Emerging Trends in Information Technology Departments of Major Icelandic Corporations

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Abstract

A review of CIOs representing 11 large corporations (by Icelandic standards) in seven industries yielded a set of trends that have emerged as representative of current Icelandic computer-based initiatives. Among these trends: a desire to reduce labor costs is not the primary reason for outsourcing; project management and requirements determination skills are in need; the establishment of IT strategy is typically not driven by the board of directors; while establishing systems that satisfy international standards is sought by most companies, none are eager to pursue certification; outsourcing is generally restricted to the fewest possible time zones; the most commonly used country for outsourcing is the Baltic nations and India; several attempts to utilize Russian companies failed, usually due to a lack of communication skills on the part of the Russians; IT departments utilize outsourcing to secure sophisticated skills for one-time tasks, thereby permitting the company to maintain small IT staffs. Industry seeks business school graduates who can contribute IT strategy in the board room, create effective requirements documents, and possess a vision with respect to the application of technology to the competitive nature of business.

Keywords: Outsourcing, IT functions, Iceland, emerging trends

Introduction and Motivation for the Study

The discussion of offshoring and the consequent effect on jobs has become a popular research thread, especially with respect to those countries that appear to be the source of the jobs being outsourced (Asprey, et. al, 2006). Other kinds of outsourcing research endeavours include relationships between outsourcers and vendors (Grossman and Helpman, 2005) and risks associated with outsourced projects from the vendor's perspective (Taylor, 2006). In none of these articles was there any reference to small countries and the role of the outsourcing of IT functions.

The authors of this paper sought to study the effect of outsourcing on Icelandic industry largely because no such study had ever been undertaken and having a benchmark study would be important as Iceland continued its impressive industrialization record. We performed a diligent survey of all business literature in the National Library of Iceland searching for research articles on the state of outsourcing. None were located. An investigation of all articles dealing with technology, technological change, or computers in Icelandic business yielded very few useful articles. One article dealt with productivity and technological change within the context of cost functions (Institute of Economic Studies, 2003), another with technological strategies with respect to retail banks (Gunnarsdottir, 1999), a third addressed productivity in business (Hertsson, 1993), a fourth discussed technology in society (Jonsson and Hujibens, 2005), a sixth was a proposal for action to utilize technology (Federation of Icelandic Industries, 2005), another addressed the competitive advantage of high-income nations built on technology (Þorgeirsson, 2004), and the last was the annual Nordic Information Society Statistics (2005), a compendium of articles, tables and graphs on information and communications technology.

While this last reference was the most promising, it only identified Swedish and Finnish enterprises as participating in outsourcing. In short, the available information on outsourcing in Iceland was nonexistent. The authors saw the emergence of an unfortunate pattern.

Icelandic Background Information

Iceland, with a population of 300,000, enjoys one of the highest standards of living in the world with a 2005 estimated GDP per capita of 55,000 USD. This high standard is supported by a very high labour participation rate and by renewable natural sources. High economic growth and rising productivity owe much to a flexible labour market, and extensive reforms in the fields of regulation and competition since the early 1990s. These have encouraged a more business friendly environment that has nurtured entrepreneurial spirit despite the small domestic market. Iceland's membership in the European Free Trade Association (EFTA) and the European Environment Agency (EEA) has ensured a largely unfettered access to European markets.

Iceland is the World's fifth most successful economy in exploiting developments in information and communications technology according to the World Economic Forum (2006). At the beginning of 2000, the balance sheets of the largest Icelandic corporations consisted mostly of domestic assets. The dramatic surge in the corporate balance sheet with total assets quintupled over the past three to four years (see figure 1) has been largely due to overseas expansion, mostly through acquisitions. Given the small size of the Icelandic market, Iceland's largest corporations have focused on expanding their activities outside of the country.

This development is in large part due to early adoption of information and communications technology (ICT) and the successful utilization of its potential. Icelandic businesses, government institutions and households were among the earliest in the world, along with some other Nordic countries, to adopt information technology (Nordic Information Statistics 2005). About 98% of Icelandic business and households are connected to the internet with broadband use approximating 80%. According to the World Economic Forum (2006), Iceland ranked in 5th place in networked readiness in 2005 and 2nd in 2004, rising from 10th place in 2003. Iceland also scores high on other important IT measures such as business usage where it ranks 7th (Global Technology Report 2005-2006).

Evidence of Iceland's early adoption of internet technology is illustrated by Islandsbanki (re-branded as Glitnir in 2006), Iceland's first bank to introduce electronic banking through a dial-up connection in 1988. While mainly aimed at corporate customers the service was also open to regular customers. As customers dialled up and connected to the banks modem service they were greeted by a text interface similar to early BBS services that enabled them to do simple transfers between their own accounts and limited ability to pay selected bills. The system was written and developed by Islandsbanki and although home computers were still not a household item, the use of the service grew steadily. Later when graphical display of html code was introduced, Islandsbanki moved the electronic banking services to the internet in 1996 (private verbal correspondence from an individual who performed the above task, 2007). Islandskanki was among the first in the world (Telecoms Infotechnology Forum, 1999) to offer "true" internet services. Soon other Icelandic banks followed suit. By 2002, two thirds of Iceland's household owned a desktop computer and internet banking had entered as the mainstream way of doing banking (Statistics Iceland, 2006) both for businesses and household. True internet banks are defined as those that permit their customers to review balances, transfer funds and pay bills on their web sites (TIF, 1999).

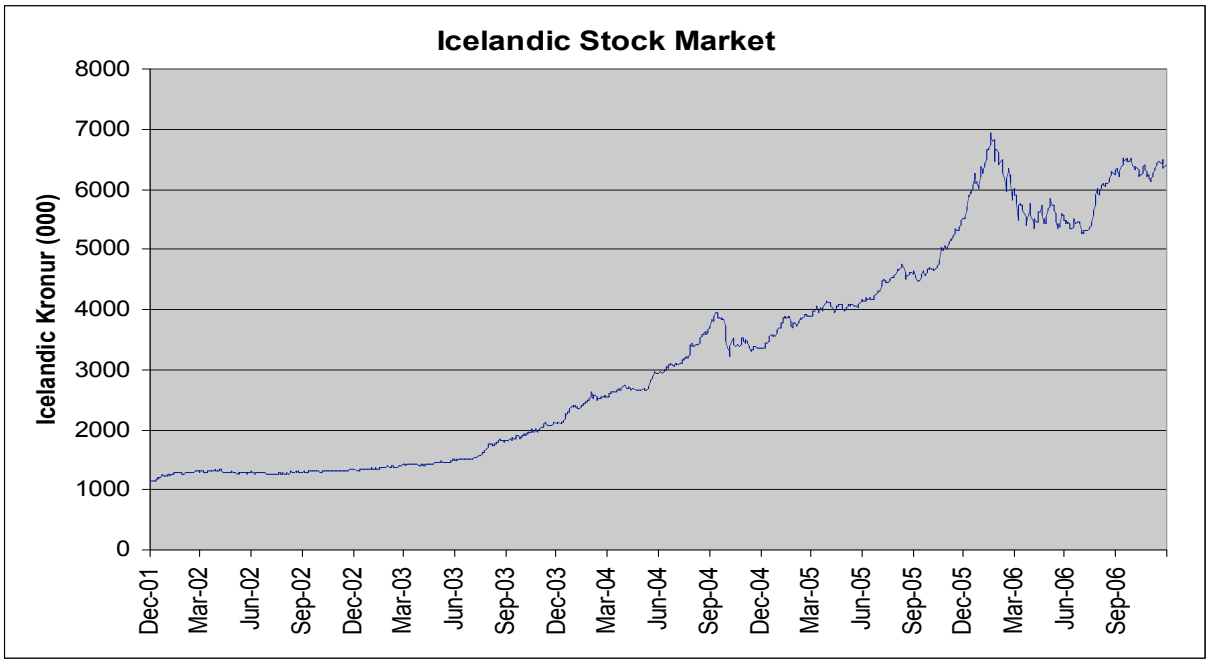

Figure 1. Source: Icelandic Stock Exchange

One other aspect of outsourcing that is not sufficiently addressed is that of the role of terrorism (Gibson, 2006). This was brought to the attention of the outsourcing community on 11 July 2006 by terrorist bombings in Mumbia, India, a key outsourcing locale. The concern for disaster recovery of offshore service providers became a more important component in the strategy of the outsourcer regardless of the home country of that outsourcer or its history of terrorist activities. Terrorism is not a critical theme in Iceland and is thus not addressed in this paper. Much has been written about the reasons for outsourcing, selection of vendors, and what constitutes successful outsourcing. The Outsourcing Institute (2007) has compiled lists that make perusal relatively painless, but unfortunately, little more than lists are offered. Nevertheless, our research suggests these lists are applicable to Icelandic industries.

Purpose of Study

National and multinational companies across the globe now engage in some kind of outsourcing venture, and the variety of kinds of business functions being outsourced continues to grow. Eli Lilly & Company, a US pharmaceutical manufacturer, has outsourced services to Tata consultancy Services of New Delhi, India that include data management, statistical analysis, and medical writing (McDougall, 2006). The decision to outsource goes beyond cost cutting and includes access to a global talent pool, increased flexibility and scalability of company resources, and the maintenance of a global workflow that is 24/7 operational. These same concerns for talent, resources, and workflow are shared by Icelandic companies.

Iceland possesses a literacy rate of 99%, has an extensive welfare system, low unemployment (2.1% is the 2005 estimate), and a remarkably even distribution of income. As of 2001 there were 20 internet service providers and, in 2005, 258,000 Icelanders were internet users. As of 2003, 71.4% of the labor force was engaged in services, 18.3% in industry, and 10.3% in agriculture (CIA Factbook, 2006). Given a population of about 300,000, Iceland is reputed to have the highest internet penetration in the world (86%); its universities are heavily reliant on the web and electronic databases for information.

Given Iceland's extremely high literacy rate, an educational system that is free to all Nordic citizens though the university level, strong internet penetration, large proportion of the labor force involved in the service sector, the development of a new focus on software production, biotechnology, and financial services in the last decade, and a relatively small number of large scale industries (by Icelandic standards) that possess a centralized IS or IT department or function, it seemed appropriate to study the impact of outsourcing and off shoring on the larger corporations.

Definitions

Davis, et. al. (2004) define offshoring as "the provision of organization activities from locations in other countries" and can be accomplished by outsourcing activities to service providers in other countries or by setting up service organizations in other countries. Clearly, the most visible form of outsourcing is the transfer of manufacturing processes to countries possessing lower standards of living and hence, lower labor costs (Friedman, 2006; Davis, et. al., 2004). Grossman and Helpman, 2005) define outsourcing as "finding a partner with which a firm can establish a bilateral relationship and having the partner undertake relationship-specific investments so that it becomes able to produce good or services that fit the firm's particular needs."

For this study we defined outsourcing as the practice of hiring an outside company that can be geographically located either in-country or out-of-country chosen for its ability to complete a given IS/IT problem in a relatively short period of time, the term "short" being dependent upon the type of problem being addressed.

A project was considered to be *off shored* if the purpose of the outsourcing was **primarily** to reduce IT labor costs. In not a single instance was off shoring, in this labor saving sense, a primary reason for outsourcing, but many managers did note that a cost savings did occur but that it was of peripheral importance. Consequently, the issue of off shoring has played no dominant role in Icelandic outsourcing even though their standard of living is very high and the local salaries are substantially higher in Iceland than in most other countries. Outsourcing may occur either in-country or out-of-country.

Method

Eleven selected large companies representing a cross section of Icelandic industry (communications, software, transportation, insurance, retail, banking, power, and shipping) are analyzed from the perspective of their involvement in the outsourcing and offshoring of IT related functions. Figure 1 shows a comparison in the types of industries interviewed with respect to domestic vs. international operations, and the aggressiveness of outsourcing.

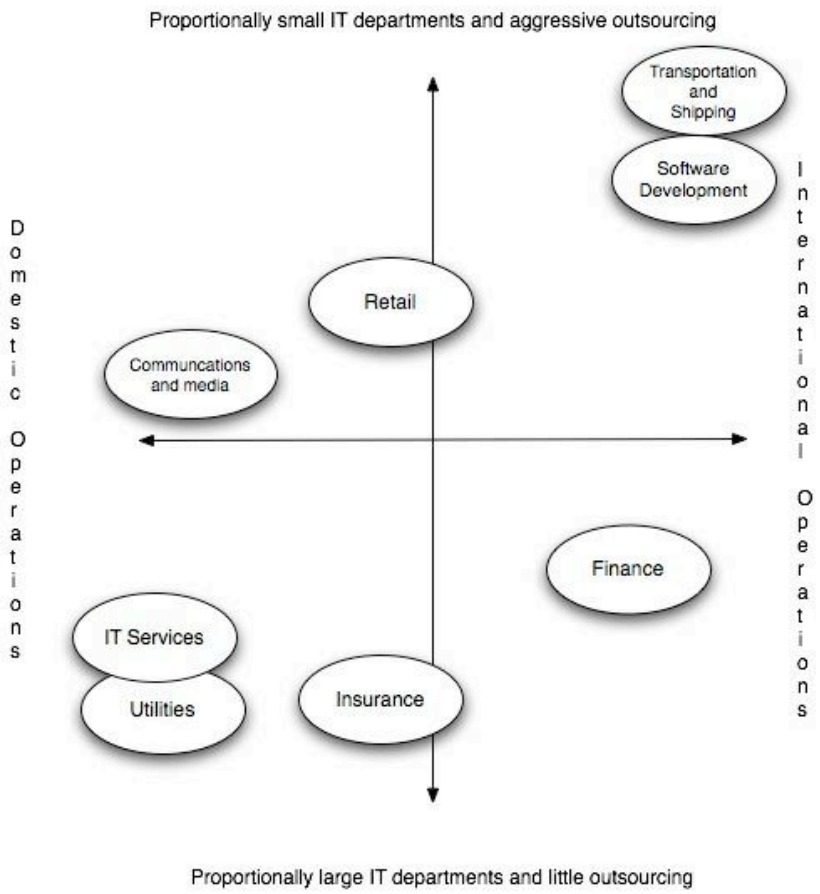

Figure 1 General comparison of industry types interviewed.

Each interview occurred with the corporate CIO, department head, or similar position, using a variation of Klein, et al (1989) and Taylor's (2005) interview technique designed to elicit expert knowledge and secure tacit information that might not otherwise be forthcoming. A set of questions was provided in advance (see appendix A), but only for use in guiding the discussion and ensuring that certain points were covered. Executives were encouraged to reflect on their experiences and share insights. From these conversations it is evident that the complexion of Icelandic corporate strategy has changed over the past five years, and will continue to change in the forthcoming decade. The conversations were taped, converted to CD format with background noise removed as necessary, and compared with field notes. To preserve anonymity, a condition set down at the onset, no individual company is addressed in this paper either by name or by industry other than in the aggregate sense.

A set of specific industries was identified based on company size, annual revenues, and the presence of an identified IS/IT department or function. Appointments were made with IT officials and a pre-meeting set of questions sent, via email, to use in preparation of our interview. Each interview occurred with the corporate CIO, department head, or similar position. The authors spent from one to two hours with each IT official discussing the role of IT operations and its involvement in outsourcing and off shoring. In addition to extensive notes by both authors, interviews were taped, converted to digital format for analysis, and summarized. Since no such study had ever been done previously, we felt it would be best to permit the managers to freely associate with the issues under discussion while holding the overall pattern

of topics to a consistent list of topics. The purpose is to discover outsourcing and off shoring trends that might be emerging in Iceland. It is worthwhile to note that virtually all companies have a strong interest in service oriented architecture, though none specifically articulated it.

To preserve anonymity, the authors agreed not to provide information that might identify, either directly or by inference, company or manager names other than a general reference to the general type of industry. Hence, the results presented in this paper are based on an aggregate of all interviews. We offer an analysis of the perceptions of IT managers in the balance of the paper and address a series of items that either was introduced by the authors or by one or more managers/VPs/CIOs. It is apparent that some items are more generally accepted by IT management than others. If an item is noted as being of slight importance it may be assumed that only one or two managers related to that item; consequently, a strong importance infers that an overwhelming majority, if not a consensus, were in agreement. Items that might be considered important but are not mentioned in this paper are omitted only because none of the IT managers mentioned them.

General assessment of IT/IS Managers

The typical IT manager is an engineer, trained in the field on engineering but has migrated to the computing field. The type of engineering training varied across the companies, but it is interesting to note that in most instances the head of IT did not graduate from a computer information systems or business-related discipline. More than half of the managers were in the middle of their career and were promoted from within the company, the remainder being recruited from similar industries, usually locally based. The typical manager has some form of certification or additional training beyond their baccalaureate, but it is frequently product-specific.

Emerging Trends

1) Labor

In no case was the issue of high labor costs the dominant reason for a decision to outsource. In fact, labor costs were reduced as one would expect, but this reduction was peripheral to reasons of technological advantage. Simply, the current workforce in Iceland has not a sufficient number of individuals with the requisite skills necessary to satisfy the recruitment needs of local industry. Outsourcing, generally to the Baltic nations, some central European countries and only a little to India, sought specialized skills that would otherwise have to be learned in-country at high cost, both financially and timely, and could cause projects to consume excessive company resources. On at least one occasion management commented that sophisticated IT skills can be gotten at will through outsourcing, and planning out a project involving many different technological skill levels can be relatively easily accomplished, as long as they could create an effective and thorough requirements plan.

2) Strategy

Strategy is playing an increasingly important role as industry has realized that IT strategy and business strategy have merged. A majority of Icelandic companies interviewed state that the implementation of IT aspects of strategy is generally left entirely to IT management, and that Boards of Directors either act at the concept level of IT strategy or leave the IT strategy entirely to the executive management to create and implement. All companies sought to secure their

data under their direct control while being able to quickly respond to business needs. In this context, most of the Icelandic business characterized themselves as being agile (Lee, et. al., 2006).

3) Security

Security of data is of serious concern. Companies that outsource to other countries keep rigid control over the data. Subcontractors are provided sanitized test data at best, and frequently work over privately purchased communication lines. Companies that do permit the use of the internet require strong encryption, as would be expected. Employee use of data ranged from extremely restricted to extremely disbursed, depending entirely on the business plan. For example, one company permitted large numbers of employees' access to data, but required regular monitoring by management; another company did not even permit its own IT personnel access directly to the company database.

4) Subcontractors

In some cases, the subcontractor would place their employees on location in Iceland and at highly compensated levels while those individuals lived in country. Upon returning home, subcontractor salaries for the same work were reduced to a fraction (by Icelandic standards).

5) Mid- and Upper-level Employees

Management is growing increasingly concerned with the high-level view of IT operations, so much so that some companies are in-sourcing previously outsourced tasks; in other words, having the vision of IT strategy and understanding the role of technology within the role of business is a sought-after skill, and there is an increasing need for individuals who have this knowledge. The usual technology skills such as network construction, software development and engineering, and database construction, are typically secured through outsourcing. However, individuals who can ***strategically*** develop networks, develop complete and competent requirements specifications, design and model business processes and systems, are in continuing need. Business schools should consider revising the core requirements for future business leaders. While understanding networks, business systems, and database and programming concepts continue to be important, the ability to determine strategic direction, mission, and control of business processes remains a core skill. Individuals able to merge business knowledge with IT strategy are in need.

6) Use of IS/IT Standards for Information Security

Most IT managers were quick to point out that their operations did use some standard, be it the ISO/IEC 17799:2000, SO/ICE 17799:2005, or IST/BS 7799:2002 standard. However, most also said that adoption of the standard was voluntary and used as a guide, and that becoming certified in their particular standard was not important.

7) Establishment of IS/IT Strategy

It is a continuing item of interest to ascertain if business strategy precedes IT strategy, or vice versa, or if they are established concurrently. Generally, the board of directors establishes overall business strategy and leaves the IT strategy to the IT executive. Some boards approve the IT strategy that is brought before them, but the direction of IT services is largely dependent

entirely on the IT staff. Hence, ownership of IT strategy is not shared by the Board of Directors in the same sense as the overall business strategy.

8) Outsourcing

Virtually all Icelandic companies interviewed either engage in, or have engaged in, outsourcing within the past five years. A few have been engaged in outsourcing for about 10 years. Trends that have emerged with respect to company outsourcing are:

a) Specific skill sets can be brought immediately to bear on the problem at hand rather than the IT department having to go through the expense (in time and money) to train internal employees on the tools necessary to complete the task. Some tasks require a specialized skill, but only for a single project of short duration.
b) By outsourcing tasks employee training time is eliminated (for that particular task) and consequently the speed with which a project can be completed is a major benefit to the IT department.
c) Relatively little outsourcing is done in India, and none in China. Outsourcing to mid-European and the Baltic countries was a more common occurrence. Several had less than acceptable experiences dealing with Russian companies, the dominant problem being that of communications. Russian subcontractors generally did not speak Icelandic or English. In spite of the fact that all Iceland IT managers spoke very good English, the absence of a common language placed IT projects at risk.
d) The time difference in outsourcing was generally a modest concern for IT managers. It is apparently better to be in closer time zone proximity, for questions can more easily be answered as each problem is identified rather than an email that attempts to explain the problem, using words that might not be equally understood with respect to meaning and in a language that is not competently known, and responses given, via email, that are misinterpreted at the other end.
e) Of those few companies actively engaged in outsourcing to India, the subcontractors have sometimes placed Indian employees at Icelandic companies for a few weeks to several months, depending on the project. There have been no reported conflicts between existing IT employees and the subcontracted employees.
f) There is relatively little trust in the overall effectiveness and security of the internet. At least one company has purchased its own fiber optic cable and has direct and total control over their data. Several others use the internet and have strong encryption algorithms, but a few use standard SSL encryption.
g) There was no consistent trend with respect to the level of funding for IT operations though the majority of companies specifically wanted to maintain a limited IT in-house presence at financial levels that did not evoke marked attention at higher levels in the company.
h) The overwhelming majority of companies placed high value on centralized data storage and management. It was not uncommon to restrict subcontract employees, and in several cases their own employees, from direct access to the data. Backups of data were always viewed as important but only about half of the companies had a process in place whereby backups were saved off site. In a few cases backups were saved in the same building or a building of close proximity.
i) The average size of IT departments is about 6 people, with supplemental support secured via subcontract employees through outsourced tasks. One company that actively engaged in domestic computing services had a staff of over 100 IT personnel.
j) The time required to bring a project from identification to on-line status is substantially reduced when utilizing subcontracted employees.

k) The need to properly prepare requirements documentation was echoed by **all** to be a major concern. Being able to properly and completely produce an expert document that details the problems to be solved and the means by which the completed project is to be merged with the existing operations, is a sophisticated level of training that is needed to be taught at the university level or hired away form other companies. It was not infrequent to hear that outsourced projects failed to be implemented because the software delivered was not the product desired.

9. Business School Curricula

It is this last item (8k, above) that should be recognized by business schools as being deficient in some business programs, at least those currently in Iceland. Every company interviewed identified the ability to create an effective requirements document was being a skill in high demand. Also, the need for software engineers is, at best, modest. Very knowledgeable software developers are available in other countries at much less cost, and as long as language is not an obstacle to communications, but new graduates who are competent in both business and technology, that is to say, graduates who can bring an overall view of technology operations to business such that strategy can be formulated and competitive effectiveness can be enhanced, are in demand. More concerning this unexpected finding is forthcoming.

10. IT Costs

Most companies in the study reported that IT costs as a percentage of revenue were estimated to be about 2-4% of revenue. In the most successful case of outsourcing it was reported that even though company annual revenue growth was around 40% for the past three years, IT costs were reduced from a fixed number around 700 million ISK (10.4 million USD) to approximately 400 million ISK (5.9 million USD) as a direct result of outsourcing to India as well as the company benefit of increased skill sets of IT capabilities and increased flexibility in the IT infrastructure. The typical case was that outsourcing permitted IT costs, as a fixed number, to remain relatively constant, however the benefits of outsourcing allowed for revenue to increase with external and internal company growth. The worst case reported was a very high monetary loss due to a flawed requirements analysis owing to cultural differences and bad language skills as well as less than desirable outsourcing contract negotiations. The CIO in the worst case scenario was unable to provide figures in this respect.

Conclusion

Iceland is an extraordinarily technology literate country that has embraced the internet and the corresponding technologies. The role of technology has permeated the larger business to the level of adoption of outsourcing as a normal means of doing business. The motivation for outsourcing is not reduced labor costs but rather, there is a better utilization of existing employee skills and the reduction of time in addressing new technology services. IT strategy generally is not formulated in the board room; it is the IT professionals who bring their recommendations to the board where it is generally approved for implementation. Security of data is of paramount importance, but only about half of the companies have backups stored in locations far removed from the company database. Trust in the use of internet cables ranges from high to low. Almost all of the companies have a need for mid- to upper-level employees who have a vision of technology and can suggest methods by which technology can be brought to bear on creating competitive efficiencies. Most IT leaders are engineers by academic training who have learned business knowledge through experience, and many have taken advanced training to enhance their IT knowledge and skills.

While most companies utilize the published standards for IT security, none seek industrial certification.

Outsourcing is used to quickly bring new skills to a project while retaining the existing work force. Most outsourcing is between Iceland and the Baltic countries with India in a distant second position. Russia is generally avoided because of previous negative experiences involving difficulty in communications. Additionally, the proximity of the Baltic time zone to Icelandic time zone is far more desired than the Indian or China time zones. Problems are solved when individuals can conveniently talk.

All companies identified difficulties in establishing a project requirements document. Difficulties in clearly identifying the project needs and expectations, and then bringing the outsourced project back into the company operations, remain a challenge.

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Appendix A

Questions Concerning the Desirability, Benefit, and Risk Associated with Offshoring

The following questions are suggested as a guide to initiate discussion. It is the researchers' intention that these questions guide the respondents in covering specific areas of concern, but the discussion may migrate in other directions based on the experience of the executive. All information is considered privileged and no reference will be made to the individual company or executive without their express permission.

This study of offshoring in Iceland is undertaken as a joint research initiative by faculty from American and Icelandic universities.

1. Have you, or your company, engaged in **outsourcing** (within Iceland or outside to other countries)?

1 A. If not, what would need to change in order to make offshoring more desirable? (Government policy, economic considerations, convenience in identifying offshoring opportunities, etc.)

2. Have you ever engaged in **offshoring,** electronic or otherwise? (any country outside of Iceland)

2 A. To what countries **have** you off shored?

2 B. What role does offshoring play in your company's **long-term** strategy?

2 C. Have you off shored as part of a **short-term** strategy?

3. To what countries would you **consider** offshoring, and **why**?

4. What benefits did you **expect** to incur as a result of offshoring?

4 A. What benefits did you **actually receive** from offshoring?

5. What were the **problems** (institutional, policy, financial, security, governmental, cultural, environmental, infrastructural, etc) associated with offshoring? Has terrorism played any role in your decision making with respect to offshoring?

6. What business functions **have** you off shored?

6 A. What business functions would you **like** to offshore?

7. What reasons caused you **cease, reduce, or redefine** your offshoring strategy?

8. Concerning the issue of **data security**, what factors did you consider to ensure control over your data? For example, a company has complete control over all data that is stored in-house but may have little or no control over data stored elsewhere. What parameters or contract provisions did you put into place to keep risks at an acceptable level? Were you successful?

9. As a result of offshoring, what has been the **annual financial benefit** to your company? If possible, please provide actual ISK amounts per annum and projections for future income.