the assumption that only secondary activities are good candidates for outsourcing. However, progressively more “core” activities are outsourced, as companies constantly redefine their core business and the boundaries of the organization. Furthermore, when a service is critical, it may make even more sense to outsource, when the benefits are seen to outweigh the risks.

Lonsdale (1999) takes the risk perspective, proposing the following risk management model for outsourcing, which meets three main requirements:

- Must retain resources responsible for the present and especially the future competitive advantage
- Must avoid monopolistic or oligopolistic supply markets
- Must manage the risk of post-contractual dependency

Clearly it is important to take into account the risks of a decision. Lonsdale recognizes that the decision cannot come from a list of criteria, but it must be addressed in a step-wise fashion.



The difficulty in applying this model is in deciding what is responsible for the competitive advantage. In a software development company, can we assume that the software development itself is what is mostly responsible? Then how does this correlate with the growth of the Indian software industry, essentially fed by software development outsourcing contracts? It is perhaps then marketing and more specifically branding? This sounds reasonable, but what about IBM losing out by outsourcing the operating system and the microchip?

The issue of competitive supply market is valid, and takes into account costs and competencies. However it is unclear how market competitiveness is assessed. Low margins? Many suppliers? The fundamental question is “can external suppliers perform better in terms of cost, quality, etc” and the answer can be “yes” even with high supplier margins, and few suppliers. What step two seeks to address is the risk of post-contractual dependency. If the market is not competitive, the dependency will be higher. This is a valid concern, but the dependency will be there in any case, because of hollowing of the organization, and the

increased knowledge the supplier will develop, putting it in an advantageous position versus the competition during re-negotiation. Further, the assumption that suppliers will tend to leverage any relationship they can is not supported by empirical evidence, which shows that the first contract tends to be more expensive than the renewals (Domberger *et al.*, 2000).

Asset specificity can make outsourcing ineffective, because of the increase of transaction complexities due to the dependence on asset-specific activities. This is valid, but ignores the opportunities of re-engineering that could make an activity less asset-specific. For example in-depth knowledge could be captured into a knowledge base. While the asset-specificity may still be relatively high because of the dependency on the knowledge base, it is easier to share the knowledge base with a supplier, than it is to share the expert. More simply, a complex process may be automated, reducing the complexity. The re-engineering may be very asset-specific, but once implemented, the asset-specificity can be greatly reduced. Therefore, as long as the time horizon is taken into account, asset-specificity is valid.

Fill and Visser (2000) propose a Composite Outsourcing Decision Framework (CODF), which attempts to help make a robust decision, taking into account operational, as well as strategic factors. It consists of three elements:

- CODF element 1 – contextual factors (Beulen *et al.* 1994) rated on a Likert scale, 1 - undesirable - 5 - desirable
  - Quantifiable criteria: costs, investments, revenues
  - Non-quantifiable criteria: strategic interest, confidentiality, stability of employment, dependence on suppliers
- CODF element 2 – strategy and structure
  - Nine guidelines (Ewartz, 1991)
    - How unique are the production processes?
    - How severe are the market cycles? And how frequent?
    - How much capital does internal manufacturing require?
    - How does geographic dispersion of customers influence sourcing decisions?
    - Does the market expect the firm to be the manufacturer?
    - How long will the process be viable?
    - Are there suppliers capable of doing the work, in terms of both technology and capacity?
    - Are there idiosyncrasies in the product, the process, or the market that force a sourcing decision?
    - Can the corporate culture be changed?
- CODF element 3 – costs
  - Must consider production costs and coordination or transaction costs. (Williamson, 1979)
  - Outsourcing increases coordination costs because the supplier behavior must be monitored (Williamson, 1979).
  - Costs from setting up contracts, paying bills, resolving disputes (Lacity and Hirschheim, 1993a)
  - When a lot of customization is required, in-house production may be advantageous.
  - Some transaction types can be efficiently handled through markets, while others are more efficiently through hierarchies (Williamson, 1992). Two dimensions affecting decision:
    - Frequency (of transaction)
    - Asset specificity (the degree of customization of the transaction. A transaction is highly asset-specific if it cannot be readily used by other companies, because of site specificity, physical asset specificity, or human asset specificity (Lacity and Hirschheim, 1993b)
      - Site specificity: how portable the transactions are
      - Physical asset specificity: how specialized equipment are needed
      - Human asset specificity: how specialized knowledge is required
  - Asset specificity types (Williamson, 1979)
    - Non-specific: transactions require standard equipment and non-specialized knowledge
    - Idiosyncratic: require specialized equipment or knowledge
    - Mixed: combination of both

CODF element 1 starts with the basics. What is the benefit to outsourcing, specific to the organization, and what are the disadvantages and risks. Already this takes into account both the short and the long-term

perspective, and is an open list, subject to customization to the organization. Further, each factor involves assigning the level of desirability. This is very valid, because not all factors are equally important to all companies. In cutting edge technology confidentiality can be a bigger risk than cost, but in a mature industry, it will likely be the opposite.

CODF element 2 acts as a checklist, to ensure that all major criteria are properly taken into account in element 1, and also to reveal any mismatches between the decision and the strategy and structure of the organization.

CODF element 3 acts as a “sanity check”, attempting to reveal the real costs of the decision, and some of the risks.

The main advantage of this model is that it encourages the organization to devise its own list of criteria, and to assign weights according to the internal and external context. It then crosschecks the first list, essentially twice. It seems however that once element 2 and 3 are taken into account, the end result could be an improved list of criteria in element 1. For example, the cost issue of element 1 would likely encompass the capital requirement of element 2, and the transaction cost of element 3. And the dependence of suppliers of element 1 could take into account the evaluation of the supplier capability of element 2, and the asset specificity issue of element 3. Therefore the model as a whole is simply a collage of other models. Its key value, in addition to customizing the criteria is the concept of the “sanity check”, which can reveal gaps in the earlier thinking.

Udo (2000) used Saaty's Analytic Hierarchy Process (AHP) as a quantitative approach to the decision, in an attempt to take into account the potentially complex hierarchy of criteria involved. The AHP is a multi-objective decision making tool, and helps convert subjective assessments into criteria weights, which can then be used to help select the optimal alternative. The criteria themselves are structured as a tree. For each criterion, the sub-criteria are compared in pairs, and their relative importance is specified by the user. The scale of comparison is from 1 (the two criteria are of equal importance) to 9 (one of them is absolutely more important than the other). The number of comparisons needed are  $N(N-1)/2$ , because the second half of the table consists of the reciprocals of the first half. Because it offers pair wise comparison it is easy to use, and has been often been used by researchers to decision making in problems similar to outsourcing decisions (Expert Choice, 1998; Tarimcilar and Khaksari, 1991; Yau and Davis, 1993; Saaty, 1990).

The advantages of such a model are several:

1. It allows the organization to compile a list of criteria, taking into account operational and strategic issues, internal and external to the organization as necessary
2. The weights, or relative importance is specified by the organization, enabling the varying demands of different types of organizations to be met
3. The tree structure can help clarify the relationships, for example the cost component may include fixed or variable costs, one time or on-going costs, and direct or indirect costs
4. The availability of good outsourcing alternatives may be ignored from the list of criteria, simply because it doesn't affect the desirability or not of outsourcing. If the risk of outsourcing is unacceptably high, there is not much point in researching the market for competitive suppliers
5. It is a quantitative model, so the tradeoffs are more visible. The organization defines the tradeoff by assigning weights to each criterion, for example giving priority to fixed over variable costs, or to cost in a low-market product versus quality in a up-market product
6. The alternatives can be multiple. It does not have to be simply an outsource “yes/no” decision. Expanding the internal capacity may be an alternative to cope with increasing demand, as can process reengineering be used to reduce the costs
7. It is incremental. Criteria and alternatives can be added, and the model can be re-evaluated automatically
8. The alternatives may each have strengths, which can help reveal opportunities or risks. These can be used for the specific decision, or can be leveraged by the organization in other ways
9. It takes into account the effects of uncertainty, facilitating a better understanding of the risks

Expert Choice (2002) and InfoHarvest (2002) provide a software application for implementing AHP. One weakness of the AHP is the Rank Reversal Phenomenon, where when adding new alternatives, the rank of previously rated criteria may be reversed due to normalization. InfoHarvest's solution, Criterium® DecisionPlus®, provides also an implementation of Edward's (1977) Simple Multi-attribute Rating Technique (SMART), which is not susceptible to the Rank Reversal, because the scores are not based on pair wise

comparisons, but on direct weighing of the criteria. Contrary to AHP, the SMART model is strictly tree-based, so each sub-criterion can only be linked to one parent criterion. However Criterium® DecisionPlus® allows the same flexibility in using the SMART model as in the AHP, and can freely switch between the two, as long as the user is aware of the risk of Rank Reversal.

In addition to the criteria weights, Criterium® DecisionPlus® facilitates sensitivity analysis, uncertainty in the weightings, and tradeoff scatter grams, which can be used to evaluate a wider set of alternatives quickly, and test the robustness of the decision.

The risks in implementing either AHP or SMART are:

1. There is no guarantee that all important criteria will be included
2. The weights used may fail to take into account all parts of the organization, or may be simply incorrect
3. The evaluation of the alternatives is a guess; the performance of each alternative is not known, until it is tried in practice. Exception may be the "do nothing" alternative

### ***What functions, tasks, or responsibilities should we outsource?***

In the traditional mind-set core functions should not be outsourced. However as Brown (1997) points out, increasingly core functions are being outsourced. A distinction needs to be made between core activities and core competencies; this is not always self-evident. When they went into the PC market, IBM thought that their core competency was marketing, and not creating an operating system or microchips. Microsoft developed the operating system and Intel built the chips. These two firms are now more important to the PC industry than IBM (Lonsdale and Cox, 2000). It is easy to see why IBM would want to leverage the brand rather than the manufacturing capability.

Brown (1997) warns against outsourcing areas of business close to the customer, where visibility is the highest. However, in some operations it is easy to disguise the fact that the customer is not really in contact with the company directly. For example, the ever-growing call centers are typically staffed by dedicated teams, who respond to customer calls with the outsourcer name, not the name of the supplier. Combined with toll-free numbers that act to hide the location of the respondent, the customer unaware of being in contact with a third party. Further, the quality of service does not have to suffer either. Combined with Caller-ID, the incoming call can be directed to a specific person within the outsourcer team, bypassing the team switchboard. Armed with a CRM system which would be easier to justify within the supplier scope and scale, the respondent can actually provide more customized service than the outsourcer ever could.

Therefore the decision on what tasks and responsibilities to outsource needs to be driven by the context of the decision. Supplier expertise needs to be leveraged, alongside with minimizing the risks. This cannot be known in advance of reviewing the specific match between supplier and customer. Furthermore, HR may drive the decision, because of headcount restrictions, or availability of skills. Rather than being a yes/no question, deciding what to outsource depends on a dividing line, moved by the forces of interests, contexts and possibilities. The forces themselves change over time, and the level of outsourcing may gradually increase as suppliers become progressively better, or be reduced as the organization develops the capacity needed.

### ***How should we outsource?***

Cox and Lonsdale (1997) argue that only about 20% of organizations are outsourcing in a sophisticated manner, and that the rest simply following the latest fads, and without any sort of guiding methodology.

Complete methodologies are scarce in the literature, but some common themes emerge nonetheless. These are the methodology itself, and the emphasis placed on the type of outsourcing, the vendor selection, the contract, and the relationship management once the contract is in place.

### **Outsourcing methodology**

Embleton and Wright (1998) propose the following keys to successful outsourcing:

- Undertake strategic analysis
  - Determine outsourcing candidates
  - Calculate the cost of providing the service internally. Manion *et al.* (1993) note that measurement of costs should not be against current budget, or perhaps against the actual

- costs of running the department. It should be measured against the costs of running a “best-of-breed” operation.
    - Select the provider
  - Manage the relationship
    - Management structure
    - Monitor and evaluate
  - Consider the staff options and issues
    - Leave the firm
    - Join supplier
    - Stay with firm
    - Morale issues

This model over-emphasizing cost factors in the strategic analysis, but correctly emphasizes the management of the relationship as a significant, independent step. For the cost, the issue of what internal cost to compare is raised. This may be valid as a concept, but in including this, two separate problems are merged into one. The one issue is can we improve performance without outsourcing, and the other is should we outsource. If the objective is to improve performance, should we not be comparing current performance to current possibilities offered by the suppliers? If we compare the cost for a best-of-breed operation with the opportunities offered by suppliers, and we find that the suppliers are not operating at best of breed, does this mean that we should not outsource? Does it even mean that the organization could ever achieve best-of-breed performance? It seems that perhaps re-engineering should be investigated in parallel to the outsourcing decision, or that the outsourcing agreement itself should include re-engineering efforts.

Managing the relationship is key to the success of the outsourcing, and often does not get enough management focus, particularly when one manager signs the agreement, and another manager is left to manage it. The outsourcing decision needs to take the management into account, ensuring that the resources are there, or can become available to manage the relationship, before the decision to outsource is actually taken. Similarly, staff issues cannot be left for after the decision, or after outsourcing is actually implemented.

Zhu *et al.* (2001) propose the following methodology:

1. A business plan that takes into account the full costs of the service, including “blue money”, costs of transactions never actually cross-charged between departments.
2. The development stage
  - The contract
  - The business relationship
    - Establish measurable goals and objectives
    - Ensure that both parties benefit from the relationship
    - Maintain mutual respect and willingness to learn from each other
    - Involve senior management support
    - Use a joint, multi-level relationship management approach
    - Continually track and measure performance and provide feedback
  - The impact on employees
  - The outsourcing timeline
  - The communication plan
- The implementation stage, including the transition plan with at least the following components
  - Communications plan
  - Timeline
  - Scope of work being outsourced
  - Details of agreement
  - Impact on employees
  - Impact on subcontractors
  - Physical resource implications (floor-space requirements, building access, furniture etc)
  - Access to computer systems and information, and security requirements
  - Impact on non-outsourced work
  - Training
- The post-outsourcing review

Zhu’s model attempts to outline a process, steps to be taken sequentially. Essentially a change management plan, it raises issues that need to be taken into account, such as ensuring that both parties will benefit. It does not list all issues that need to be taken into account; instead it points to issues that may be

missed. For example, it does not cover supplier selection or the risks involved. However, it raises critical issues such as internal communication, impact on non-outsourced work, training, and the critical post-outsourcing review. It can therefore be used as a base to build upon.

### Types of outsourcing

Outsourcing can vary in degree, in number of suppliers used, and the way the suppliers are selected. Currie and Willcocks (1998a, b) propose the following types of outsourcing, noting that they are not mutually exclusive:

- Total outsourcing. The supplier takes over the complete operation, sometimes through BPO (Business Process Outsourcing), the combined outsourcing of an IT system and the business process it supports (IDC, 1998b)
- Multiple supplier outsourcing
  - Advantages
    - Allows client to negotiate outsourcing contracts with a range of potential suppliers differentiated by knowledge, experience and market position (Cross, 1995)
    - The client is more likely to mitigate the risk of outsourcing. Outsourcing more than 70-80% of IT activities and services to a single supplier pose the greatest risk (Lacity and Hirschheim, 1993)
  - Risks
    - Difficulty of managing and coordinating the work of several suppliers (Willcocks *et al.*, 1995)
    - Difficulty pinpointing accountability and responsibility, particularly if the business processes are interdependent (Loh and Venkatraman, 1992)
- Selective sourcing – outsourcing selected work to a discrete number of approved suppliers. Selective outsourcing tends to be lower risk and more successful (Lacity and Hirschheim, 1995).
- Joint venture/strategic alliance sourcing – involves entering a long-term partnership, and profit and risk sharing. Strategic alliances can be formed to acquire the desired strategic capabilities more rapidly (Nohria and Garcia-Pont, 1991). However, they cannot replace the internal development of organizational capabilities (Chan and Wong, 1994).
- Insourcing. Brown (1997) refers to this as co-sourcing: the client keeps responsibility for the management and strategic aspects of the outsourced activity, while the outside provider supplies consultancy and experienced personnel. Downey (1995) cites the following options:
  - Employee leasing – term based
  - Contracting – project based

Total outsourcing, particularly BPO, opens opportunities to accessing the advantage of outsourcing alongside re-engineering. The client company can potentially increase the benefits of the outsourcing agreement, much more than could be foreseen in the original decision. The risk that needs to be taken into account is that the supplier responsible for both the work as well as re-engineering may have a conflict of interest, as re-engineering may reduce the total revenue over time. Using a different supplier for re-engineering raises the issue of confidentiality and control, in a situation where the two suppliers are competitors; the supplier managing the re-engineering would have every interest to maximize the found inefficiencies in the processes of the competing supplier. Nevertheless, whether in a context of complete outsourcing or not, re-engineering needs to remain visible throughout the decision.

Multiple-supplier outsourcing enables leveraging supplier differences at the expense of managing complexity and the risk of responsibility gaps (Currie, 1998), particularly where the suppliers' work is complementary. When suppliers are awarded similar work, their performance can be continually benchmarked, as each supplier's performance is against their competition. At the risk of reducing the scale and scope effects sought by the outsourcing agreement, using multiple suppliers can act as assurance that the supplier performance will remain up to par, including quality, cost, and dependability. Furthermore, if performance problems arise with one supplier, some work can be shifted to other suppliers, giving time to the problem supplier to "clean up their act". On the other hand, it can help the organization keep a perspective on expectations; similar issues raised by the vendors may indicate the need to re-evaluate the assumptions made by the organization.

The multiple-supplier model has been tested in practice in our organization over the last four years, and was found to be very effective, and to yield the anticipated benefits. See case study.

**Multiple-supplier case study**

In our organization, traditionally a single vendor was handling all FIGS (French, Italian, German, Spanish) projects. The management task was relatively simple, because the communication overhead was low. A single vendor was trained, and the training and support was leveraged across multiple languages and multiple projects.

However, because of lack of competition, there was no motivation for the vendor to improve the internal productivity, as the project costs are always on a per-unit basis. Particularly important cost was the engineering and testing hours, typically accounting for 30% of a project cost. Indeed, automating part of the process could benefit the vendor mid and long term, in that the resources would then be more productive and could then take over additional work. However, because the short-term targets were met, and because within the engineering pool it is the best engineers that would be needed for the automation, allocating this most scarce of resources was never in practice implemented. The experts were pulled into a project to resolve complex technical problems, but then quickly moved to other projects, with lower cost engineering resources handling the routine tasks.

Seeing this complacency, our company switched to a two main vendor model, where two of the core languages (FIGS) are handled by one vendor, while the other two by another. Despite the increased overhead of having two key vendors (in addition to the many smaller vendors), the new system exposed great process inefficiencies, for example when one vendor would quote 2 weeks engineering, another would quote 1. Assuming the two vendors were planning the same tasks, one vendor would have to be twice as productive as the other, in which case the difference was further investigated so that the better productivity can be leveraged. Alternately, where the vendors were not in fact scheduling the same tasks, this was an opportunity for standardization so that the end product quality would be uniform alongside the variable costs.

Using multiple vendors has introduced a spirit of healthy competition, where each vendor wants to produce better leverage statistics, and shorter turnaround times. Leveraging the skills of the better vendor was something that was considered problematic, but vendors did not refuse to collaborate, particularly since this was often a simple issue such as what configuration to use for a given task.

Because the work of the different vendors has no interdependency, there is no risk that accountability will be unclear. Each vendor is solely and completely responsible for the languages they handle. Because this model spans projects, there is reduced risk that one vendor will receive sentence memories made by another vendor, and which are deemed to be of lesser quality.

Selective outsourcing implies long-term relationships, which are critical where there is a learning curve, and any kind of investment for either the organization or the external supplier. It gives the possibility to balance the load, and manage capacity by awarding new work to the supplier who seems better resourced at the specific time.

Joint ventures are particularly interesting in combining technology because a single organization may be unable to invest in innovation in multiple industries. In the software industry buying stakes in companies with complementary skills or product portfolio is the more standard approach. This reduces the risk of leaks in confidentiality and loss of competitive advantage.

Currie (1998) notes that in any outsourcing agreement, it is important to develop strengths in the areas of contract management and negotiation and competitive benchmarking and performance management.

Insourcing may help meet capacity fluctuations without the risks of hollowing and dependency, and is an interesting prospect, because it can be effective even where there is high task integration and asset-specificity. The supplier contact can better represent the client organization to the supplier, by virtue of proximity and better knowledge of the client processes and contacts. Technical expertise can help improve the client organization, by improving the internal processes. The risk of in-sourcing is that it may start as short-term, and become a long-term situation. The disadvantages are two. First, the in-sourced resources gradually merge in culture and skills with the host organization, nullifying the advantage of their uniqueness. Second, the cost may easily be much more to the option of hiring a person with similar skills, an option that

could ensure higher loyalty and commitment, as well as improve the flexibility of the work pool, by virtue of the increased size.

### Vendor selection

Blumberg (1998) proposes the following steps in selecting vendors

1. Determine needed skills, activities, and physical assets
2. Determine goals and objectives for outsourcing (e.g. to minimize overhead and technology costs)

He lists the following qualifying factors for vendors

- Breadth and depth of experience
- Financial solvency
- Commitment to quality improvement and customer satisfaction
- Unique service capabilities
- Understanding of the customer's business and market
- Commitment to technological innovation
- Willingness to offer performance guarantees
- Long-term service commitment
- Availability of customer references
- Reputation
- Skill and experience of service personnel
- Full range of service portfolio

This model is valid because it best matches the organizational goals with the available alternatives. It helps crystallize the objectives, and expose any tradeoffs that must then be made consciously.

Domberger *et al.* (2000) propose two routes to the vendor selection, competitive tendering and contracting (CTC) and direct negotiation. CTC is suited particularly when cost reduction is the objective, while direct negotiation focuses on the match between the two companies, and the quality and contract performance. Empirical research showed that 52% of the outsourcing contracts were awarded through direct negotiation, and 38% through competitive tendering. Interestingly, Domberger *et al.* (2000) found that there is no significant difference in the contract prices between the two methods. They did find that first time contracts were more expensive than repeat contracts, and that clients tended to renew their contracts with the same vendor five times more frequently than awarding the contract to a new vendor.

Taking into account both authors, it seems reasonable to investigate direct negotiation with vendors who appear to have the qualifying characteristics noted by Blumberg (1998), after following steps 1 and 2.

Domberger's findings regarding the cost reduction during contract renewal is untypical of the theoretical literature, where cost escalation is the key fear. Considering that outsourcing success of alliances depends on good personal relationships (Faulkner, 1995; Yoshino and Raugan, 1995, Lawrence *et al.*, 1998), it is not surprising to expect that while the risk of escalation is there, organizations manage reduce this risk through personal relationships or simply experience.

### Contract

The more the outsourcing relationship will depend on the contract, the more care needs to be taken in drafting it. When the outsourcing company is inexperienced, they may feel they are in danger of signing a blank check, often finding it too difficult to make requirements explicit and in sufficient detail (Sweet, 1994). McFarlan and Nolan (1995) note that long-term agreements are difficult, because suppliers make initially an investment, in anticipation of back-loaded profit flow. Then, at the time that the suppliers start making a profit, the customer may find the monthly charges excessive and may want to upgrade the service or technology. Clearly, for an alliance to be successful and endure, both firms must feel they are benefiting, and the economics of the arrangement must outlast the careers of the participants who put the deal together (McFarlan and Nolan, 1995). This is particularly important in the software industry because it has high turnaround.

Blumberg (1998) argues that good contract have the following characteristics:

- Protect customers against price increases, negligence, breaches of security, and issues of liability
- Enable customer to modify or terminate contract under specifically defined circumstances
- Offer reasonable assurances that a requisite level of quality is maintained, including quality guarantees, and penalties or rebates for non-performance
- Share earnings from improvements in technology with customers

- Commitment to proactive acquisition of new hardware technology and software upgrades as they become available

In cases where advanced technology is used, prices may indeed be reduced over time, as the technology itself becomes cheaper. The issue of security is critical, even when the outsourced function is not. Simple information such as the release schedule of an important software release needs to be protected from competition.

Other authors support Blumberg's concern about exit conditions. For example Lonsdale (1999) and Currie (1998) argue in favor of short-term contracts. This offers the possibility to test out the outsourcing arrangement, and to fine-tune the contract and the expectations on both sides, reaching the point of renegotiation all the wiser.

While Blumberg (1998) proposes that a good contract will encourage the supplier to share the benefits from productivity improvement, Currie (1998) found, through empirical studies, that the one area where multiple suppliers benefited from a multiple-supplier arrangement was that their main objective was to meet the conditions of the service level agreement, without necessarily offering additional value-added service.

In practice it depends on the scope of services offered by the suppliers, as well as their marketing strategy. If the suppliers offer re-engineering as a value-added service, sharing the benefits would be giving out a free service, and with typically higher margin than the core service. However, suppliers may be willing to share the benefits of productivity improvements, as a sign of goodwill, to increase trust in their motives and confidence in their capability, as a way to entice the client to see the benefit and subsequently award re-engineering projects, or as way of competing with other suppliers.

Regarding upgrading software and hardware, many companies avoid the risk of upgrading too soon, following the "never the first version" rule. Any software or hardware component is reviewed in context of the opportunities, in addition to the market reaction and problems found during take up, and is perhaps tested in isolation, outside of the production environment.

Currie (1998) studied two organizations that used multiple vendors to reduce risk. The lessons learned were:

- Contracts
  - Cooperation, coordination, knowledge sharing and managing the relationships cannot easily be put into a contract
  - The client must understand the market strategies of suppliers – cannot just set terms and conditions
  - Relatively short-term contracts help avoid vendor complacency (Cross, 1995)
  - It is important to define hardware and software requirements
  - Suppliers tend to pay lip service to contracts management issues
  - Suppliers trying to extract more money for extra work covered in the original outsourcing contract, raising a potential cause of conflict
  - Control of suppliers can be facilitated using a clear definition of services required from supplier, a carefully crafted contract, and knowledge of the market, in order to predict interest received by suppliers
  - The performance measurement system must be agreed upon with the supplier
- Internal implications
  - The experience of outsourcing should not be examined in isolation of the wider business imperatives (Lacity *et al.*, 1996)
  - Different style of management necessary
  - One of the fundamental elements of the outsourcing contract is relationship management with the supplier. Yet, skills shortages existed on both sides
  - Culture-gap between generalists (managers) and specialists (technologists) (Currie and Glover, 1998) i.e. specialists need business awareness to manage the contracts
  - Communicate realistic expectations to the rest of the business
  - To mitigate risk, need to thoroughly understand and evaluate any IT service activity before outsourcing it. Then both the potential cost and benefit it can be measured, and vendor performance can be evaluated
  - Problems arise from not anticipating changes to the IT service (Currie and Willcocks, 1998)
  - It is difficult to separate strategy from operations

The findings regarding the contracts illustrate the problem well. While the contract must be “carefully crafted” to avoid complacency, and protect the client from “lip service”, the first finding is that this is inherently difficult to do, because it depends on relationships and cultures.

### **Relationship Management**

Currie’s findings on the internal implications reiterate the need to refocus the management effort, which in turn requires a new skill set. The key skills are business skills and contract, vendor, and relationship management. Lonsdale (1999) argues that managers often outsource to eliminate the need for managing activity, and it is important to understand that the responsibility of managing the activity is replaced by the responsibility to manage the contract. He argues that the client must seek to improve the supplier performance continually, to reduce the scope for post-contractual opportunism and complacency (Lonsdale, 1999).

In contrast to seeing outsourcing as a detailed contract, many authors argue it is in fact a relationship, and that its success depends on good personal relationships (Faulkner, 1995; Yoshino and Raugan, 1995, Lawrence and ul-Haq, 1998). Research by Lawrence and ul-Haq (1998) showed the emphasis placed on relationships in partnerships, where key personnel arranged trips twice a year to progress negotiations, but ended up going on salmon fishing expeditions, taking their wives along. They emphasize the intangible benefits, such as team building and cultural exchanges which made the communication easier, and the cooperation more productive. As a condition to being able to develop relationships, they argue that it is necessary to have continuity of personnel, so that the relationships can be leveraged (Lawrence and ul-Haq, 1998).

Relationship management is one of the most fundamental issues in outsourcing, particularly where the communication matrix is enlarged, and the interdependencies more complex. There is often less control of the interface between supplier and customer, because the communication happens at multiple levels, involving different cultures and personalities, each with conflicting priorities. Irrespective of how accurately the cost benefit has been calculated, the outsourcing project may fail during implementation, because of lack of skills, or failure to recognizing the importance of applying them.

### **Summary – derived frameworks**

There are three main questions that need to be answered:

1. Should we outsource?
2. What functions, tasks, or responsibilities should we outsource?
3. How should we outsource?

### **Should we outsource?**

None of the models presented above offers a complete method of answering this question. Nonetheless, each provides some useful insight to the question. The structure of CODF (Fill and Visser, 2000) is useful in that it recognizes that the decision consists of a series of steps. However, it fails to feedback the results of elements 2 and 3, to element 1. A quantitative method such as SMART (Edwards, 1977) or AHP (Saaty, 1990) can provide a more robust framework to aid the decision.

The proposed “Double-loop SMART framework” is:

1. Define the goal
  - a. The goal
    - What is the problem the outsourcing decision is trying to solve?
    - Tradeoffs or context are not included during the definition
2. Create the model
  - a. Criteria
    - Construct a SMART model to take into account the potential benefits of the outsourcing decision, the potential disadvantages and risks
    - The criteria can be quantifiable or non-quantifiable
    - Interdependencies between the criteria can be captured by use of a tree structure
    - Include in the model the stakeholder interests which may be affected, such as customers, human resources and the organization itself

- b. Weights
  - Assign a weight to each criterion, taking into account the key goal, and the context of the organization
- c. Alternatives
  - Generate alternative solutions that may address the problem
  - Describe the alternatives fully, including the functions or responsibilities proposed for outsourcing, duration of the agreement, and other terms or assumptions
3. Validate the model
  - a. Theories
    - Validate the model for completeness, by ensuring that the findings of the various authors are included, or consciously excluded if not applicable
  - b. Stakeholders
    - Validate the model against the stakeholders, for example ensuring that the weights are appropriate
  - c. Alternatives
    - Validate the alternatives by involving the parties affected, to ensure that the alternative itself is valid. For example, are suppliers interested in the business, and would they commit to the proposed list of tasks and responsibilities?
4. Generate recommendation
  - a. Evaluate alternatives
    - Evaluate the performance of each alternative versus the potential advantages, disadvantages, risks, and effects on stakeholders.
  - b. Analyze alternatives
    - Perform sensitivity analysis to test robustness of recommendation
    - Expose uncertainties and risks
5. Evaluate the model in view of the recommendation
  - a. Validate recommendation
    - Share the recommended alternative with the stakeholders and outside suppliers, in search of unforeseen conflicts and concerns
    - Verify that it is actually feasible. Are the resources available to implement it, such as funding, top management support, the required skill set, and the time necessary?
    - Do suppliers agree they can actually provide better service than in-house resources?
    - Are the tradeoffs and risks acceptable?
  - b. Adjust model
    - If step 5a reveals a problem, adjust the model to take into account the criteria which made the recommended alternative fail or appear too risky

Using a quantitative model such as SMART or AHP allows for all relevant criteria to be considered, or be deliberately ignored, without the need to adhering to a single model. SMART is chosen over AHP, to avoid the risk of rank reversal, as the model is fine-tuned by the addition of alternatives. The quantitative aspect enables the evaluation of how much better the selected option is from the alternatives, testing of the robustness of the decision, making the assumptions explicit, and exposing risks and issues which need to be taken into account during the implementation of the decision.

### **What functions, tasks, or responsibilities should we outsource?**

The list of functions or responsibilities cannot be examined in isolation from the outsourcing decision. While a SMART model may be used to decide on each task, a less cumbersome method is simply to propose the exact tasks and responsibilities to outsource in step 2 above, and reveal any conflicts during the model validation.

If it proves that some tasks or responsibilities need to be excluded, the alternative descriptions can reflect this change. It is important to include the affected parties. The description of the alternatives can act to quantify the work, calculate the rates, and act as a framework for the contract itself.

## How should we outsource?

If outsourcing is chosen as the best option, the methodology of implementation will be similar to Zhu's model (2001) and will have three components, but will integrate the issues of vendor selection, and relationship development and management:

1. The plan
  - a. Choose outsourcing type (Currie, 1998; Brown, 1997; Downey, 1995; Willcocks *et al.*, 1995; Loh and Venkatraman, 1992)
  - b. Choose supplier(s) (Blumberg, 1998; Domberger *et al.*, 2000)
  - c. Choose BPR supplier, if this project is approved, irrespective of outsourcing model
  - d. Agree measurable goals with the stakeholders (Zhu *et al.*, 2001)
  - e. Agree on timeline with the stakeholders (Zhu *et al.*, 2001)
  - f. Agree on term of contract with the supplier(s) (Cross, 1995; Lonsdale, 1999; Currie, 1998; Zhu *et al.*, 2001)
  - g. Communicate plan to stakeholders (Zhu *et al.*, 2001)
2. The implementation
  - a. Bring stakeholders together periodically so they can meet and interact face to face, establishing a relationship for future work (Faulkner, 1995; Yoshino and Raigan, 1995, Lawrence *et al.*, 1998; Lawrence and ul-Haq, 1998)
  - b. Measure performance periodically and discuss with stakeholders as necessary (Zhu *et al.*, 2001)
  - c. Manage a nominal number of projects in-house, in parallel to the outsourcing, as a way of benchmarking the performance, and as assurance that the skills will be maintained while the full outsourcing scenario is being tested
  - d. Manage the relationships (Lonsdale, 1999; Embleton and Wright, 1998)
  - e. Communicate progress to stakeholders (Zhu *et al.*, 2001)
3. The post-implementation review
  - a. Communicate results to stakeholders (Zhu *et al.*, 2001)
  - b. Feedback results to the model, enabling double-loop learning

## Methodology

In order to implement the “Double-loop SMART framework”, the needed data are:

- Definition of the goal
- Criteria for the decision
- Weights of the criteria
- Alternatives

Once created, the criteria and the alternatives need to be validated against the theories, and the stakeholders. Validation against the theories will be done by comparing the key points raised in the literature review, against the model as a whole, and the criteria used in the model.

The validation against the stakeholders has three parts:

- Validation against the current group. This is done below, as part of the process of creating the set of criteria
- Validation against other internal groups. This will be done during the validation of the alternatives
- Validation against suppliers. This will be done during the validation of the alternatives

## The goal

The goal is to choose a sourcing alternative that can best solve the low turnaround problem.

## Creation of the model

### Criteria for the decision

The selection of criteria is based on the categories of potential advantages and disadvantages or risks to the outsourcing decision. This way, the outsourcing alternatives can be evaluated against both positive contributions as well as risks.

1. The criteria
  - a. The operations objectives were used as a base, because this is a service operation, and speed is the key variable to include. Furthermore, this matches the operations theme found in the literature
  - b. To ensure compatibility with the corporate strategy, a strategy criterion was added, its correspondence with the second theme in the literature
  - c. The image theme has two components
    - i. The customers are the key stakeholders, and their view of the decision is important. They are further reviewed below
    - ii. The financial image of the decision, for example the profit per head, is not addressed separately from the cost objective. The reason is that the cost of localization is dependent on the regional budget, and the combination of the cost and revenue of localization drive, in part, the profitability of the regional offices, the main direct customer of the service. Similarly, the effect on headcount, the transaction overheads, and the supplier profit are taken into account in the cost objective. Cost escalation as a result of renegotiation is taken into account in the dependency sub-criterion of strategy
  - d. To capture the impact on the staff, an HR criterion was added, completing the range of advantages and disadvantages and risks of the literature
2. To derive the list of stakeholder interests, the stakeholders need to be identified
  - a. Customers
    - i. The direct customers of localization are the regional sales groups. The end-users are indirect customers, and it is assumed that since the success of the regional sales groups depends on the satisfaction of the end-users, catering to the needs of the sales groups will accommodate the needs of the indirect customers, indirectly
    - ii. Customers want the projects to be completed quickly, and cheaply, so they can have more of them. In pursuing these interests, the quality must not be sacrificed

- b. Suppliers
  - i. The suppliers are stakeholders to the decision, but they do not need to be taken into account at the criteria stage. The compatibility or not of their interests with ours, will be reviewed in the validation stage
- c. Staff
  - i. The current staff stands to be directly affected by any decision, in terms of role within the company, career growth prospects, skills development, and motivation. While the outsourcing decision does not set to improve these areas, the potential impact needs to be taken into account, particularly if it is negative
  - ii. The staff interests therefore include protecting existing career growth prospects, to continue to develop their skills, and to continue to be motivated
- d. The HQ groups and the regional groups
  - i. A change in sourcing may affect the support requirements, and therefore the internal resources needed to support any change. Indeed, even if we were able to double our capacity with process improvements, would the other internal groups be able to cope, taking into account their own headcount restrictions?
  - ii. The regional groups, being responsible for the linguistic reviews, may be affected by a sourcing change, if for example the time or work required of them increases. With a reasonably long turnaround already, doubling their workload could mean an impossible task
- e. The organization
  - i. The organization as a whole has a stake on the decision, because of the possible change between fixed and variable costs, risks of dependency and lack of reversibility, and risk of hollowing
  - ii. It wants the customer needs to be satisfied, while maintaining low overall costs, while minimizing the risks of dependency. It wants to maintain strategic flexibility by avoiding hollowing, and to avoid the risks of confidentiality leaks and loss of competitive advantage

The list of criteria follows.

### ***Speed***

Speed improvement describes the essence of the problem we are trying to solve. Projects need to be completed more quickly than they are now, to address the need of the customers.

The speed objective encompasses issues of time to market, productivity, and process innovation. Speed is dependent on the process capacity and efficiency, but also on the overheads of the internal and external transactions. Because one is primarily dependent on the suppliers, while the other depends primarily on the internal resources, two sub-criteria are used to add granularity to the speed component. They are (a) Project throughput and (b) Transaction throughput.

### ***Quality***

The internal quality standard must be maintained or improved, in order to maintain or increase customer satisfaction, and reduce the risk of rework as a result of faults, which would slow down the operation.

Process reengineering can help design faults out of the products, and quality performance can be measured at varying degrees depending on the solution chosen.

### ***Dependability***

The proposed solution must be dependable, ensuring that the remaining objectives are consistently met. This way the internal customers can convey accurate information to the end customers, and the improvement will be an expected phenomenon instead of sporadic successes.

### ***Cost***

Both the internal and external costs need to be taken into account. If cost is transferred from one group to another, it must be a conscious decision, and acknowledged by the affected groups. The total cost may be higher than the current cost in favor of increased productivity, but this must be known in advance. Regional organizations are sensitive to cost, even though it is the current internal bottlenecks which limit throughput.

The cost criterion encompasses issues of fixed/variable costs, economies of scale and scope, capital investment and keeping up with technology. The difference between internal and external costs must be taken into account, because while the sum may remain stable producing the same ROI, it is the regional budget that drives the project selection and this is based on external costs alone.

Because the company is very conscious of headcount and fixed costs, the decision was taken to further break down the cost into (a) Fixed cost, and (b) Variable cost.

### ***Flexibility***

The chosen solution needs to allow for capacity fluctuations, and adjustment of priorities. This refers to operational flexibility. Strategic flexibility is discussed separately.

Flexibility can be further broken down to (a) Capacity fluctuation, and (b) Priority changes. Capacity fluctuation helps accommodate demand fluctuations because of fluctuations in our own company, as well as other companies who use the same vendors. Priority changes accommodate the need to meet deadlines for the more urgent projects, sacrificing turnaround for less urgent ones.

### ***Human resource issues***

The five operations objectives do not take into account personnel issues. An outsourcing decision may or may not introduce redundancies, but the roles will likely need to be redefined. The staff may be unable to cope with the new roles because of misalignment of skills or interests, and the career paths can be affected dramatically. Furthermore, potential morale issues need to be considered.

### ***Strategic issues***

Many of the future-related issues can be accounted for in strategy, for example the risk of hollowing (skills degradation), reversibility of the decision once taken, reduction of over-dependence on external companies and internal groups, contribution of the service to the competitive advantage, and the impact of any decision on the business strategy.

Care must be taken so that cause and effect are not taken into account separately. For example, the risk of hollowing is what would increase dependency on external companies, while contractual obligations would be separately reflected in the reversibility. Therefore, two sub-criteria are chosen (a) Hollowing and dependency, and (b) Reversibility.

## **Summary**

The objectives listed above seem to take into account all key stakeholder interests, including the customers, the group, and the organization. Because the customer requirements are taken into account by the operations objectives, they do not need to be assigned a separate objective in the implementation of Double-loop SMART framework.

One risk that is consciously being avoided is the risk of mixing the evaluation itself with what is needed for the implementation. For example, the required skills in relationship management may not be readily available in the group for a full outsourcing scenario, but training can fill such a gap.

## **Weights of the criteria**

The top-level criteria were selected based on the literature alone, without consultation with other parties. However, completeness of the list was evaluated later, during both the assignment of weights in concert with the staff, as well as during the model validation with all key stakeholders.

### **Top level criteria**

The data collection was based on questionnaires sent to the customers, and the staff, to capture their views on the relative weights of the criteria:

#### ***Customers***

For the customers, the standard Customer Satisfaction Questionnaire was used (Appendix O), and specifically the "Importance" the customers assigned to each performance component. These questionnaires were completed recently, so there are no concerns about the relative importance being

outdated. The format of the questionnaire is an Excel spreadsheet, and the drop-down lists were set to middle initial values, to minimize the influence on the customers.

From the European countries, only those with a localization budget were used. The weights assigned are shown below:

Country	Quality	Speed	Cost	Dependability
Czech Republic	Critical (100)	Critical (100)	Critical (100)	Very Important (75)
France	Critical (100)	Critical (100)	Critical (100)	Critical (100)
Germany	Critical (100)	Critical (100)	Very Important (75)	Critical (100)
Hungary	Very Important (75)	Critical (100)	Critical (100)	N/A
Italy	Very Important (75)	Critical (100)	Critical (100)	Very Important (75)
Poland	Critical (100)	Critical (100)	Critical (100)	N/A
Russia	Very Important (75)	Very Important (75)	Critical (100)	N/A
Spain	Critical (100)	Critical (100)	Critical (100)	Very Important (75)
<b>Weighted Average</b>	<b>95.8%</b>	<b>99.6%</b>	<b>90.3%</b>	<b>90.3%</b>

The average is weighed based on the country revenue percentage. For example, if the Czech Republic generates 5% of the product sales revenue, so the weight assigned to the Czech view is 5%.

The dependability is not measured in the standard customer questionnaires. Therefore, the main Regions were contacted by phone, with a single question: “In a scale between 1 (most important) and 5 (least important), how important do you consider the dependability of the Localization group?” To help answer the question, dependability was defined to the customers as “being on time, in budget, and of sufficient quality, every time”. The responses were converted to the same scale as the remaining criteria, in the table above. The countries with small revenue were not contacted for the dependability question, because a sample representing 95% of the voice was considered reliable.

**Staff**

Two factors were seen as internal to the group: Flexibility and HR.

*Flexibility*

In a group interview, each staff member was asked “In a scale between 1 (most important) and 5 (least important), how important do you consider the impact of a sourcing decision, to the flexibility?” Flexibility was defined as the ability to change project priorities, and to adapt to the varying demand. The responses were “3”, “3” and “2”, which are averaged and converted to 58.3%. The views of the staff were weighed equally.

*HR*

In a group interview, each staff member was asked “In a scale between 1 (most important) and 5 (least important), how important do you consider the impact of a sourcing decision, to yourself?” This was equally unanimously valued at “1”, considering the impact of possible redundancies. The group manager was asked “In a scale between 1 (most important) and 5 (least important), how important do you consider the impact of a sourcing decision, to your staff?” The response was “2”. It was assigned equal weight to the group, averaging out to 93.8

**Staff Manager**

In a face-to-face interview, the group manager was asked “In a scale between 1 (most important) and 5 (least important), how important do you consider the strategic factors on a sourcing decision?” The strategic factors were enumerated as dependency on suppliers, hollowing, and reversibility of the decision. The maximum score was assigned.

The top-level criteria weights are shown below. The scale is Critical (100) to Trivial (0):

Criteria	Score	Explanation
Speed	Critical (99.6)	Increased speed is the primary objective
Quality	Critical (95.8)	Quality level must be maintained while the speed is increased.
Cost	Critical (90.3)	Cost is important, but less important than the other criteria, since the it is assumed that additional investment will be recuperated
Dependability	Critical (90.3)	Dependability is very important because it is very visible to the customers. It is not enough to be usually quick; customers must know what to expect and how quickly
Flexibility	Important (58.3)	Flexibility is important because localization requirements fluctuate due to the simultaneous releases of interdependent products. If the fluctuation in demand cannot be met, there is the risk of negative impact on dependability
HR	Critical (93.8)	The impact on HR is critical. The current staff needs to be able to cope with the proposed decision, and to be able to grow and be motivated. Otherwise the support will not be there for the decision to be successfully implemented
Strategy	Critical (100)	Strategy is critical, because it helps align the group efforts with those of the organization

### Sub-criteria

To assign weights to the sub-criteria, the staff was used to help break down the top-level criteria, without customer involvement. This was deemed the best route, because the customers have no knowledge of workings of localization, and could not evaluate for example if the project throughput is more or less important than the transaction throughput. In fact, they would not likely care either. If the speed is increased, does it matter to them how it was increased?

#### **Speed**

The group broke down the speed criterion into two sub-criteria: The Project throughput, and the Transaction throughput. The division was made because it was acknowledged that both external, and internal resources play a role in the speed performance. A supplier may be able to produce huge volumes of work, but if our own company is not responsive to the supplier queries, speed will not necessarily increase.

Both sub-criteria were weighed equally with "1". For the second-level criteria, it is only the relative difference that makes a difference, because they share the weight of the parent criterion.

#### **Cost**

The group manager was invited to assign weights to Fixed and Variable cost. Fixed cost was considered more important with "2" while variable cost was weighed with "3".

#### **Flexibility**

The group brainstormed, and produced a list of two flexibility components: The flexibility to fluctuate capacity, and the flexibility to alter project priorities. The Capacity fluctuation scores were "3,3,2" and the Priority change scores were "5,4,4". These averaged and converted to 58.3 and 16.7 respectively

#### **Strategy**

The group manager was invited to assign weights to Hollowing and Dependency, and to Reversibility, and was invited to raise any other strategic concerns, not already included in the model criteria. Hollowing and Dependency was weighed as "2" and Reversibility as "1".

The sub-criteria follow. The scale is Critical (100) to Trivial (0):

Sub-Criteria	Score	Explanation
<b>Speed</b>		
Project throughput	Critical (100)	This is the key problem to address.
Transaction throughput	Critical (100)	As relationships and communication channels become more complex, the transactions become more complicated and time-consuming. It is very important to take this into account, alongside the project throughput
<b>Cost</b>		
Fixed cost	Very important (75)	Because capacity fluctuates, it is very important to ensure that the fixed costs are minimal, and that the money spent is always for the benefit of completing a project
Variable cost	Important (50)	The variable cost could be considered trivial, in the sense that any project will have cost justification and therefore be taken into account during project approval. However, a rating of "important" is used to take into account the rates at which the projects are undertaken. Having competitive rates can help ensure that budget is available for enough projects, so that the anticipate throughput can be achieved, once the capacity bottleneck is eliminated
<b>Flexibility</b>		
Capacity fluctuation	Important (58.3)	Unless capacity can vary to adjust to the varying expectations, the costs will be too high, or the project throughput will be too low
Priority changes	Unimportant (16.7)	Assuming the capacity can fluctuate, priorities do not need to change as much, and are therefore relatively unimportant
<b>Strategy</b>		
Hollowing and Dependency	Very important (75)	Hollowing and Dependency are "very important" because they reduce the strategic flexibility dramatically. However, they are not "critical" because the needed skills do exist in the market and can therefore be replenished, and the dependency exists to a certain degree, and mechanisms have been found to understand and control it
Reversibility	Critical (100)	For the corporate strategy, control is very important, including the possibility to "change our mind" should the corporate direction change, or should the chosen decision does not perform to expectations.  The simplest scenario requiring such a change is if projects are approved on a ROI basis rather than RI (Residual Income), with such a margin, that the number of approved projects would drop dramatically.

The staff felt that Quality, Dependability and HR needed no sub-criteria.

### Alternatives

The proposed alternatives are:

1. No change
2. Outsource
3. Expand group

Re-engineering is not reviewed as one of the alternatives, because it can be combined with any other alternative presented above. As such the decision to re-engineer is beyond the scope of this work.

These alternatives are described in detail below.

#### No change

Maintain the current set up. In this scenario no additional resources are allocated to the group, but efforts continue for kaizen improvements. The additional demand is not met, and the capacity remains at 100 projects per year, at least in the short term.

While it is clear that “doing nothing” will not solve the problem, including this alternative is important because it demonstrates clearly what the potential benefits are, as well as risks, versus the recommended alternative. The tradeoffs, if any, can be exposed more easily. And because the decision methodology is mathematical, the score of this alternative versus the recommended alternative can provide clues as to the overall benefit.

**Outsource**

In this alternative, localization is outsourced more completely, maintaining only the relationship and vendor management functions. The components of the outsourcing arrangement are:

- The current localization process and distribution of responsibilities
- The new localization process and distribution of responsibilities
- The contractual characteristics
- The assumptions

**The current localization process**

The current localization process, adapted from Esselink (2000) to add the customer tasks, is:

Task	Vendor resources	Customer resources
Track English schedule		PM, HQ groups
Receive source materials from HQ		PM, HQ groups
Discuss business requirements with regional offices		PM, regional groups
RFQ	PM	PM
Analysis of source material	Engineering, language lead	
Review quote, get regional approval		PM, regional groups
Project Kick-off	PM, engineering, language lead	PM
Scheduling and budgeting	PM, engineering, SLVs	
Terminology setup	Engineering	
Preparation of source material	Engineering	
Translation of software	SLVs, translators	PM when there are queries
Review software		PM, Regional groups
Translation of on-line help and documentation	SLVs, translators	
Engineering and testing of software	Engineering	
Escalate and address software problems	PM, Engineering	PM, engineer, HQ groups
Screen captures	Engineering	
Help engineering and DTP of documentation	Engineering	
Escalate and address documentation problems	PM, Engineering	PM, HQ groups
Implementation of updates	Engineering, SLVs, translators	PM
Product QA and delivery	QA, engineering, PM	PM
Project completion and final invoicing	PM, finance	PM, finance

It is important to note that this process varies greatly depending on the project type and complexity, and that tasks are often performed concurrently (Esselink, 2000). For example, the RFQ process itself requires that the vendor tentatively schedule resources, so that the turnaround can be submitted to the customer alongside the cost. If the project is awarded, the resource booking can then be confirmed.

**The current distribution of responsibilities**

Currently, the vendors have the following responsibilities:

*Project manager*

- Provide a customer interface, a single contact for all customer issues
- Receive RFQ and RFP, evaluate them with internal team and their own vendors, and submit quotes or proposals
- Provide project management for the awarded projects
- Provide status reports on costs and schedules
- Manage the vendors
- Participate in yearly business reviews with the customer

*Engineering department*

- Engineer the software, resize the dialogs, build the help system, capture images from the translated software to be combined with the translated help or documentation, according to the customer specification
- Test the software, documentation, and help, escalating problems to customer
- Manage the translation memories
- Manage file transfer and project archiving
- Preprocess materials so that word counts and other work volumes can be calculated for the quote, and for the work itself

*SLVs, translation department, or external freelance translators*

- Translate or coordinate the translation of software and documentation

*Desktop publishing department*

- Desktop publish (DTP) the translated documentation

*QA department*

- QA the materials reviewed from the SLVs

*Language lead*

- Review the source materials with view of predicting translation problems, such as cultural issues, non-correspondence of concepts, or ambiguity

Typical of the industry, our organization has the following responsibilities:

*Project manager*

- Track the English product release schedule, so that regional offices can be advised of upcoming candidates for translation
- Receive source materials from the corporate HQ
- Discuss business requirements with the regional offices
- Select, qualify and train localization vendors
- Send RFQ and RFP to the vendors
- Review vendor quotes and proposals
- Send source and reference materials to vendors
- Resolve simple technical queries from the vendors
- Mediate for the resolution of complex queries
- Mediate for their product certification, specify what reviewers need to focus on
- Maintain the schedule and budget for their assigned projects
- Monitor vendor performance
- Report problems with source materials to HQ
- Provide internal reports on schedule and budget performance
- Report localization plans to HQ
- Conduct technical reviews (e.g. page formatting, resolution of graphics etc)
- Mediate for the posting of released products on the on-line distribution site
- Upload translated files into source code control system
- Participate in yearly business reviews with the vendors

*Engineer*

- Advise on technology issues
- Resolve technical issues beyond the capability of the project managers
- Develop automation scripts
- Help structure unstructured projects
- Optimize internal processes and workflows
- Create production masters for production
- Provide technical support to the project managers
- Work with vendors to increase efficiencies by adapting processes and source deliverables

***The new process***

<b>Task</b>	<b>Vendor resources</b>	<b>Customer resources</b>
Track English schedule	PM	PM, HQ groups
Receive source materials from HQ	PM	HQ groups
Discuss business requirements with regional offices		PM, regional groups
RFQ	PM	PM
Analysis of source material	Engineering, language lead	
Review quote, get regional approval	PM	PM, Regional groups
Project Kick-off	PM, engineering, language lead	HQ groups
Scheduling and budgeting	PM, engineering, SLVs	
Terminology setup	Engineering	
Preparation of source material	Engineering	
Translation of software	SLVs, translators	HQ groups, when there are queries
Review software	PM	Regional groups
Translation of on-line help and documentation	SLVs, translators	
Engineering and testing of software	Engineering	
Escalate and address software problems	PM, Engineering	HQ groups
Screen captures	Engineering	
Help engineering and DTP of documentation	Engineering	
Escalate and address documentation problems	PM, Engineering	HQ groups
Implementation of updates	Engineering, SLVs, translators	
Product QA and delivery	QA, engineering, PM	
Project completion and final invoicing	PM, finance	PM, finance

Essentially the vendor project manager and engineer would bypass the customer's project manager, and communicate directly with the client internal groups.

***The new distribution of responsibilities***

In the outsourcing scenario, the only functions kept in-house are:

- Discuss business requirements with the regional offices
- Manage vendor contracts
- Manage vendor performance
- Provide internal reports on schedule and budget performance
- Manage relationships between vendor and internal groups (new responsibility)
- Mediate as internal consultant for resolution of problems (new responsibility)
- Pursue Kaizen improvements

***The contract characteristics***

- In order to allow time for the arrangement to be tested fully, time needs to be allowed for the processes to crystallize, and the relationships and communication matrices to be fully developed. The agreement term will be one year. This way, seasonality of demand, if present, will put capacity fluctuation to the test, and everyone involved will have the opportunity to go through a full cycle of holidays, vacations, and other obligations
- The new arrangement would require the vendors to add to their responsibilities, communication with various internal groups, primarily the HQ groups who originate the source, as well as the regional groups who are responsible for the product reviews. As a result the vendors project management rate will increase
- Because the costs would remain project-based, the cost will increase for the variable costs, but there will be no term charges
- The rates are guaranteed for the year
- The agreement will not be exclusive. Two vendors will be used concurrently
- The performance review will be monthly, and the following metrics will be monitored and communicated

- Budget
  - Total cost of active projects, per country
  - Committed costs, per country
  - Percent of monthly budget absorbed
  - Invoiced in last month
  - Invoice schedule
- Schedule
  - Release schedule with visibility of up to six months
  - Projects released in the last month
  - Percentage of projects on-schedule
  - Maximum project delay
  - Average project delay
  - Pareto of originator of delays for delayed projects i.e. lack of support from the customer, review taking too long, delay on vendor side due to capacity, delay from re-work of quality problems
- Quality
  - Number and severity of quality issues raised by source
  - Number and severity of quality issues pending by source
  - Pareto of fault originators, i.e. was the fault due to fault in source materials, fault in handling instructions, lack of support, deficient QA on the vendor side
- Process
  - Process improvements needed
  - Process improvements under review
  - Process improvements in progress, with anticipated results
  - Process improvements complete, with results
- Relationships
  - Relationship difficulties
  - Communication difficulties
- Performance deviations will be shared between the vendor, the staff and the affected internal groups, with a focus on process improvements
- The vendors will need to create and maintain complete documentation of the processes used, which the client will have access to. The client will not share such information with other suppliers, as this confidentiality is protected by the Non-disclosure agreement (NDA) signed by the client
- If performance is inadequate for more than three months, the client can terminate the agreement
- If the client support is not adequate for more than three months, the supplier can terminate the agreement, or request re-negotiation of rates

### Expand group

Expanding the group is one way of increasing capacity to meet customer demands. The assumptions of this alternative are:

- Kaizen improvements continue to improve productivity, but
- The increasing complexity of new products and new technologies balances out the productivity gains, and therefore
- Productivity remains at 50 projects per project manager per year. As such
- Six project managers are needed to increase the capacity from 100 to 300, i.e. an additional 4 project managers need to be hired
- The option of changing the roles of the staff, for example for the engineer to operate as project manager was deemed inappropriate, because of skills mismatch, as well as lack of interest for the engineer to develop in that direction
- Hiring of the additional people could start immediately, but care would be taken to give time to new hires to integrate into the group and company culture, by spacing out each hire by at least one month
- Given a decision of no earlier than April, the typical two month warning period for people changing jobs, the required skill set, and training requirements, the alternative to expand the group would take between six and twelve months. In essence this solution could not be fully implemented before 2003
- The training requirements for new hires would reduce the group throughput initially, as current staff would have to divide their time between production and training and support

- The cost of hiring new people is estimated at one salary paid to the recruitment agency, and three months' salary lost in productivity because of the new hire's learning curve, and the time taken by the current staff for the training
- Work among the group would continue to be distributed in a similar manner, by product specialization
- All members of the staff would have the same contacts on the vendor side, as well as the various internal groups. This would increase the time requirements of all client internal groups, as they would have to provide support for 300 instead of 100 projects. The requirements would increase also for the suppliers because of the increased number of projects. The work would also increase for the regional groups who would be called upon to review, on average, three times as many projects
- The staff could increase the vendor base, if the current vendors were found unable to cope with the increased capacity
- To maintain coordination, the weekly conference calls would continue
- All members would participate in the yearly localization summit at the HQ, and the yearly vendor reviews. The costs per person for these events amount to one salary per year
- More management time would be required because of the increased group size. This would be accomplished by promoting one member of the current staff, or by hiring a manager from outside the group

## ***Validation of the model***

### **Theories**

The criteria and sub-criteria take into account the themes of advantages, disadvantages and risks found in the literature review:

- Efficiency, improvement of operational performance
  - Cost
  - Speed
  - Dependability
  - Quality
  - Flexibility
- Strategy, flexibility to redefine the organization
  - Hollowing and dependency
  - Reversibility
  - Competitive advantage – although this is not listed in the criteria, the standard Non-disclosure agreement (NDA) signed by all external parties irrespective of work relationship, is meant to protect against loss of intellectual property rights and confidentiality leaks
- Image, how the operation looks in the books or to the stakeholders. Loss of internal coherence is avoided through the setup of appropriate communications in the alternatives description
  - Efficiency criteria, for example fixed versus variable costs, speed, quality and dependability
- Human resources and Politics
  - HR criteria

Lonsdale's (1999) risk management model is taken into account as follows:

- Competitive advantage
  - The competitive advantage of our company is considered to be
    - Pioneering new technology
    - Intimate knowledge of the needs of end-users
    - Continuous improvement of the product and service portfolio
    - Software development
  - Resources responsible for the competitive advantage are therefore
    - Product management staff
    - Software development groups
    - Marketing and sales staff
- Must avoid monopolistic or oligopolistic supply markets
  - The localization industry is anything but monopolistic. Multiple vendors offer similar services at similar rates

- Must manage the risk of post-contractual dependency
  - The risk of post-contractual dependency will be reduced by making process documentation part of the agreement with external parties, so that the internal staff can take over the processes with the shortest possible learning curve

## Stakeholders

The resulting scores were discussed with the group and the management, to reveal any peculiarities or gaps, as discussed above. The questions asked to the staff in a group discussion were:

1. Do the relative scores make sense? For example:
  - a. Is it reasonable to assign the highest score to Strategy, and the lowest to Flexibility?
  - b. Does it make sense to assign equal weights to Cost and Dependability?
  - c. Is Speed really more important than Quality?
  - d. It is reasonable to assign higher score to HR than to some of the customer-set criteria?
2. Does any criterion or sub-criterion seem to be missing from the list?

The responses formed during the discussion were:

1. Yes
  - a. Corporate context is more important, and no solution could be implemented without corporate support, even if the customers desired this. Flexibility, while important, does seem less so than the remaining criteria
  - b. It is too difficult to answer to this question. The responses of the regional offices were taken as valid
  - c. Because the regional offices are happy with the Quality but not with the Speed, their response may in intended as an expression of the current problem, not the relative weights. This may indicate a bias in their response, which will be investigated during the sensitivity analysis, should the recommended decision not appear robust
  - d. The difference is very small, and it can be investigated further if sensitivity analysis reveals such necessity
2. No new criteria were proposed

The scores of the sub-criteria of one criterion do not need to be compared against scores of another criterion. This is because their relative weight is only related to the top-level criterion. Further, it makes no difference if Project throughput and Transaction throughput are weighed 100-100 or 50-50, because the resulting weight will be 0.5 in either case.

Criteria	Score	Relative Weight	Sub-criteria	Score	Relative Weight	Overall Weight
Speed	99.6	0.159	Project throughput	100	0.500	0.079
			Transaction throughput	100	0.500	0.079
Quality	95.8	0.153	-			0.153
Cost	90.3	0.144	Fixed cost	75	0.600	0.086
			Variable cost	50	0.400	0.058
Dependability	90.3	0.144	-			0.144
Flexibility	58.3	0.093	Capacity fluctuation	58.3	0.777	0.072
			Priority changes	16.7	0.223	0.021
HR	93.8	0.149	-			0.149
Strategy	100	0.159	Hollowing and dependency	75	0.429	0.068
			Reversibility	100	0.571	0.091
<b>Total</b>		<b>1.000</b>				<b>1.000</b>

The scores were not discussed with the regional offices at this stage. The intent was to discuss them if the recommended alternative was not robust enough to accommodate small differences.

## Alternatives

In order to validate the alternatives, the various alternatives were discussed with the current staff and management, as described above.

One of the key concerns raised during the staff discussion, was whether the other internal groups would be able to cope with the additional requirements put upon them, as the number of projects increases. For example, the HQ groups might find that supporting six product managers would be too demanding, irrespective of whether these are internal staff, or vendor-based. The regional offices themselves, the

customers benefiting the most from the increased scope of localization, could well be unable to cope with the responsibility of reviewing three times as many products.

Because the requirement for support and product certification increases by the number and complexity of projects rather than the originator of the queries, it is assumed that the internal groups can be consulted during the model validation stage (step 5a), following the generation of the recommendation.

Regarding the outsourcing scenario, the prospect of a full outsourcing model was discussed with the two main suppliers, and they were invited to respond independently to the following questions, sent by email. The background of the decision was given over the phone:

1. After reading the Methodology-Alternatives section, do you find the potential outsourcing model technically feasible? Could a vendor cope with direct communication with the various internal customer groups?
2. Should we choose a fuller outsourcing model, would you be interested in the business?
3. What experience, if any, do you have experience in such an outsourcing model?

The responses were:

1. Both suppliers agreed that the model was feasible. One vendor commented that direct communication would in fact be preferred, because on some occasions it was time-consuming to have their queries resolved from our group. The other vendor found it preferable, as long as the communication matrix were clear
2. Both vendors expressed interest in the business
3. One of the two vendors has a similar arrangement with two of their customers, and has found the model to be effective. The other vendor has not such experience

Both vendors immediately offered to discuss additional services, such as internationalization consulting, and testing outsourcing, which are not investigated in this paper, but are investigated separately.

One of the vendors was especially interested in stressing the advantages of outsourcing, particularly with regards to improvement in quality. Not surprisingly, it was the vendor offering outsourced testing.

The vendors had not major comments on the other two alternatives, although one of the vendors expressed interest in providing additional services, irrespective of the outsourcing decision.

## Summary

By using the above data, the Double-loop SMART framework may be populated, and the description of alternatives will help evaluate the performance of each alternative versus each criterion and sub-criterion.

The first step validation is deemed sufficient at this stage, because the model is iterative, and step 5 allows for a re-validation of the model in view of the results. Sensitivity analysis can help focus on the areas of the model, where the results are less robust. For example, if quality is the area where the recommended alternative has similar scores to the second alternative, the quality aspect can be revisited to ensure that nothing has been missed. Where the difference between the recommended alternative and the second best candidate is large, there is no need to re-validate.

## Analysis

Having established the structure of the Double-loop SMART framework, and having assigned the weights for each criterion, the next steps are:

1. Assign scores of each criterion or sub-criterion against each alternative under examination
2. Calculate the results, in order to generate a recommendation
3. Perform sensitivity analysis to test the robustness of the results
4. Assuming they are stable, proceed to step 5 of the model, evaluate the model in view of the recommendation

## Alternatives scores against criteria

The scores of each alternative were derived as an average of the scores assigned by the staff in a group discussion. Each alternative was scored here against each criterion, in a scale between Maximum (100) and Minimum (0). Because these are only estimates, it was assumed that five possible values (100-75-50-25-0), averaged, would provide a reasonable approximation. Where the difference of opinion was by more than one step, a discussion ensued to clarify whether the difference was due to different interpretation or different evaluation. Different interpretation was discussed until resolved, but different evaluation was allowed to affect the average score at this stage. No difference by more than one step was present.

The score refers to performance rather than magnitude. For example a cost score of 100 will mean very cost-effective. Explanation of why each score is chosen follows. The scores in parenthesis are the scores assigned individually, as well as their average.

### **Speed: Project throughput**

- **No change:** Low (25-25-25: 25). The current throughput is low, and needs to double or triple. No amount of re-engineering is likely to do this in the short and mid-term, while of course productive improvements are pursued and achieved.
- **Outsource:** High (75-75-50: 66.7). External vendors can vary their capacity based on the work requirements. For the translation they use freelancers, so the only limit to capacity is the limit they impose on the maximum number of translators they allocate to a project. Such limit is set to minimize variation in style during translation, and to facilitate consistency in terminology. Up to a maximum of four translators are typically used, and the vendor manager on the vendor side makes every attempt to use the same translators for future updates of the same translation, to ensure consistency over time. MLVs (multi-lingual vendors) often use in-country SLVs (single-language vendors) who, in their turn follow the same rules for consistency across the product and across versions.

Engineers are usually salaried employees, but additional engineers can be hired on a project-basis, taking over the less complex tasks, not requiring in-depth knowledge which they may not have. Further, assuming a sourcing agreement which will indicate, if not guarantee, some sort of steady flow of engineering work, vendors can find skilled engineers to increase their capacity mid- and long-term.

DTP capacity can be fluctuated if necessary, as the skills needed are generally available, and projects can be allocated in-house or off-site.

Functional and technical testing can be done in testing centers, which allows vendors to vary their capacity significantly. Linguistic testing is handled at two levels on the vendor side, once at the SLV site, and once more at the MLV site. Capacity is not a problem usually, because linguistic reviewers can handle much larger volumes than translators, and are also available in the free market on a contract basis.

Project managers often act for the vendor also as vendor managers, account managers, and relationship managers, but most of their time is spent on project management. Allocating tasks, and following up so that they are completed on time. Project managers are abundant, however good project managers are not. Managing many projects at the same time is reasonably complicated in itself, and the outsourcing alternative would add many tasks to their long list. Interfacing potentially with multiple

parties is more time consuming than having a single contact in the current scenario, where the vendor PM only communicates with the customer PM.

The bottleneck of an outsourcing scenario on the vendor side would likely be on the expanded project management function, increased complexity of communication matrix, and familiarity with the client organization roles.

- **Expand group:** High (75-75-50: 66.7). Since the bottleneck in the current throughput is the internal resources, the project managers and the engineer, it makes sense that hiring more people will increase throughput. Further, a larger pool would enable more skills transfer, filling-in for absence, and specialization by product and technology.

### ***Speed: Transaction throughput***

- **No change:** Moderate (50-50-50: 50). The current throughput is moderate, because while the internal employees have the trust of the other internal groups and the knowledge who to contact, progressively more issues are being escalated to the HQ for resolution, due to the increasing scope of projects and technologies handled. The escalation itself adds no value to the end product, and delays in fact the resolution of some problems where the vendor could be addressing the internal group directly.

For the issues that are addressed in the European office, the turnaround is quick, and knowledge as well as location can be leveraged more fully. Further, relative proximity with the regional offices often facilitates transactions.

- **Outsource:** Moderate (50-50-50: 50). Outsourcing would reduce the transaction throughput for the vendor in some cases, but increase it in others, depending on whether the issue is currently resolved without escalation. The communication matrix would be more complex, but more direct, as they will transact more directly with the customer groups, including the internationalization team in the HQ for instructions and regarding the localizability of source materials, the development and certification team regarding problems found which are not specific to the translated product, and the regional offices who are in charge of the terminology and product reviews.

Particularly problematic could be the regional groups, whose conflicting priorities between product certification and their core functions might make them less responsive in addressing an external company in place of colleagues.

Further, until trust is developed between the vendor and the various internal groups, transactions may be scrutinized more than necessary, or multiple times. This will introduce delays not present currently, where the motives of the internal employees are less likely to be viewed with suspicion by their colleagues. Time zone differences will also introduce a delay, as European vendors have a smaller window in which to discuss issues with the HQ.

However, because additional capacity would be used to localize newer products, and because the staff is not familiar with these newer products, the direct communication between vendor and internal groups could compensate for the lack of leverage of the internal relationships.

- **Expand group:** Low (50-25-25: 33.3). Expanding the group would increase the internal project management and engineering capacities, but would introduce additional intermediate communication layers. The communication matrix would become larger and more complex as multiple people would be contacting various internal groups, as well as the regions, and the vendor. Further, increased capacity would mean that with more projects running, more internal coordination would be necessary, to ensure product version dependencies are met, alongside regional priorities.

### ***Quality***

- **No change:** Moderate (75-50-50: 58.3). As seen from the customer satisfaction questionnaire, the localization quality is perceived by the internal customers to be satisfactory, but not exceptional. The project managers need to meet certain quality criteria, however since these are not quantified, subjective judgment is often used. Based on experience, the internal project manager can evaluate that

a problem may be important enough to hold the release of a product, to release the current version without the fix and put the fix in the next version, or to just ignore a quality issue that is deemed unimportant.

- **Outsource:** High (75-75-50: 66.7). As long as quality is measured, a vendor may offer an improvement in product quality. The vendor will not be as likely to cut corners where the work is based on the work itself, and will be motivated to escalate decisions regarding problem fixes, in hope that additional work will be generated either directly in the project, or as a special consultancy project undertaken alongside product localization. This could be a reasonable alternative, given the skills pool on the vendor side and a reasonably long-term agreement which would warrant investment by the vendor.

Free from the everyday tasks of project management, file transfer and work coordination, the customer staff would be able to look at the bigger picture, coordinate the activities from a higher level, and evaluate and approve such additional projects within the context of process improvement.

Quality is one of the key issues that need to be monitored in an outsourcing scenario, and much of the time of the current staff would have to shift in that direction.

- **Expand group:** Moderate (75-50-50: 58.3). Since lack of speed is the key problem, some of the decisions that favor speed over quality are likely to tilt in favor of quality, given enough resources. However, staff would be hired only assuming they would be at least as busy as the current staff. Furthermore, given the potential quality problems from lack of efficient internal coordination or personal style, quality standards would need to be introduced and the performance monitored.

#### **Cost: Fixed cost**

- **No change:** Moderate (50-50-50: 50). The fixed cost performance is considered moderate, because it is the starting point for evaluating the other alternatives. The fixed cost includes the salary and benefits of the staff of three, and their contribution to infrastructure expenses.
- **Outsource:** High (75-75-75: 75). There is a temptation to assign equal fixed cost performance in both the “No change” as well as the “Outsource” scenarios, because the fixed costs would be the same, assuming no redundancies. However, when compared to the total value of projects undertaken, the fixed cost performance is increased in an outsourcing scenario.

Should the work maintained by our company not be sufficient to employ three people, the fixed cost performance would be increased further.

- **Expand group:** Low (25-25-0: 16.7). Doubling or tripling the group would increase the fixed costs by more than that amount, because of the increased overhead of coordination. Therefore the cost performance would be reduced. Further, an increased group could have lower cost performance per unit work, because the coordination costs.

#### **Cost: Variable cost**

- **No change:** High (75-75-50: 66.7). The variable cost performance is high because the external cost would be zero when no projects are running, and there would be some internal cost from tracking the schedule of the English products and source technology.
- **Outsource:** Moderate (75-50-50: 58.3). The variable cost would be moderate if, in addition to the internal staff, vendors would also need to track the source schedules and anticipated work volumes as an aid to planning and capacity management. This would essentially increase transaction costs, which are taken into account here.
- **Expand group:** Moderate (75-50-50: 58.3). The variable cost would be reduced from High to Moderate, as additional coordination would be needed, getting progressively more complex as the number of people and projects increase.

***Dependability***

- **No change:** Moderate (50-50-50: 50). Currently the dependability is moderate, with an on-schedule performance of around 80%, and cost performance of 90%. There is a trend for this performance to increase, as the measurement system becomes more robust, and the internal coordination is improved.
- **Outsource:** High (75-75-75: 75). External vendors would be motivated to increase capacity and therefore their revenue, as well as develop a history of success in the collaboration, in hope of continued engagement past the initial agreement. The dependability of the vendors currently used is 90% for schedule and 100% for cost. Freed from the technical details of projects, the customer staff would be able to focus on vendor performance more, which would contribute to the vendor's increased performance.
- **Expand group:** Moderate (75-50-50: 58.3). With a bigger team, a larger resource pool could better balance load, and cope with a higher load. However, because of headcount restrictions, the internal resources would not likely be allowed more slack than the current ones. Since headcount usually chases demand, the projects would have to more than double, before doubling the resources. In addition, the increased overhead of internal communication would not necessarily add to the current level of dependability.

***Flexibility: Capacity fluctuation***

- **No change:** Low (25-25-25: 25). Capacity cannot fluctuate significantly, because of the wide range of activities performed in-house. While the number of vendors and projects increase, the internal staff does not have the time to effectively support the increased number of vendors or projects, and response times from our company to the vendors increase for the less important projects.
- **Outsource:** High (75-75-50: 66.7). While translation resources are virtually unlimited and engineering capacity can be subcontracted, good project management on the vendor side is in short supply. Conflicting priorities with other customers, and seasonal demand fluctuations could prevent the vendors from achieving high capacity fluctuations when these fluctuations are needed the most. Vendors would of course want to increase capacity only as long as they could be assured of high utilization. However, quarter-end and especially year-end pressures for software publishers tend to increase demands for the vendors industry-wide. Further, many of our products are interdependent, and are released in clusters. The release of localized versions of these products would also need to be released in clusters, so that a whole suite is available in a language.
- **Expand group:** Moderate (75-50-50: 58.3). A larger internal staff would be able to support additional vendors, even where the current ones could not fluctuate capacity. Therefore the overall capacity fluctuation would be improved, although only in one direction. Slack periods because of seasonality in product release could be unproductive, and more importantly they could risk of perpetuating a slower work pace, which would reduce productivity even in busier periods. Assuming the organization is a "defective monopoly", there could be an escalation of resources demanded in order to meet schedules and budgets.

***Flexibility: Priority changes***

- **No change:** High (75-75-75: 75). Project priorities can be changed reasonably quickly and easily. Vendors handling multiple projects have no major objections to focusing on the more urgent projects, even as internal priorities shift.
- **Outsource:** High (75-75-75: 75). The priority change flexibility would not change if external vendors managed the projects; the internal staff would ensure that projects are handled in the most desirable sequence. The flexibility would not necessarily increase either, because the same overheads would apply for the vendors with putting a project aside to focus on another.
- **Expand group:** Moderate (75-50-50: 58.3). An increased number of staff, with each focusing on a product set, could introduce priority conflicts. For example, if one internal project manager was managing a higher priority project, the managers of a secondary project could find themselves

continually at the end of the queue for internal or external resource time. While performance measurement and rewards are based on group performance, issues of motivation and pride in own work could lead to project managers competing for resources.

### **HR**

- **No change:** Low (25-25-25: 25). With the work demands increasing and unmet, motivation is low because the turnaround performance cannot be increased to meet customer demand, unless sacrifices are made elsewhere, for example in quality.

Career growth opportunities are limited, because of the size of the group. Furthermore, the skills developed in this position makes all staff important to the group, and promoting them to other groups would introduce resource and skills gaps.

- **Outsource:** High (75-75-50: 66.7). This is an area of high uncertainty, because the skills needed in an outsourcing scenario are different than the ones needed in the current scenario. Someone who can manage localization projects may not be able to cope with managing networks of relationships instead. The engineer, who is most comfortable going into the technical details of the technology, may feel out of place and out of touch managing the technology contracts without involvement in the coding itself.

Nevertheless, the new roles in an outsourcing scenario would necessarily imply an increased level responsibility and level of work, which would at least offer the opportunity for growth, even though it would not guarantee that the growth would actually take place. The responsibilities of contract management, negotiation with various internal and external parties, and the simple positioning of relationship or vendor managers would likely be perceived as a reward, and would lead to increased motivation.

Inability of the staff to function in such a new scenario could be detrimental or beneficial to their growth, depending on other opportunities offered within the company or elsewhere.

- **Expand group:** Moderate (75-50-50: 58.3). Increase in the size of the internal group would increase career opportunities, as some staff would likely be promoted to help manage the bigger group. The improvement of growth opportunities is here too uncertain, because for the impact on the rest of the staff. Despite the risks, growth opportunities would be likely for at least some of the staff, whether in the context of an official promotion, or in the capacity of seniority in a larger group.

Specialization could be seen as an opportunity for growth, and clearly, being able to better cope with the workload and providing a better service to the internal customers would be motivating and rewarding.

In the increase of any group, there is always the risk of conflict, as the match between the existing staff and the newcomers cannot always be known in advance. Further, an increase in staff that is not gradual could lead to break down of the internal culture, with the stronger personalities of the newcomers teaming up in their search of place in the group. Such eventuality could facilitate the integration as the group moves quickly from storming to norming and performing, but could also lead to conflict and low morale.

### **Strategy: Hollowing and Dependency**

- **No change:** Moderate (50-50-50: 50). Until recently the group maintained a reasonably high level the skills needed to do the job, and could educate internal groups as well as train new vendors. When a vendor under-performed, and coaching for extended periods did not lead to satisfactory performance, a new vendor was selected and trained, as a replacement to the under-performing vendor. Therefore the dependency on the vendors was low, and the score was high.

However, the increased number of products, groups involved, and disparate technologies, have introduced progressively more cases where technical or other queries need to be escalated. Therefore, while the skills have not reduced per se, the increased demand has introduced an effect of hollowing, even though the skills are not found in the vendors either. As a direct result of this hollowing, the group depends on vendors for translation technology issues, and on other internal groups for internal technology issues.

- **Outsource:** Low (25-25-25: 25). Should the outsourcing scenario be chosen, the internal skills would shift alongside the responsibilities. As the group adjusts to this change either by learning new skills and forgetting the old, or by changing the team members to better suit the new expectations, the result will be increased hollowing, i.e. skills degradation, with respect to the current setup. It could well be that the hollowing does not actually become a problem, and that the outsourcing scenario performs very well. However, it would actually reduce the strategic flexibility because a decision to reverse the decision or simply to manage some projects internally would be hindered by the lack of the appropriate skills.

With the details of the technology no longer being the focus, the vendor expertise would no longer be known as a result of the queries they pose. Instead the other internal groups would need to be called upon to help form an opinion, and this would increase our dependency to both vendors as well as other internal groups. With the internal groups interacting more directly with the vendors, the “chemistry” they would develop could affect vendor selection, and the performance of the relationships themselves. Since “chemistry” is largely dependent on chance, there is the risk that a vendor would work well with one internal group but not another.

Where vendor performance would not meet expectations, the failure could be from the vendor or the internal support they get from the various internal groups. Resolving such problems would require increased dependence on third party opinions, whether internal or external.

More critically, if the relationship were successful initially, the internal staff would focus progressively on higher level, strategic issues, thereby increasing the hollowing and dependency. The vendor could leverage the internal relationships for increased performance, and not rely as much on explicit, written procedures. Later, should this relationship become ineffective, the new vendor would have to replicate the success in the network of relationships, and even the culture necessary to cope. Because this is known in advance, the dependency to a vendor would also be known, and would increase alongside the success of the relationship.

- **Expand group:** High (75-75-75: 75). An increase team would allow members to focus on certain skills or develop a wider set, or both. Instead of hollowing, there would be skills enrichment. This could give the company more opportunities as a result from the increased flexibility.

Direct result from the increased skills, the bigger group would be less dependent on vendors as the skills would be there to train new vendors as needed. The dependence on internal groups could also be reduced, as the group could develop the skills to handle more complex queries from the vendors, without escalation to other groups.

### **Strategy: Reversibility**

- **No change:** High (100-75-75: 83.3). Since no decision has been taken, the reversibility could be seen as maximized. However, strategy is a chess game already in progress, and the group is already present. Decisions for growth or not need to take into account the impact on the current staff. One of the possible decisions is to change nothing. Such a decision could lead to some of the staff leaving the group or the company, and the effect could therefore be reversible or not.

Since taking some kind of decision is inevitable before increased demand is met, the decision of “no change” can be seen as the decision taken temporarily.

- **Outsource:** Moderate (50-50-50: 50). The reversibility score would be reduced in an outsourcing scenario, because the effect it would have on the staff would be more certain. People would be able to cope and feel they have grown, or could feel de-motivated and leave.

Contractual obligations regarding duration of agreement, if undertaken, would reduce the reversibility of the decision, at least for the duration of the agreement. A new vendor could then be selected if necessary, with the dependency shifting from one to another.

- **Expand group:** Minimum (25-0-0: 8.3). Because local employment laws are very protective of employees, expanding the group would not be reversible in a practical way. Staff with transferable skills could find opportunities in other departments, but there is no guarantee this would happen.

## Uncertainty

Because most ratings given to future events are predictions, there is some uncertainty involved, which may affect the choice of the best alternative. When two alternatives have equal score but one involves more uncertainty, it is simply a riskier alternative.

Criterion® DecisionPlus® offers the possibility to enter uncertainty distributions for each score, so that the robustness of the decision can be evaluated in context. Entering uncertainty scores does not change the scores of the alternatives. Instead it adds the composite uncertainty variable to the previous scores, and within the specified uncertainties, different alternatives may be optimal. A recommendation, which is unchanged despite the uncertainties, is clearly more robust than one that assumes no uncertainties.

The range of options supported by Criterion® DecisionPlus® is:

- **Uniform distribution:** When a value is known to be between a minimum and a maximum, but the likelihood cannot be estimated more accurately.
- **Triangular distribution:** When a most likely value is known in addition to a highest and a lowest bound.
- **Normal distribution:** When the values are uncertain, but the average can be estimated.
- **Log normal distribution:** When a distribution starts at one extreme, but is open at the other.
- **Custom distribution:** When the probabilities of some key values are known.
- **None:** When there is no significant uncertainty.

The uncertainties entered in the model (Appendix N) are as follows, as agreed in a group discussion. Criteria or sub-criteria not listed in Appendix N, imply no uncertainty. The discussion posed for each alternative-criterion score was: "How sure can we be of the score we have assigned?" The response was formed as:

- 0: We are reasonably certain
- 10%: We need to allow for 10% variation. For example, if the score averages to 58.3, we would like to allow a standard deviation of 10%, giving a range of 48.3 to 68.3%. This option is the default, where normal distribution is chosen below.
- 20%: We need to allow for 20% variation.

Where there was disagreement, the maximum uncertainty was used rather than the average. This seemed a safer option, better able to capture the risks. At no case was more than 20% proposed, although this option was not excluded.

### ***Speed: Project throughput***

- **No change:** None. The current throughput is known to be 50 projects per project manager per year.
- **Outsource:** Normal distribution of uncertainty. We know the vendors do not have the same headcount restrictions as we do, so they are better able to handle larger volumes of work. They already have the benefit of economies of scale and scope, and feel safe to assume they can leverage these. However, the specific people allocated to our projects may not be as good performers as expected. Good performers in the scarce skills such as engineering and project management may be difficult to find, or so expensive that the vendors might hesitate to employ them. Assigning normal distribution allows for some fluctuation in the capacity, derived from uncertainty about the availability of skills, not only to the vendor, but also more specifically to our account. A skilled resource not available to our projects does not contribute to project throughput, at least not directly.
- **Expand group:** None. While some uncertainty can be reasonable to assume, careful management including staff selection, training, and performance measurement can control throughput.

**Speed: Transaction throughput**

- **No change:** None. We can assume that the transaction throughput remains predictable.
- **Outsource:** Normal. There are uncertainties in whether the external vendor will be able to cope with the multiple internal groups as effectively, so the transaction throughput may be reduced. However, because the internal staff in Europe will not act as transaction brokers, the intermediate layer will be removed. Initially each query will be seen as escalation, but as the vendors build relationships with the various internal groups, it is reasonable to expect they will be able to leverage it, and improve performance versus now.
- **Expand group:** Normal. The expanding intermediate communication layer would likely reduce transaction throughput, as a tradeoff for better quality and better vendor support. However, depending on how well the group is managed, and how effective the communications are, the performance could also increase.

**Quality**

- **No change:** None. The current quality is known.
- **Outsource:** Normal. Direct communication between the vendors and the regional offices, without some sort of central coordination, may introduce quality variations as the regional reviewers are likely to use their discretion in what is acceptable quality and what not, irrespective of centrally defined standards. Because they are the customers of the localization service, some degree of discretion is reasonable. The uncertainty in the quality then depends on both the personality of the individual regional contact, as well as conflicting priorities they may have at the time of the review.

At the same time, vendors, having more complete ownership of the projects, will likely feel that the quality of work shown will be seen as a personal success, and will act as motivator for improved performance for career growth. Not as susceptible to cutting corners, the quality may just as easily be better than “high”.

- **Expand group:** None. Introducing new people into the group may introduce variation in quality, but since the additional people will be internal to the organization it is reasonable to assume that the quality will be more predictable.

**Cost: Fixed cost**

- **No change:** None. The fixed costs are known exactly.
- **Outsource:** None. The fixed cost performance would increase on a per project basis, but there is no uncertainty there.
- **Expand group:** None. The increase in fixed costs is predictable.

**Cost: Variable cost**

- **No change:** None. The variable costs depend on the amount of work, which is controlled by the internal resources as well as the regional budget. Increased demand is not met. Resources are rarely slack, and there is a history of past costs which are good predictors of future costs, particularly since vendors typically increase their productivity, but not increase their rates with existing accounts.
- **Outsource:** None. The variable cost performance will be less in this case, but no less certain, as the regional budget will still drive the project selection and execution.
- **Expand group:** None. As above, the variable cost depends primarily on the regional budget.

***Dependability***

- **No change:** None. The current dependability is known.
- **Outsource:** Normal. Conflicting priorities, loss of key staff, learning curve of new team members, could all contribute to some variation to the dependability of the vendor. Vendors typically pursue 100% capacity utilization. The motivation could lead to their preference to delay some projects or speed up others.
- **Expand group:** Normal. Introducing new team members raises issues of cultural fit, work ethic, interpersonal dynamics, motivation and job satisfaction, as well as non-work related issues that may affect the dependability of the new group.

***Flexibility: Capacity fluctuation***

- **No change:** None. Capacity cannot be varied, and this is known.
- **Outsource:** Normal. As mentioned in the dependability section, vendors can vary capacity more than us, but not to any level. In the software industry product release is seasonal, to the extent that sales offices pursue their sales quotas at the end of each quarter, and more strongly at the end of the year. Because this seasonality is industry-wide, vendors are under a lot of pressure during these periods. While the capacity is expected to be higher than it used now, it is uncertain how well they will coordinate internally, and with our own internal groups, to meet the capacity fluctuations in a way which is acceptable to the customer, while being cost-effective for the vendor.
- **Expand group:** Normal. Some uncertainty is present here because the dynamics developed in the new group are not known. The bigger group could behave as a well-oiled machine, or have infinitely long discussions regarding coordination of priorities. Further, a drop in productivity during slack periods can become engrained in the group culture, and capacity can then not be met as expected.

The possibilities for skills enrichment can act to increase the productivity and therefore throughput capacity, as the skills are leveraged across the group and between groups.

An expanded group may be better able to handle the internal workload of increased number of projects, but can in turn be limited by the vendor's responsiveness due to seasonality and other capacity utilization issues and talent availability.

***Flexibility: Priority changes***

- **No change:** None. The current flexibility is known.
- **Outsource:** None. One of the key functions of the internal staff would be to coordinate project priorities. As such the vendors could be instructed to change priorities as needed. This has not been a problem to date, and can assume it wouldn't be a problem in such a scenario.
- **Expand group:** Normal. Vendors accept priority changes with only minor difficulty when working with two project managers; working with four or five would introduce some coordination overhead, but also a potential conflict of interest with each project manager favoring their own projects.

***HR***

- **No change:** Normal. This is the single case where the growth opportunities and motivation and morale issues are not fully known, because of the interpersonal dynamics that are difficult to predict. Even if no sourcing decision is taken, people could leave the group, and be replaced by others with different personalities and skills. People within the group could be promoted despite the group size, which could lead to increased productivity and motivation, or reduced motivation and increased conflict.

- **Outsource:** Normal, but with standard deviation of 20%. This is the case of highest uncertainty, and deserves special consideration and careful career planning. There is the temptation to assign a uniform uncertainty distribution; however, no scenario would be chosen if it were so destructive to the careers of the current group, so the lowest scores could be safely excluded.
- **Expand group:** Normal, with standard deviation of 20%. Some significant uncertainty comes into play in this option too, as the dynamics of the new group are largely unknown. Along with the group-size increase, there would be an increase in expectations. This could lead to conflict regarding project priorities, scarce resources, and work methodologies.

#### **Strategy: Hollowing and Dependency**

- **No change:** None. The only risk of hollowing is from the increasing complexity of the work itself, and can be reasonably predictable.
- **Outsource:** Normal. The skills degradation is expected, but the degree of degradation is uncertain. We could guard against hollowing by at least ensuring that work communication matrices and work processes used by the vendors are documented in detail, so that another vendor, or potentially an internal group could step in and take over if the setup proves ineffective. Nevertheless, if the success of the setup depends on the network of relationships rather than explicit processes, it will be difficult to replicate by using other parties.

In case the procedures can be documented, and good contact maintained between groups, the hollowing and dependency may be reduced.

- **Expand group:** None. A larger group would help guarantee that hollowing and dependency are avoided. Indeed they would be the best way to protect against these risks.

#### **Strategy: Reversibility**

- **No change:** None. The reversibility is an observation, so there is no uncertainty about it.
- **Outsource:** Normal. There is some uncertainty as to the degree of reversibility, once an outsourcing scenario is chosen. It will depend on the hollowing and dependency described above, in addition to contractual obligations for duration or volume of the contract.

While staff could become de-motivated by such as scenario and leave, the effect could be just the opposite, where they would grow and develop a better understanding of the whole picture. The new knowledge could be leveraged to make more intelligent decisions in the future, including different sourcing decisions, or fine-tuning the current decisions. Therefore reversibility could also increase alongside this better knowledge.

- **Expand group:** None. Reducing the number of staff in a group is very difficult under Dutch law, and is protected under many countries where our company has offices. Even if new hires are selected in countries where such protection does not exist, the corporate policy is not to hire and fire staff as a means of capacity fluctuation.

### **Model Calculation**

Appendix A shows the full weights and scores. The results are summarized in Appendix B (Decision results), Appendix C (Contribution of each alternative), Appendix D (Uncertainty in the decision), and Appendix E (Robustness of the alternatives with regards to uncertainty).

### **Model Results**

The results are therefore (Appendix B):

- Outsource: 0.626, the best alternative 99% of the time
- Expand group: 0.500
- No change: 0.483

For reference, AHP gives the same recommendation, with scores:

- Outsource: 0.391, the best alternative 100% of the time.
- No change: 0.307
- Expand group: 0.302

Appendix C shows the contribution of different scores to each alternative. While the uncertainty is not shown here, noteworthy points are:

- Speed, HR, and Flexibility would all benefit from either Outsourcing or Expanding the group
- Cost performance would predictably decrease if the group expands, because of the increased fixed costs with no significant change in the variable cost
- The No change alternative is optimal when considering strategy alone

Appendix F shows that the Outsourcing alternative is chosen over the Expand group alternative, because of better transaction throughput. The No change alternative is the least favored, because of its low project throughput.

Appendix G shows that the Cost performance stands to improve most through outsourcing.

Appendix H shows that capacity fluctuation can be achieved through either Outsourcing or through group Expansion, while all alternatives offer similar priority change possibilities.

Appendix I shows that the strong attribute of group Expansion is the avoidance of hollowing and dependency. The effect is so strong, that it is almost equally good alternative as the Outsourcing alternative. The best alternative overall is clearly the No change alternative, where both the risks of hollowing and dependency are avoided, as well as having the high reversibility.

## Uncertainties

Appendix J shows that all of the uncertainty in the No change scenario comes from the HR effects being unknown. The current staff may grow, or they may leave. Morale may improve despite the workload and competition for resources, or it may be worsen.

Appendix K shows that half of the uncertainty in the Outsource scenario comes from the HR criteria. The staff may benefit by upgrading their role and position in the new context of relationship management, or may find that the work is less interesting, less well matched to the skills they want to be developing, or simply too difficult. The uncertainty from the remaining criteria is limited.

Appendix L shows that almost three quarters of the uncertainty comes from HR criteria. Hiring good candidates cannot guarantee culture match and good interpersonal dynamics, despite everyone's best efforts. Career growth can be spectacular, or restricted.

## Assumptions

Clearly robust, the results depend nevertheless on various assumptions:

- That the future can be predicted reasonably accurately, even within the limits of an uncertainty distribution function
- That the prediction given here is indeed correct, even within the limits of the uncertainty distribution function
- That the scale used is appropriate, detailed enough to capture the differences, but not so detailed that subjective judgments make no sense
- That the weights assigned to the top-level objectives are correct, in the sense that they would generate the optimal solution for the customers, the employees, and the company as a whole
- That the value curves assigned are appropriate, and reflect the true view of the customers regarding value of quality and dependability in particular
- That increasing capacity can not be achieved without increasing the internal resources, nor outsourcing localization more completely
- That the decision tree is structured correctly. Perhaps the higher order criteria should be the stakeholders' interests

To guard, at least partly, against such assumptions, some sensitivity analysis is needed.

**Sensitivity analysis**

Sensitivity analysis (Appendix M) is used to expose in particular potential cross-over cases, i.e. scores which if they are changed slightly would favor a different alternative.

Criticality is the measure used to show how much a score must change, before a different alternative must be considered. As a general rule, if all criticality scores are over 5%, the model is considered to be stable. The criticality scores are:

Criteria/sub-criteria	Criticality
Strategy	27.3%
HR	44.6%
Cost	48.1%
Flexibility	72.1%
Strategy - Hollowing and dependency	86.3%
Strategy - Reversibility	86.3%
Speed	100%
Speed - Project throughput	100%
Speed - Transaction throughput	100%
Cost - Fixed cost	100%
Cost - Variable cost	100%
Flexibility - Capacity fluctuation	100%
Flexibility - Priority changes	100%
Dependability	100%
Quality	100%

In essence this means that the model is very stable to variations in the scores given, and many variables would need to be off in the same direction, before a different alternative becomes optimal.

Expert Choice recommends that Cost be taken out of the decision criteria, until the benefits of the decision can be seen, in fear that a good but expensive alternative never receives proper attention. To test this, Cost is removed temporarily. The scores then become:

- Outsource: 0.616, the best alternative 92% of the time
- Expand group: 0.528, the best alternative 7% of the time
- No change: 0.468

The sensitivity analysis here shows that Strategy has a criticality of 27.0%. The weights or scores of Strategy would need to change by more than 27% before a different alternative emerges as a better alternative. However, increasing the priority value toward the value that would tend to recommend another alternative gives an out-of-range result. This means that the model is stable to removing the cost, and it will not favor a different alternative. Essentially this means that Outsourcing is the recommended alternative even if “cost is no object”.

**Summary**

The calculated results are:

- Outsource: 0.626, best alternative 99% of the time
- Expand group: 0.500
- No change: 0.483

Pointing to recommendation of the outsourcing alternative. The results are robust to sensitivity analysis, model choice (SMART or AHP), and inclusion or not of the cost criterion. Based on the information entered, and the assumptions discussed, the risk of the outsourcing alternative being worse than the second alternative is 1% or less.

**Evaluation of the model in view of the recommendation**

**Validate recommendation**

The recommendation was then discussed with the following groups, to ensure that the recommended solution would be acceptable to them, and to review the final list of criteria and weights:

1. With the customers
  - a. The customers would need to be in direct contact with the suppliers
  - b. The volume of product review and certification would increase dramatically
2. With the HQ internal groups
  - a. The suppliers would be in direct contact with them
  - b. The scope of work would increase dramatically
3. With the staff
  - a. The gap in skills between project management and relationship management would need to be filled by training
4. With the group manager

### ***The customers***

Grave concerns were raised by the regional groups about their ability to cope with so many projects, in view of their resource limitations. It became apparent that while they want increased speed and scope of localization, they would not be able to allocate the necessary internal resources, and that two possible solutions would then need to be reviewed:

1. The review by other internal groups, such as the technical support
2. The review by external companies, with industry expertise for each product under review

Reducing the variable cost performance of both the Outsourcing as well as the Expand group alternatives to zero (implying that any alternative which would increase the scope would increase the regional variable internal cost of the reviews), would still result in the Outsourcing alternative to be recommended, with a score of 0.645, the best alternative at 98% of the time.

### ***The HQ internal groups***

Two colleagues from the HQ were contacted by phone, after the Outsourcing alternative was sent to them by email. The intent was to clarify only the feasibility of the model. There were no concerns with the direct contact with the suppliers. The interest was expressed to keep the total number of suppliers reasonably limited, so that the HQ groups would not need to support many different companies.

It is worth noting that the additional capacity would add to the localization portfolio products that are not currently localized. In this sense, groups not previously in contact with localization would now need to become involved. For these cases, the internal staff would have to mediate for the smooth initiation of contact between the suppliers and these different internal groups.

### ***The staff***

The staff were supportive of the Outsourcing alternative, as long as no redundancies would be necessary. The shift in the required skill set would necessitate training, and change of career direction, both of which were seen as growth opportunities.

### ***The group manager***

The group manager was asked to review the recommendation and the assumptions on which the recommendation was based, and raised no issues.

## **Adjust model**

In order to accommodate the regional concerns about increased resource requirements, an additional top-level criterion was added, "Regional resource requirements" with a maximum rating of Critical (100), meaning that it was critical for the regional offices to not have to spend more time than they do now. The alternatives were assigned scores: Outsource: 0, Expand group: 0, No Change: 50, meaning that any alternative which increased the scope of work would be a low-performing alternative.

With these changes, the final scores would become:

- Outsource: 0.540, the best alternative 92% of the time
- No change: 0.485, the best alternative 6% of the time
- Expand group: 0.431

Sensitivity analysis here reveals a criticality of 8.6% for Regional resources, and the decision is still robust enough, because the score goes out of range before it can alter the recommended alternative.

It makes no sense to introduce both the Regional Requirements top-level criterion as well as change the Variable costs, because both measure the same thing. It is either the regional office or an external resource that would be responsible for the product review, but not both.

## Summary

The model seems to be valid, but raises the issue of the tradeoffs involved. The customers want the increased scope of localization, they want it to be completed faster, cheaply, but they have no resources allocate to reduce the costs.

The recommendation is robust enough to account for uncertainty, and a significant amount of variation in any of the weights assigned by any of the stakeholders.

## Discussion

### *Academic value*

The academic value of this work is in proposing a new decision model for outsourcing, the Double-loop SMART Framework, taking into account the relevant theories, but adding a double-loop learning step, where the model itself is evaluated and adjusted based on the recommendation it proposes. The model itself is flexible enough to be completely customized to the organization and the decision, and it provides an explicit list of criteria taken into account, and how important each criterion is to the decision. The same model can be used for evaluation technology alternatives, vendor selection (Akomode *et al.*, 1998), and even vendor performance management, with little modification.

Multiple alternatives can be added and evaluated, revealing the strengths and weaknesses of each, including tradeoffs. By using a software implementation of the model, the impact of uncertainty is more accessible, and sensitivity analysis can easily reveal any possible weakness of the decision.

### *Findings versus theory*

#### **Operational efficiency**

##### **Advantages**

Much of the literature focuses on operational efficiency benefits, with which the implementation of this model is in concordance. Out of the operational objectives, outsourcing would benefit Speed, Dependability, Flexibility, as well as Cost. Quality is not affected, because the quality control mechanisms can be applied irrespective of the alternative chosen.

The potential benefit from better documentation of the internal costs as a prerequisite to outsourcing are interesting, and could be used to recommend re-engineering instead of, or in addition to outsourcing.

##### **Disadvantages and Risks**

Up selling is to be expected, but it is not considered a risk. It is in fact a hope that competent suppliers will offer a more robust service portfolio, leveraging their capabilities and skills, as well as richer knowledge of the customer needs.

The risk on average quality is not necessarily there, but the risk of variation of quality is. Direct communication between suppliers and regional offices is not inherently more risky, but opens the opportunity for variation of quality depending on personality and conflicting priorities.

#### **Strategy**

The potential strategic benefits are relevant, because while there is no intent is to reduce headcount in pursuit of a leaner organization, the skill set of the staff will be elevated, externalizing the tedious day-to-day communications and file transfers. Free from project management, the staff can focus on running the business of localization, managing the network of relationships, investigating the potential of technology, and strategic partnerships.

However, if Strategy were removed from the model, the Outsourcing becomes an even better choice, with a score of 0.733 at 99% of the time. Essentially the Strategy criterion acts to reduce the value of the outsourcing decision, which is not surprising, considering it was added to the model to accommodate the risks of the outsourcing decision to the organization. In this sense, the outsourcing alternative is the recommended alternative despite the Strategy, rather than because of it.

This seems to indicate that Strategic factors have more of a risk rather than a contribution role, at least in this implementation. Both Reversibility, and Hollowing and Dependency seem to play a key role.

Dependency at renegotiation is not a problem likely to be faced by the organization, because the work is contracted on a unit basis. Because of technological and process developments in the industry, suppliers

maintain fixed rates for their customers for at least three years, and often up to five years or more. A reasonably mature industry is the best guarantee that suppliers keep a proper perspective when negotiating prices with their customers. Furthermore, the current model of using multiple vendors concurrently would act to reduce risk and add flexibility, while dependency would still be present.

### **Image**

Image has not been taken into account, except in the context of the impact of the new communication matrix, on the quality of service. Being a private company, the profit per head is very important rather than critical.

The potential lack of trust between the other internal groups and the supplier is a valid concern. Trust takes time to build, and in their new roles, the staff need to act as catalysts in the relationships. Otherwise, there is little to prevent the regional offices from starting to shop around locally for better prices, sacrificing the benefits of scope and scale, and consistency in quality from common standards and procedures across the localization portfolio.

### **Human resources**

Human resources play a key factor in both the decision process, as well as the implementation. The literature does not point to the growth opportunities as a result of the outsourcing decision. Outsourcing is generally seen in the literature as having a negative impact on the staff, but this does not need to be so, particularly if there are no redundancies. Alongside the outsourcing decision, there are great opportunities for career growth, as the new role of relationship management is clearly more senior than that of project management. However, there is also a clear risk of being unable to cope.

### ***Findings versus real life***

Use of this model is helpful because it provides a very accessible method of explaining the benefits of the decision to the stakeholders, including the impact of their choice of priorities.

#### ***Implications of increasing the localization capacity***

Validation of the model with the customers crystallizes the idea that they cannot have everything; they need to be aware of the tradeoffs. If the additional localization is required the additional product certification must follow. This will necessitate an external or internal resource, a tradeoff to the cost performance. This raises the question of the business case of the decision: is it really valid to only take into account the external cost of localization during project selection? If both internal and external costs were to be taken into account, making decisions on using an internal or external resource would be easier. In having to choose between an external reviewer and another internal group who would cross-charge the review work to the regional office, the customers might find it cheaper to hire someone explicitly for the purpose of product reviews. Even if not, the perception of the cost performance might be adjusted to take into account the real effort involved, external and internal. Alternately, faced with the real cost of localization, the customers might reduce the number of project requests, when both ROI and RI criteria would reveal that too many of the projects are of strategic rather than financial value. This does not mean that strategic investment would be eliminated; instead, the line between strategic and financial investment could move, and the strategic investment would then become more focused on the most critical products.

Furthermore, the 200 new projects needed to close the gap between the current capacity of 100 and the desired capacity of 300 projects, are very likely to have different characteristics; they will likely be less structured, with less mature technology, and generated and supported by groups not familiar with localization. As such, both ROI and RI are reduced, as the number of projects increases. Progressively more effort needs to be made for progressively less benefit.

#### ***Cost-benefit analysis***

Before a decision is made, it would be valuable to discover the full cost of localization, using a method that includes both external and internal costs, for example activity based costing. This can then be used to make intelligent decisions on who is responsible for each task, and why.

Headcount restrictions can be lifted if it becomes possible to demonstrate the cost advantage to top management. The whole localization model could even be changed, where the department could become a profit center instead of a cost center, free increase headcount within certain parameters of profitability.

The actual quantification of the benefits and risks are not shown in this model. While the relative weights of the criteria are clear, the actual costs could affect the weights assigned, and quantify the tradeoffs. What exactly is the tradeoff relationship between cost and speed? Projects can be completed sooner, if they are started sooner. However, starting sooner means working with preliminary source materials, which then necessitates rework. This increases the cost, and the overall work in completing each project, which reduces the total number of projects undertaken. In maximizing the cost performance, localization would start only once the English version is released, to ensure that updates are minimized. Clearly, this cannot happen for any project where time to market is critical. Furthermore, if problems are found in the source materials after the English product is released, it is much more difficult to resolve them, because the resources responsible for this work will have moved on to other projects.

A model or formula which would crystallize the relationship would be useful because it could be used in deciding the project start time, depending on whether the customers wanted a cheap project, a fast project, or anything in between. The latest calculation made for documentation projects pointed to the fact that a documentation project started with final source materials is 40% cheaper than if updates are needed. This kind of information needs to be validated with a bigger sample, and then proposed to the customers during project approval.

Costs associated with implementing each alternative are not considered. In the Expand group alternative, the fixed cost of salaries, benefits, and infrastructure is considered, but the periodic recruitment and training cost is not. In the Outsource alternative, there are setup costs in defining the communication matrices, training the current staff in the required new skills, and the costs of team-building and face-to-face interactions. These are semi-variable costs, linked to employee turnaround or time periods rather than project volumes.

### ***Re-engineering***

One major risk of outsourcing is that, once an activity is outsourced, effort to re-engineer the activity may stop, as the staff then needs to focus on the redefined internal activities. It is important therefore to maintain focus on re-engineering, which while more difficult when the activity is external to the organization, has significant potential benefits.

Even once the current bottlenecks of internal localization staff and review resources are removed, new bottlenecks may prevent the capacity from increasing further. Re-engineering may reveal where time is spent, and reshape the cost structure of the projects. Pareto analysis could facilitate the selection of areas for improvement.

In addition to localization vendors, one vendor may be selected as technology partner, to ensure that process improvement is top priority, rather than to be pursued at times when there is little other work. Such a technology partner could be selected from the current pool of vendors, or can be completely new. Using a current vendor would leverage the intimate knowledge the current vendors have of our technology, as long as the vendor can provide assurances that the production line will not be deprived of key resources for the potentially higher margin activity of process consulting and tools development.

### ***Risk of local negotiation***

Having worked with suppliers directly, the regional offices may want to abandon the suppliers selected centrally in favor of local suppliers, either because of failure or because of success of the arrangement. If the arrangement fails, it is easy to see why alternative solutions will be sought. Interestingly enough, if the arrangement is successful, local suppliers may still be sought for cost reasons, cultural reasons, or reasons of control. Local suppliers will be cheaper where national factors are leveraged, as well as when scope and scale factors are not as important, as are in smaller companies. Each regional office would normally be more interested in the cost and turnaround of the local products, than they would be in uniform quality across the product-language combinations.

It is expected that wherever scale and scope come into play, some activities, in this case projects may subsidize others, for example where technology or processes developed for one project are leveraged by another. This puts automatically some languages in a position of leverage. Local agreements would eliminate that leverage, at the cost of loss of corporate control of localization quality. Further, multi-lingual vendor can best leverage from language to language, only when the languages are localized concurrently. If

the regional offices do not follow common localization schedule, much of the benefit of using multi-lingual vendors is lost.

The potential interest in working with local suppliers does raise the issue at a more general level. Is the model of centralized localization optimal? It is true that it is the industry standard to centralize localization, but the benefit has not been qualified or quantified in our organization. It is just company policy.

Adding to the model a new top-level criterion "Risk of local negotiation" with a weight of 100 (Critical), and scores of 0 for Outsource, and 100 for the other two alternatives changes the recommendation from Outsource to Expand group, although it is not a robust recommendation, with a criticality of 2.5% on Local negotiation risk, 3.9% on Strategy, 4.1% on HR, and 5.3% on Cost. In practice, a decision should never be made with criticality less than 5%, particularly with so many critical factors; the model is simply too volatile. However, the scores are presented here to demonstrate the point:

- Expand Group: 0.569, best alternative 55% of the time
- Outsource: 0.540, best alternative 16% of the time
- No change: 0.554, best alternative 22% of the time

Outsource becomes the recommended alternative again when the weight of the new criterion is reduced to 75 (Very Important), but is the recommended alternative for only 46% of the time. More conservative scenario could be to assign 75 to the Local Negotiation, and a score of 75 to the two alternatives other than outsource, as there is already a risk of Local Negotiation. This would result in:

- Outsource: 0.559, best alternative 71% of the time
- Expand Group: 0.527, best alternative 21% of the time
- No change: 0.511

The result is not robust, with a criticality of 3.7% on Local Negotiations.

## Recommendations

### For the company

While the recommendation to outsource is robust, it is worth noting that the score of each alternative is a measure against the perfect alternative, which has a score of 1. This means that the further away the score of each alternative is from the perfect score, the more imperfect is the chosen alternative. It is therefore recommended that some issues be addressed, before the decision is actually made:

- What are the project selection criteria, when these are based on ROI, RI? What is the anticipated cost benefit?
- Who will review the additional products? Who will pay for the review if external?
- Value of service: What is the tradeoff between cost and speed? What is the actual value of time to market?
- How to protect from local deals? Is policy enough?

### ***Project selection criteria – Cost-benefit analysis***

Full cost-benefit analysis should be undertaken, to quantify the internal as well as external costs, in addition to the benefits, current and potential. Some projects will be selected for strategic reasons; whether the reasons as financial or strategic should be made clear at project selection.

### ***Review resources***

The people or companies used for the reviews should be identified in advance. If internal resources are used, they should be involved in the outsourcing decision process. Whether internal or external, the cost associated with the reviews should be taken into account for both the sourcing decision as well as the project selection.

### ***Value of service***

The tradeoffs should be quantified where possible. This can simplify decisions and project prioritizations, as composite scores can enhance the understanding of the benefits. Since both faster turnaround as well as cheaper localization is desirable, what is the monetary value of releasing a product one week earlier?

### ***Self-competition***

The changes made must be crystallized, and protected from competing with local suppliers, as this would sacrifice many of the scale and scope benefits, increasing the number of vendors, and therefore increasing the cost of supporting them as a result. External costs saved by a regional office, could easily be shifted elsewhere, whether to an internal group or to another supplier.

### ***Recommendation summary***

Outsourcing can increase the capacity as defined by the goal. However, this decision must not be undertaken before the above questions are addressed. If undertaken, two suppliers should be used in parallel, to mitigate risk, while minimizing the management effort.

### Self-criticism

#### ***Goal defined as given***

The goal was defined as “increasing capacity”. However, the essence of this goal is to increase the profit of the regional offices, through product scope and volume. This is one of many possible ways of increasing profitability. Rationalization of project selection criteria may be another, as this could re-focus current efforts. Increased process efficiencies could be another. Simply managing expectations could increase customer satisfaction. Indeed there is no indication that our organization is under performing when compared to the industry, and we could be in fact be better than average. Benchmarking could help clarify if the core need is for increased performance or management of expectations.

#### ***Hybrid solutions***

One possibility not investigated is a hybrid solution. For example, the Outsourcing and Expand Group alternatives are not necessarily mutually exclusive. One possible solution would be to both increase group

size, as well as outsource more aggressively. The line between the functions to outsource and the functions to keep is arbitrarily defined here, with the intent of outsourcing as much as possible. It is assumed that if outsourcing is chosen it should be maximized, but this is not proven.

Another solution could be to just redefine the communication matrix, putting some people in direct contact. This would allow for the skills to be maintained, but could release staff resources to pursue re-engineering. This is essentially a hybrid No Change – Outsource solution.

Indeed, the line has been drawn between functions to keep and functions to outsource, but there is no estimate of the man-hours needed for the tasks kept in-house. Maybe there is not enough work for three, and then the choice will be either for redundancy, or for moving the line between tasks to keep and tasks to outsource. But moving the line at arbitrary position may inhibit the arrangement from working efficiently; the economies of scale and scope may not be achieved if selective tasks are removed from the suppliers, and the relationships between the suppliers and the other internal groups cannot properly develop if there is continual interference by the localization staff.

Because the additional localization is likely to be more complicated, one possibility could be to outsource the more mature products, and retain the ones that are less structured. This poses the question of whether this would jeopardize the relationship development between the suppliers and the other internal groups, as invariably there would be some comparison of efficiencies between the two categories of projects.

### ***Re-engineering***

While it is estimated that re-engineering could not yield dramatic improvements in the future as it has in the past, this is only an educated guess. It is true that with most of the work now in translation rather than engineering and testing, there is less space for automation than before. However, new processes and new technologies could radically change the cost structures and work volumes resulting in improvements that, while not as dramatic, are significant enough. Combined with avoidance of the risks of dependency and reversibility, this could be an attractive alternative.

### ***Post-agreement management***

While it is mentioned that management of the outsourcing agreement is key to its success, the methodology implemented to this management is not sufficiently developed. What quality measures would be used? What constitutes acceptable performance? What process would be followed when standards are not met? How would lack of regional responsiveness be resolved? Any of these questions could make the implementation of the decision succeed or fail; yet they are not developed to any great degree.

### ***No guarantee of success***

The risk of failure is not taken into account in the model. While attention is correctly focused on the need to facilitate the development of trust between the suppliers and the other internal groups, there is no explanation of how this will happen, and more importantly no guarantee that it will succeed. Failure to achieve smooth working relationships between the suppliers and the internal groups is virtually guaranteed to cause the outsourcing arrangement to fail.

It is acknowledged that different skills are required to manage the relationships than to manager the projects, and the need for training is correctly identified. However, there is no guarantee that the relationships will be correctly managed.

## Conclusions

Outsourcing, if managed properly, can increase operational efficiencies, with acceptable risks to strategic flexibility and human resource development.

Keys to its success is the development of an appropriate set of criteria, taking into account the current and future stakeholders of localization, the commitment from these groups, and the proper management.

Two risks which need to be taken into account before outsourcing are the risk of regional offices engaging in local agreements, and the risk of losing the opportunity to re-engineer, once outsourcing has been implemented.

One area which needs to be clarified is the extent to which outsourcing is the only way of achieving the corporate goals. While outsourcing can increase the sales revenue and the residual income from localization, the full tradeoffs to this increase need to be taken into account. These include the increased requirements for product certification resources, whether internal or external, and the direct monetary tradeoffs of key performance variables, such as speed and cost.

Once internal and external costs are taken into account, the incremental benefit of the increased capacity can better be evaluated. If outsourcing is still the recommended alternative to contributing to the corporate goals, then it is the decision that should be taken, and it should be given proper management attention and focus.

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## Appendices

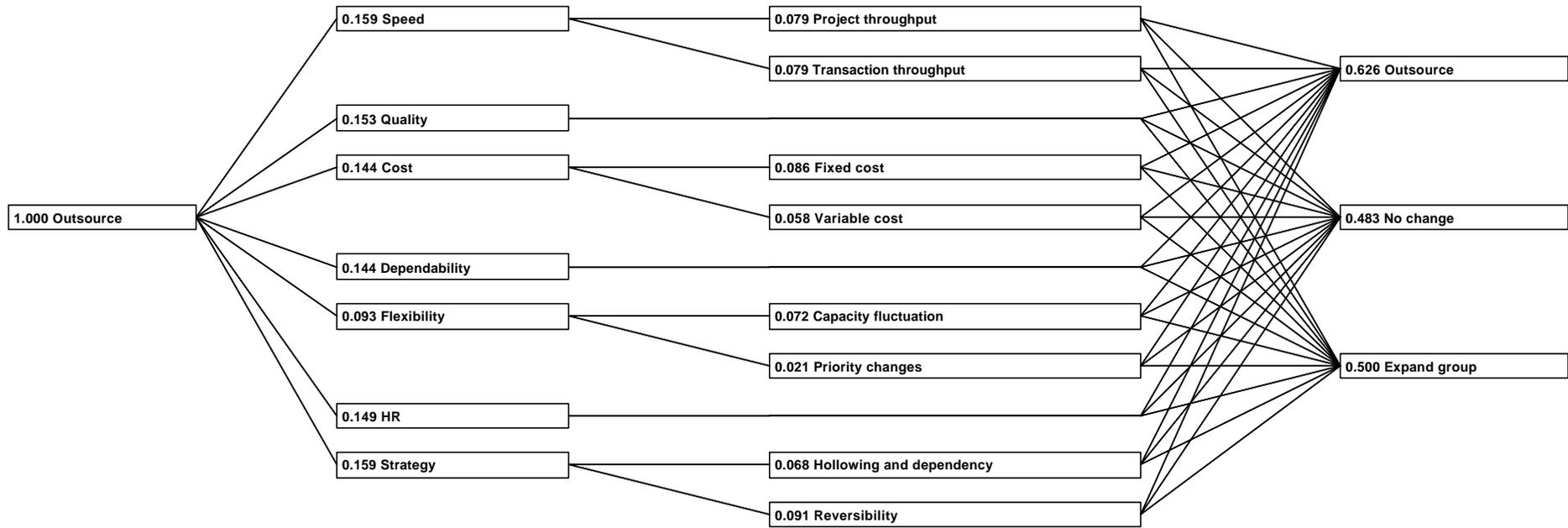
- Appendix A: Decision Data
- Appendix B: Decision Scores
- Appendix C: Contribution of Criteria
- Appendix D: Uncertainty in Decision Scores
- Appendix E: Decision Scores, including Uncertainty
- Appendix F: Speed: Contribution of sub-criteria
- Appendix G: Cost: Contribution of sub-criteria
- Appendix H: Flexibility: Contribution of sub-criteria
- Appendix I: Strategy: Contribution of sub-criteria
- Appendix J: Uncertainties in the No Change alternative
- Appendix K: Uncertainties in the Outsourcing alternative
- Appendix L: Uncertainties in the Expand Group alternative
- Appendix M: Sensitivity Analysis
- Appendix N: Uncertainty Curves
- Appendix O: Customer Satisfaction Questionnaire

Appendix A: Outsourcing Decision Data

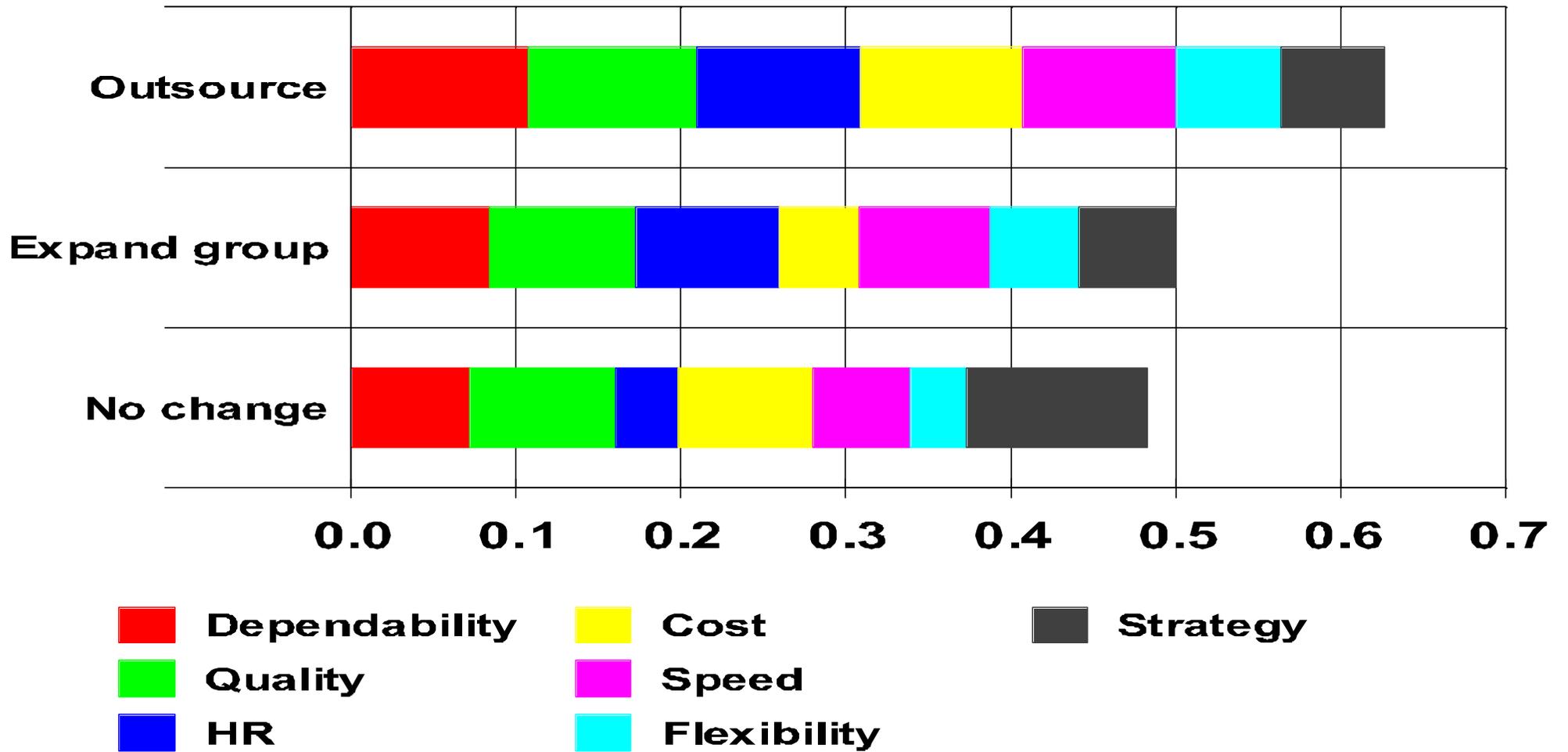
Goal	Weights	Priorities	Criteria	Weights	Priorities	Sub-criteria	Outsource		No Change		Expand group	
							Weight	Priority	Weight	Priority	Weight	Priority
Outsourcing Decision	99.6	0.159	Speed	100	0.500	Project throughput	66.67	0.667	25	0.250	66.67	0.667
				100	0.500	Transaction throughput	50	0.500	50	0.500	33.33	0.333
	95.8	0.153	Quality			Quality	66.67	0.865	58.33	0.813	58.33	0.813
	90.3	0.144	Cost	75	0.600	Fixed cost	75	0.750	50	0.500	16.67	0.167
				50	0.400	Variable cost	58.33	0.583	66.67	0.667	58.33	0.583
	90.3	0.144	Dependability			Dependability	75	0.908	50	0.750	58.33	0.813
	58.3	0.093	Flexibility	58.3	0.777	Capacity fluctuation	66.67	0.667	25	0.250	58.33	0.583
				16.7	0.223	Priority changes	75	0.750	75	0.750	58.33	0.583
	93.8	0.149	HR			HR	66.67	0.667	25	0.250	58.33	0.583
	100	0.159	Strategy	75	0.429	Hollowing and dependency	25	0.250	50	0.500	75	0.750
				100	0.571	Reversibility	50	0.500	83.33	0.833	8.33	0.083

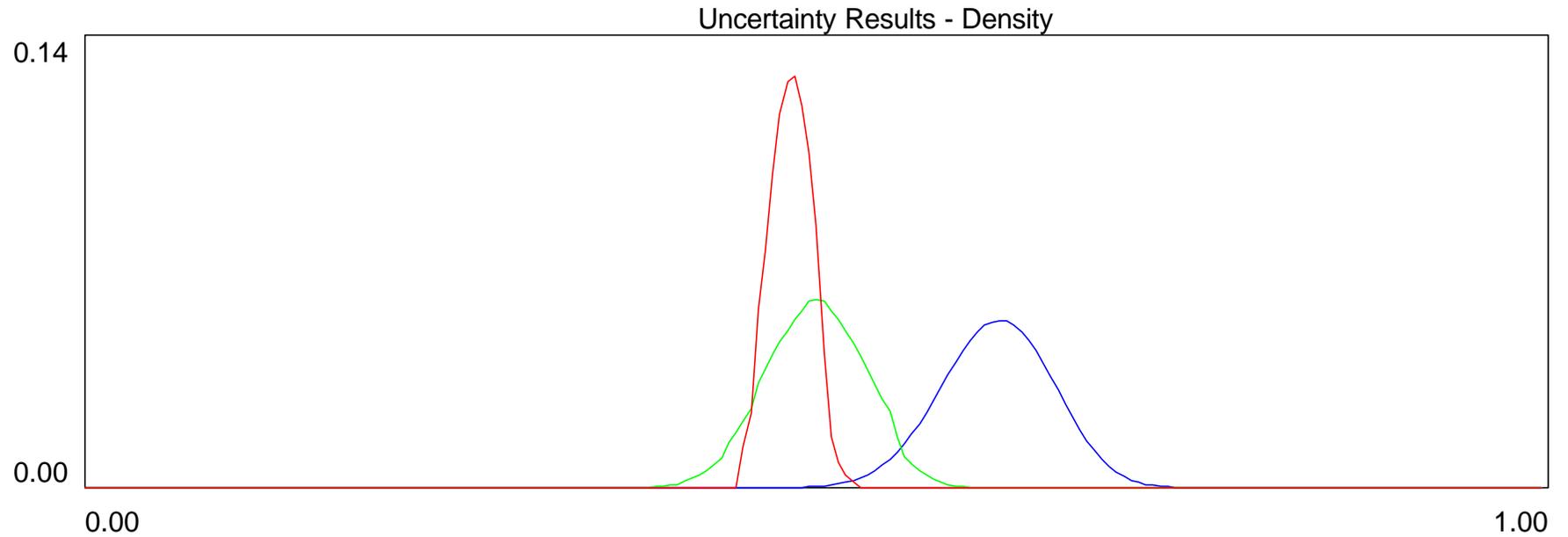
Appendix B: Decision scores

Outsourcing



### Contributions to Outsource from Level:Criteria

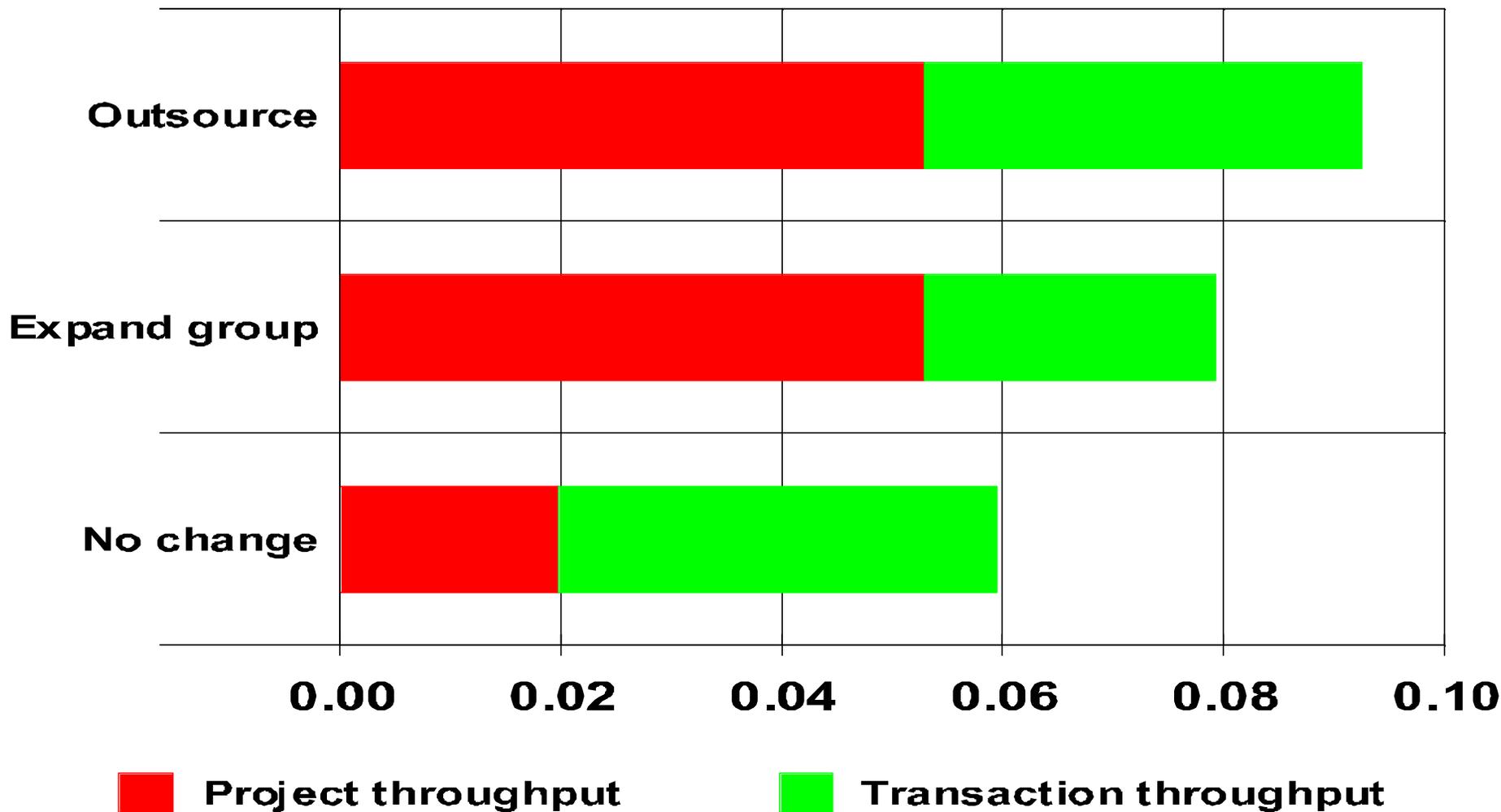




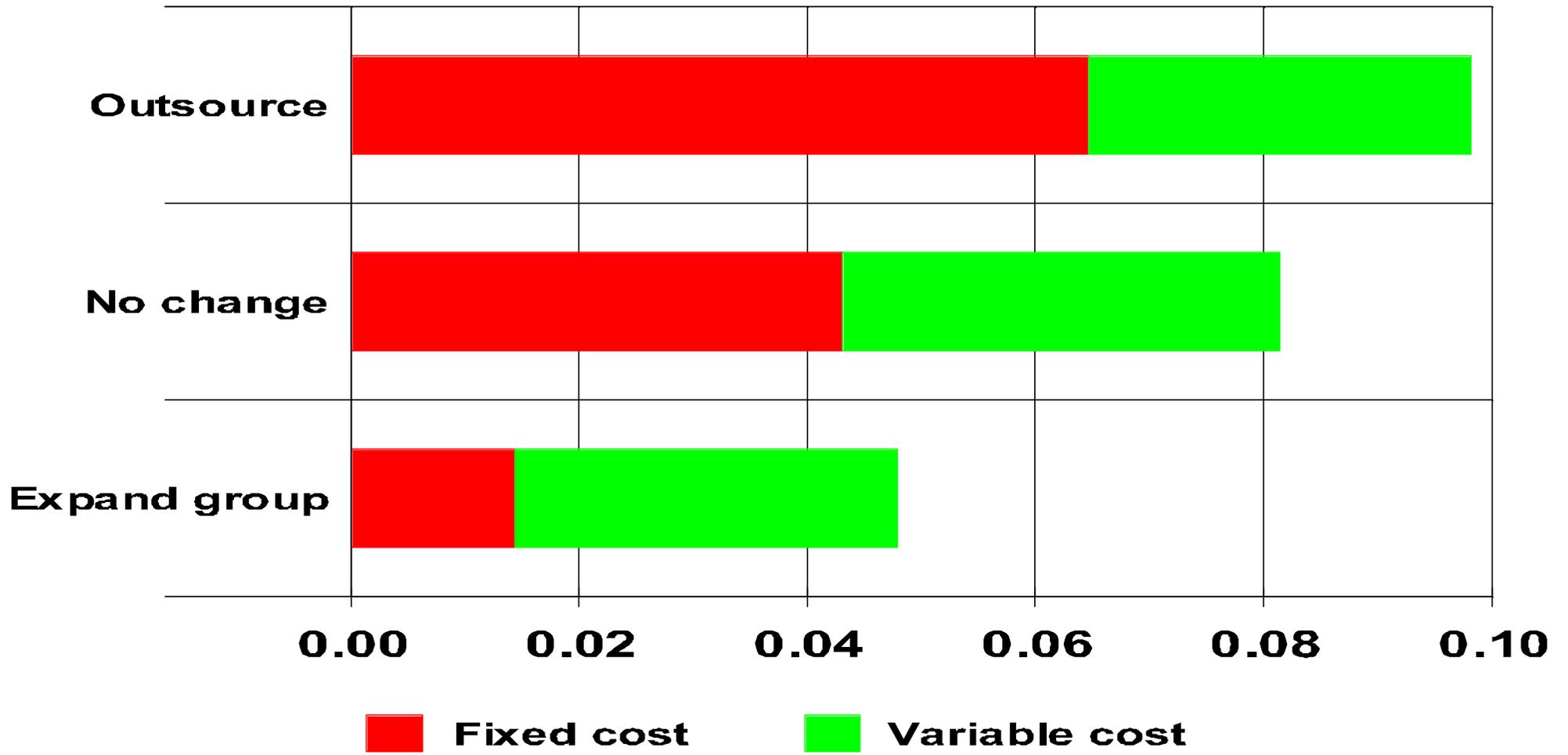
Alternatives	Score	Mean	Line
Outsource	0.63	0.62	<span style="color: blue;">—</span>
Expand group	0.50	0.50	<span style="color: green;">—</span>
No change	0.48	0.48	<span style="color: red;">—</span>

Alternatives	Value	% values show the percent of time the alternative is better than all others
Outsource	0.626	
No change	0.483	
Expand group	0.500	

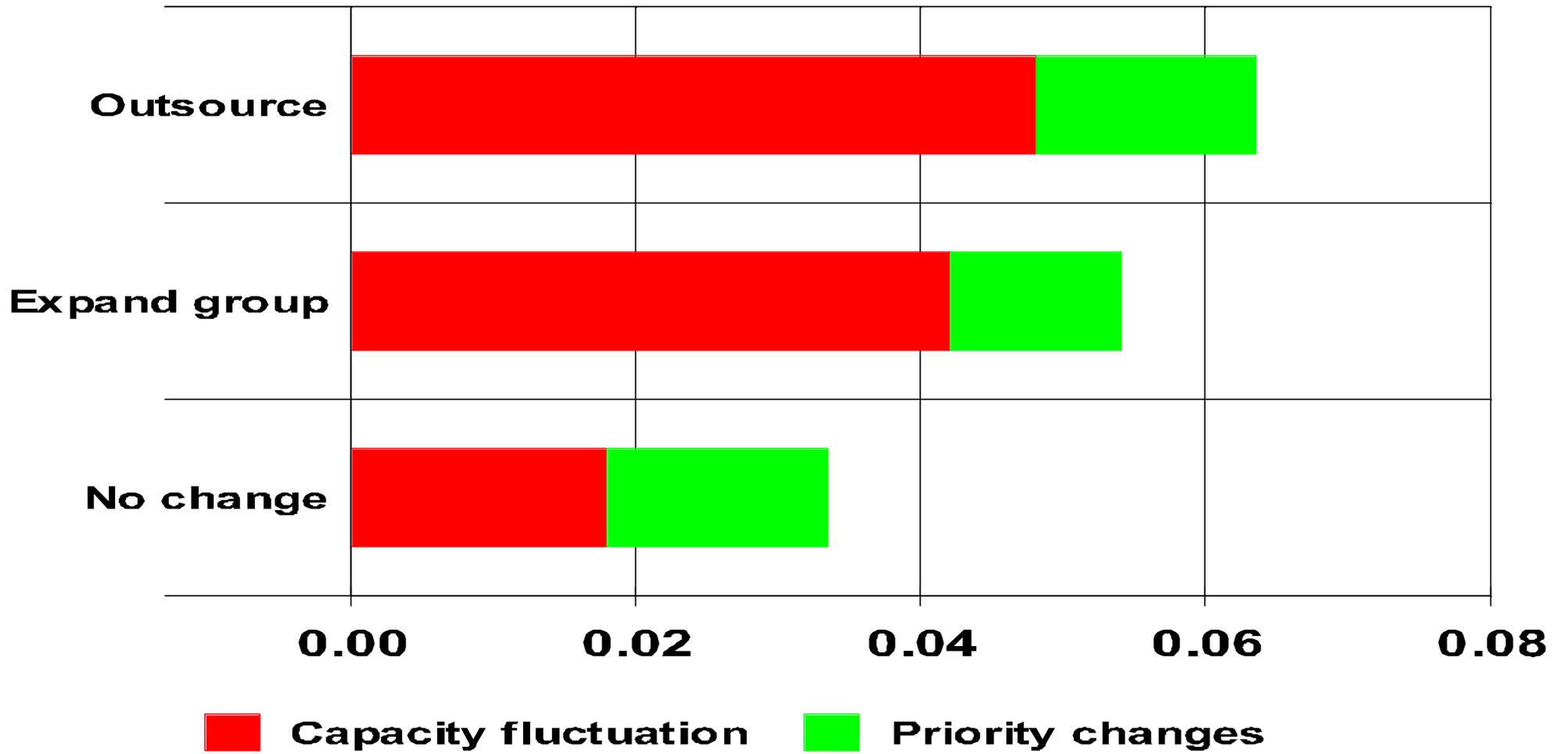
### Contributions to Speed from Level:Sub-Criteria



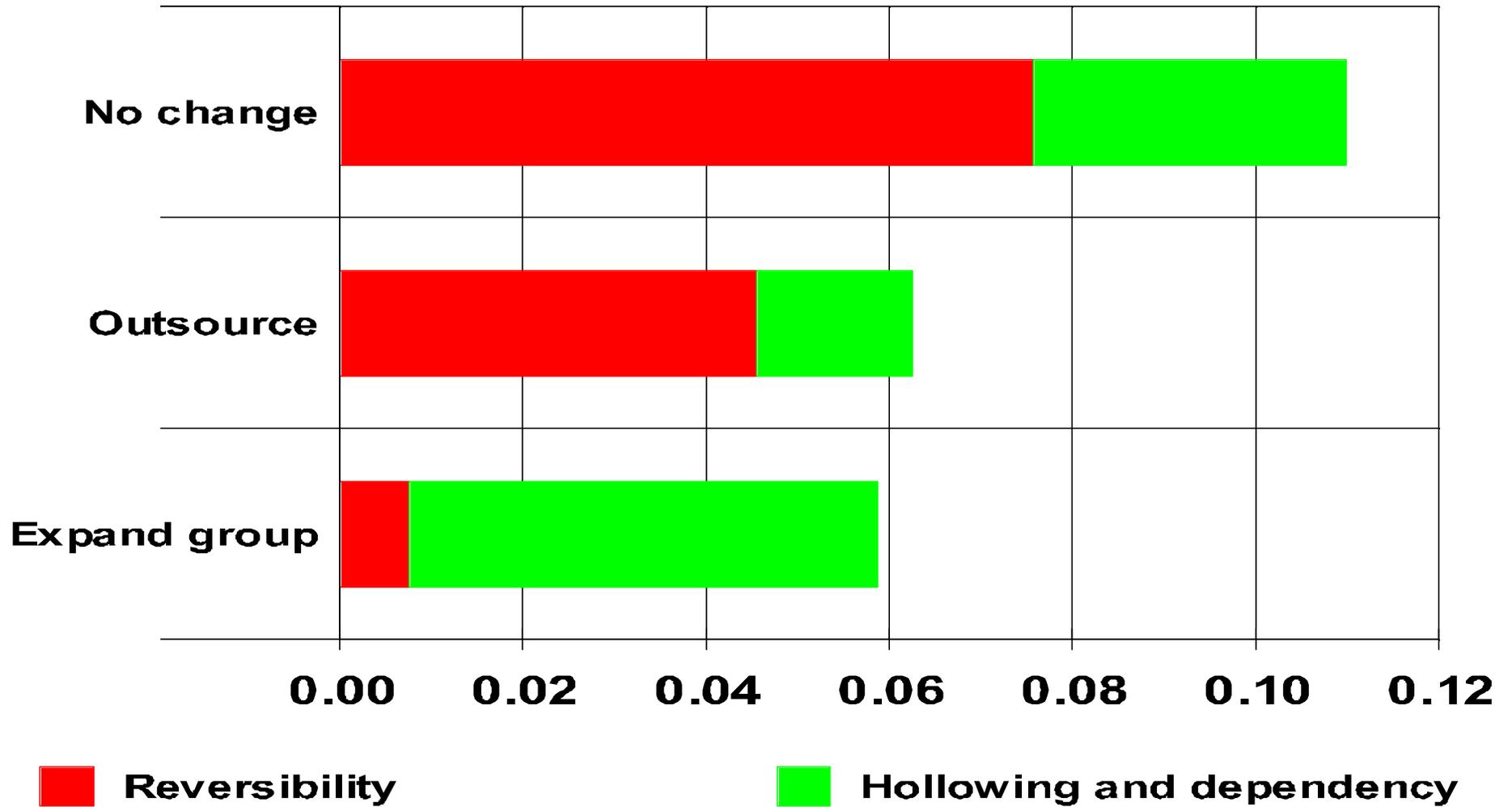
### Contributions to Cost from Level:Sub-Criteria



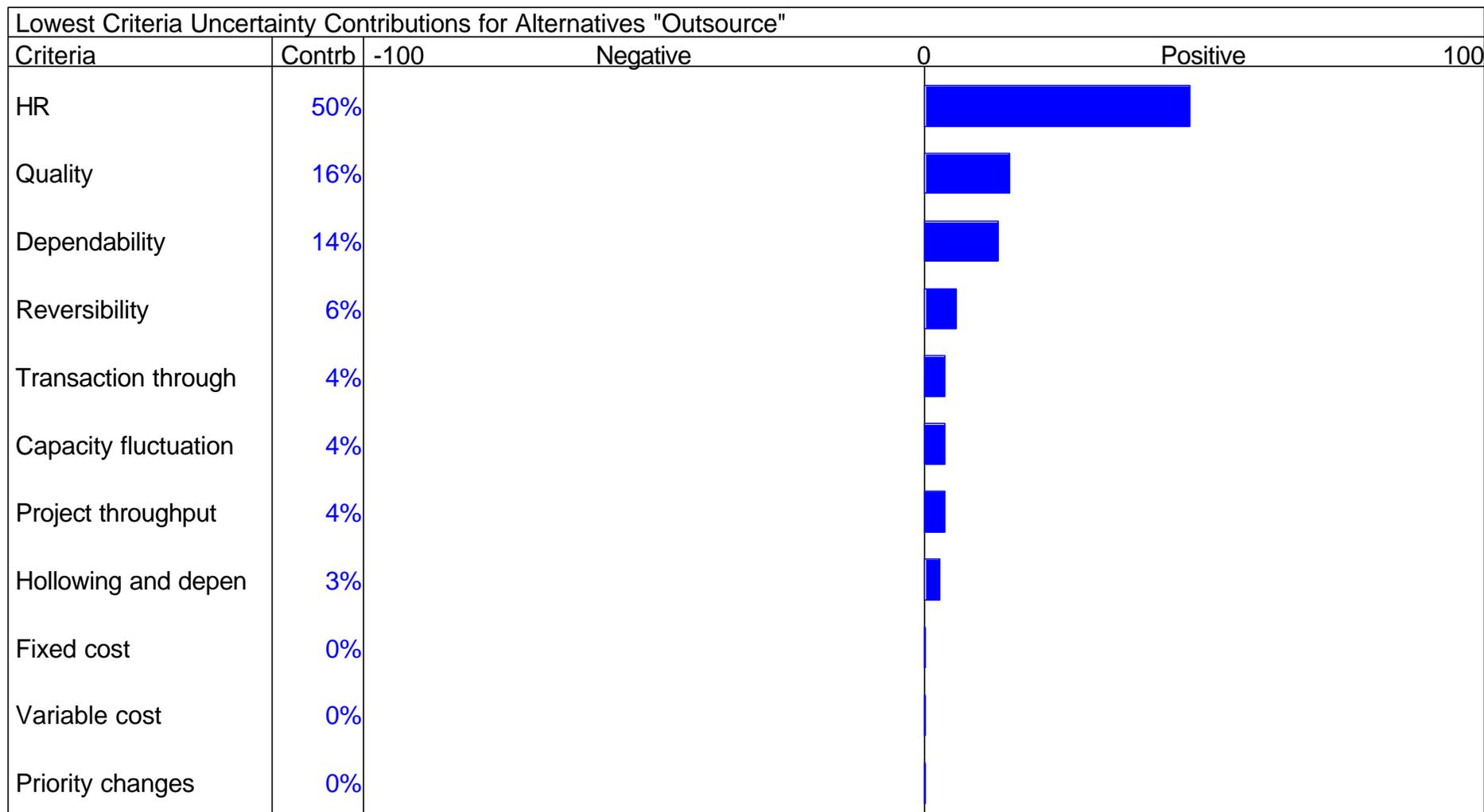
### Contributions to Flexibility from Level:Sub-Criteria

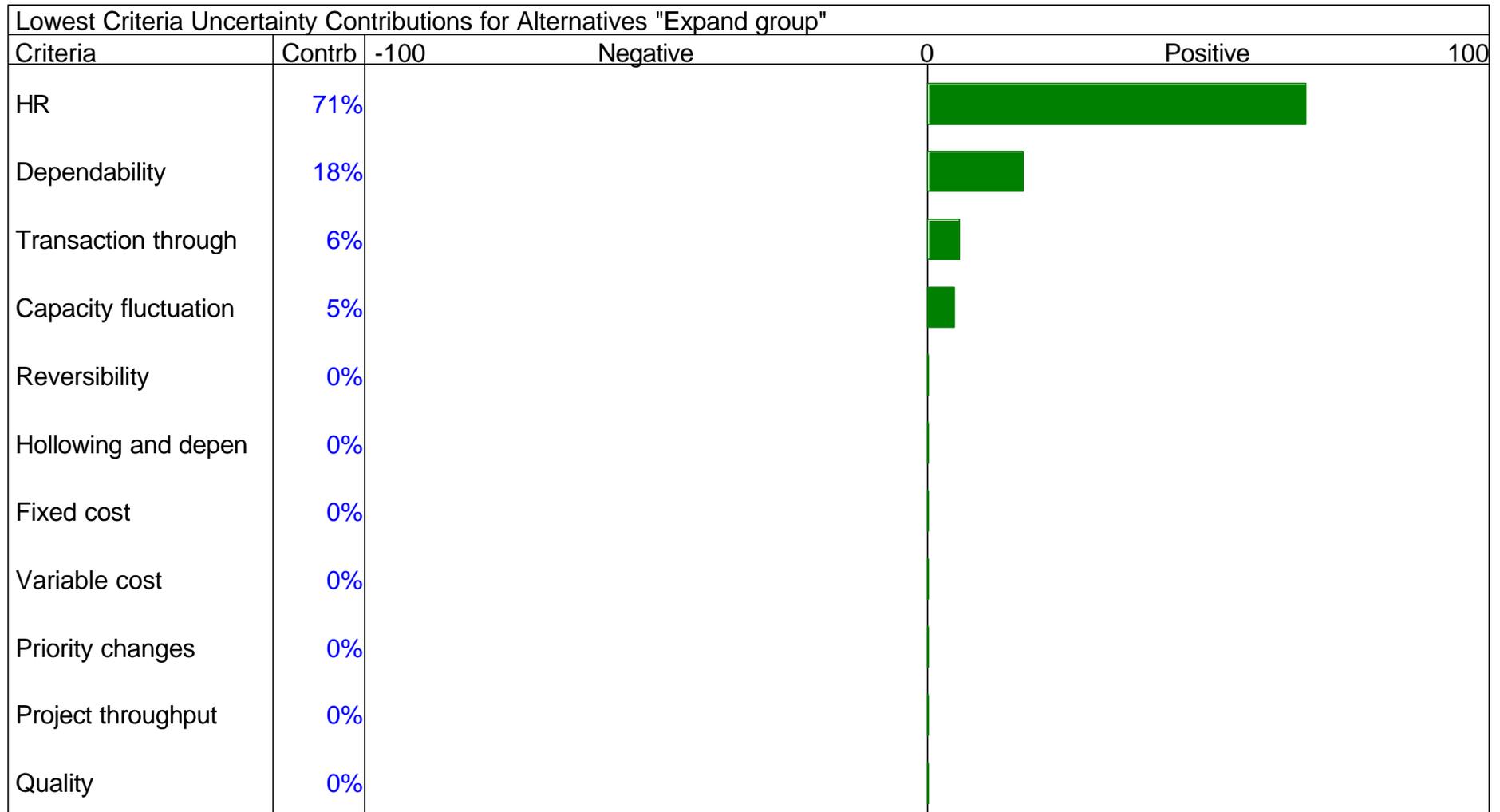


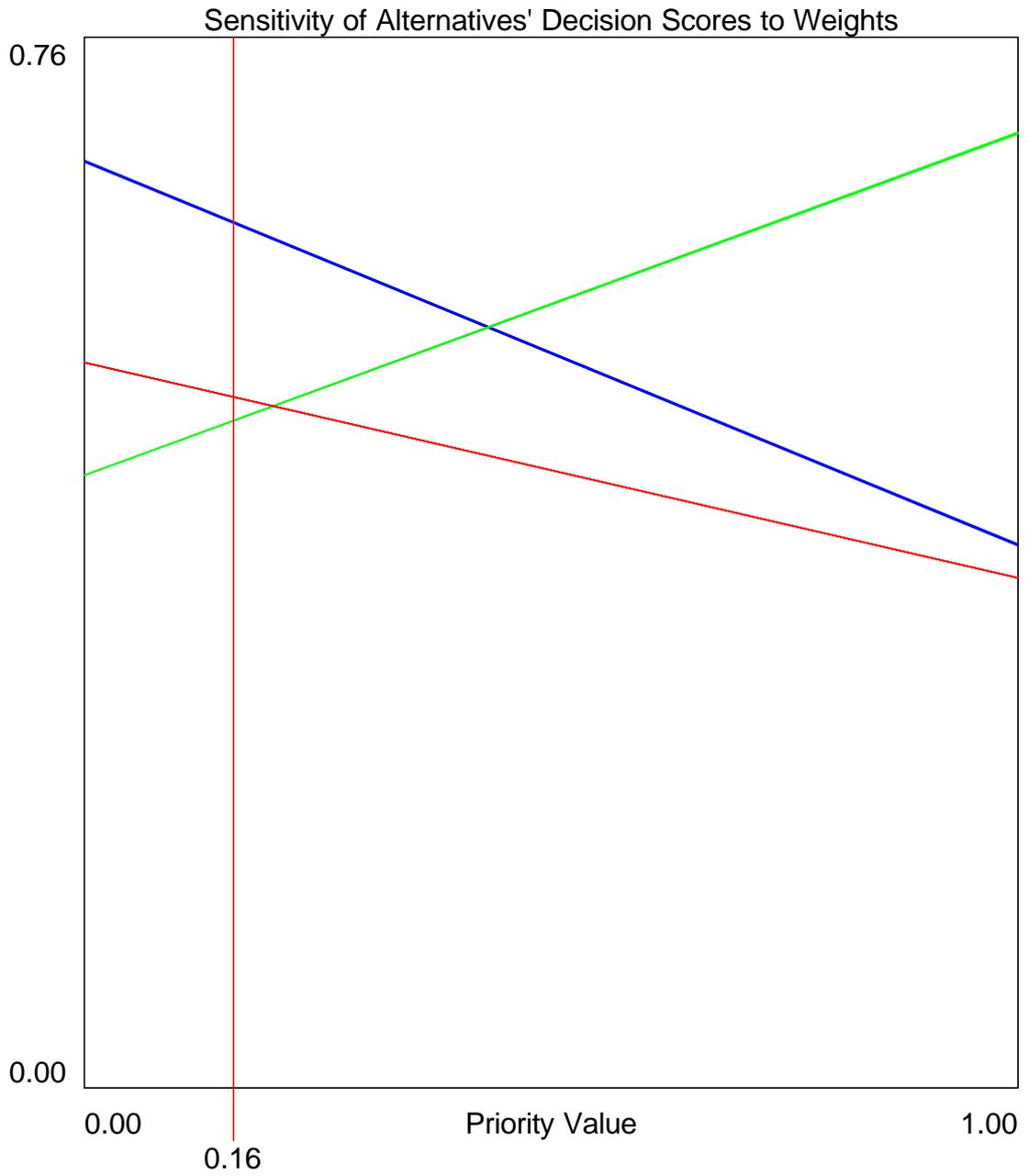
### Contributions to Strategy from Level:Sub-Criteria



Lowest Criteria Uncertainty Contributions for Alternatives "No change"						
Criteria	Contrib	-100	Negative	0	Positive	100
HR	100%					
Reversibility	0%					
Hollowing and depe	0%					
Fixed cost	0%					
Variable cost	0%					
Transaction through	0%					
Dependability	0%					
Priority changes	0%					
Capacity fluctuation	0%					
Project throughput	0%					
Quality	0%					





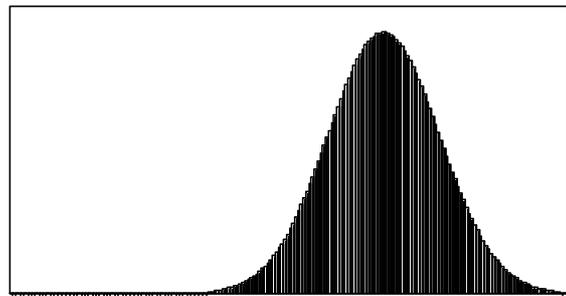


The current weight is that of :  
 "Strategy" with respect to "Outsource".  
 The current priority is 0.16(Critical), with criticality 27.3%.

Uncertainty Assumptions by Attribute

**Uncertainty in: Project throughput  
For: Outsource**

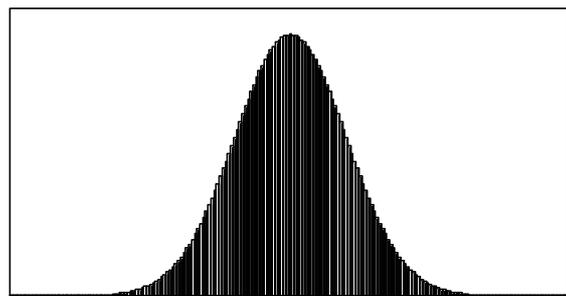
Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 66.67  
 Maximum: 100.00  
 Std. Deviation: 10.00



0.00 Default 100.00

**Uncertainty in: Transaction throughput  
For: Outsource**

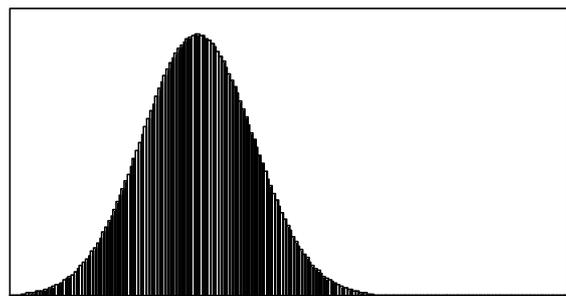
Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 50.00  
 Maximum: 100.00  
 Std. Deviation: 10.00



0.00 Default 100.00

**Uncertainty in: Transaction throughput  
For: Expand group**

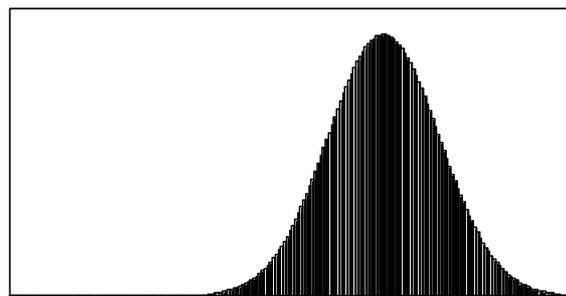
Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 33.33  
 Maximum: 100.00  
 Std. Deviation: 10.00



0.00 Default 100.00

**Uncertainty in: Quality  
For: Outsource**

Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 66.67  
 Maximum: 100.00  
 Std. Deviation: 10.00

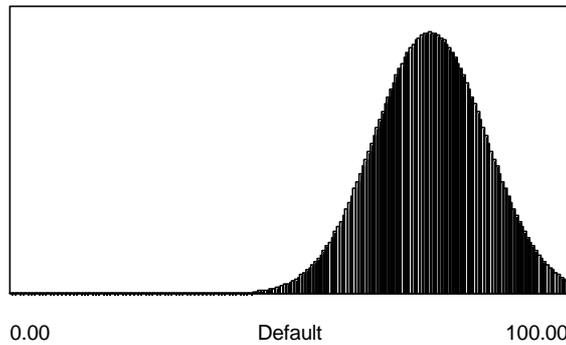


0.00 Default 100.00

Uncertainty Assumptions by Attribute

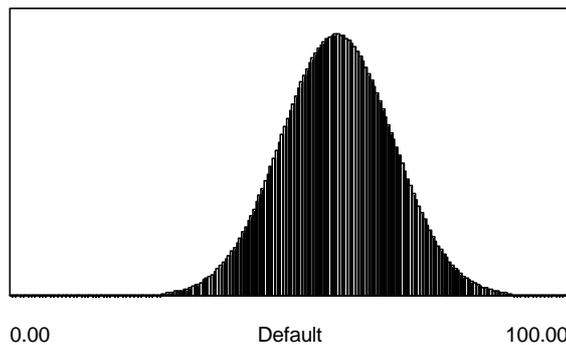
**Uncertainty in: Dependability  
For: Outsource**

Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 75.00  
 Maximum: 100.00  
 Std. Deviation: 10.00



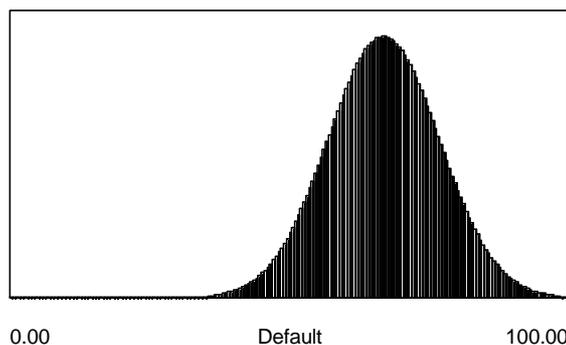
**Uncertainty in: Dependability  
For: Expand group**

Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 58.33  
 Maximum: 100.00  
 Std. Deviation: 10.00



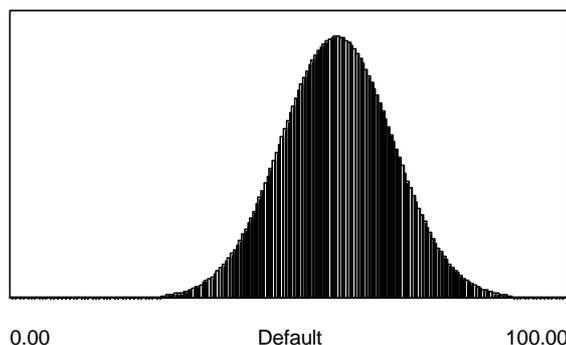
**Uncertainty in: Capacity fluctuation  
For: Outsource**

Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 66.67  
 Maximum: 100.00  
 Std. Deviation: 10.00



**Uncertainty in: Capacity fluctuation  
For: Expand group**

Normal distribution with parameters:  
 Minimum: 0.00  
 Likeliest: 58.33  
 Maximum: 100.00  
 Std. Deviation: 10.00







## Appendix O: Customer Satisfaction Questionnaire

### Customer care questionnaire

Date 01-02-02

RO Contact (fill your name here)

Attributes	Importance to you	Notes
Quality	Important ▼	
Speed	Important ▼	
Scope	Important ▼	
Communications	Important ▼	
Cost	Important ▼	

Importance
Critical
Very important
Important
Unimportant
Trivial

Attributes	Sub-attributes	Importance	Performance	Perceived Change	Notes
Quality	Terminology	Important ▼	Average ▼	Unchanged ▼	
	Style	Important ▼	Average ▼	Unchanged ▼	
	GUI Aesthetics	Important ▼	Average ▼	Unchanged ▼	
Speed	Software	Important ▼	Average ▼	Unchanged ▼	
	Documentation	Important ▼	Average ▼	Unchanged ▼	
Scope	Enough products	Important ▼	Average ▼	Unchanged ▼	
	Enough Documentation	Important ▼	Average ▼	Unchanged ▼	
	Enough updates	Important ▼	Average ▼	Unchanged ▼	
Communications	Know who to contact	Important ▼	Average ▼	Unchanged ▼	
	PM responsiveness	Important ▼	Average ▼	Unchanged ▼	
	PM quality of communication	Important ▼	Average ▼	Unchanged ▼	
	PM courtesy	Important ▼	Average ▼	Unchanged ▼	
Cost	Cost of localization (External)	Important ▼	Average ▼	Unchanged ▼	
	Cost of localization (Internal)	Important ▼	Average ▼	Unchanged ▼	

Performance
Excellent
Above average
Average
Below average
Poor

Perceived change
Improving dramatically
Improving
Unchanged
Deteriorating
Deteriorating dramatically