Software Outsourcing
Quality Achieved by
Global Virtual
Collaboration

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In today’s rapidly changing and highly competitive global environment, offshore outsourcing (contracting of a portion or all of the software development function to software engineers outside the home country) teams working across national borders and virtual organisations have become a fact. The globalisation of the software market has also changed the contextual boundaries of information systems (IS) research and practices to include the wider societal context. Management experiences difficulties when applying traditional management approaches, because of the increased complexity of global organisations and their dependency on people with different underlying norms, values and beliefs. Researchers call for caution in managing global workers. They argue that behavioural traits of diverse work groups can contribute to dysfunctional organisations. Cultural sensitivity has become a core issue.

This article discusses the implications of globalisation in software development and seeks to make more explicit the human dynamics that have a bearing on the success of outsourcing and virtual collaboration. Two models, namely, the e-Sourcing Capability Model for Service Providers (eSCM-SP) and the Software Quality Management – Cultural and Organisational Diversity Evaluation (SQM-CODE) Model, are proposed to bring added value for service purchasers in their search for, selection of and collaboration with service providers.

The eSCM-SP, a capability maturity assessment model related to IT-enabled sourcing, is briefly discussed and the SQM-CODE model, a tool for assessing the fit between organisational and national culture, is presented, and its importance for identifying cultural factors and taking appropriate action in order to achieve a cultural fit between the service provider and the contractor in outsourcing business partnerships is revealed. Copyright © 2006 John Wiley & Sons, Ltd.

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1. INTRODUCTION, MOTIVATION AND PERSPECTIVES

The management of cultural diversity is becoming a significant issue for companies. Owing to
the emergence of global organisations, increasing number of joint ventures and cross-national partnerships, businesses need to embrace people from a variety of ethnic backgrounds and cultures. This has created a new awareness of the importance of understanding other cultures and has contributed to the need to develop a cultural sensitivity. Problems between mother organisation and subsidiaries, resistance, low motivation and low productivity can arise in international operations because of cultural ignorance or insensitivity (Siakas et al. 2003).

Being a global organisation implies having a universal culture (Joynt and Warner 1996). The objectives of global organisations are to create a universal culture in the whole organisation and to integrate multi-domestic operations with individuals who hold opposing work-related values.

The contextual boundaries of information systems (IS) research and practices have changed to include the wider societal context because of the globalisation of the software market. Cross-cultures comparative studies have made attempts to document differences in value systems of managers. There are two views on managing IS in a global context.

One view proposes that managing IS in a global context is largely the same as managing IS in a domestic context and the managers will display similar managerial values despite their cultural differences (Ein-Dor and Segev 1993, Sparrow et al. 1994). In global companies with a strong organisational culture, managers usually demonstrate similar management style (Land 1992). This implies that the impact of culture on organisational systems will decline.

The other view proposes that cultures are deeply rooted in individuals and thus managerial value differences exist because of cultural aspects, different business and legal environments, different languages, and varying technology availability (Ives and Järvenpää 1991, Järvinen 1997, Tractinsky and Järvenpää 1995). This implies that organisations are affected by national cultures and seem to resist the convergence effect of international business (Clark and Mueller 1996, Morden 1999, Smith 1996).

Hofstede (2001) provided strong evidence that national cultural differences shape organisational behaviour at a local level, and that differences in national and regional cultures affect work values. He argued that culture is a collection of characteristics possessed by people who have been conditioned by similar socialisation practices, educational procedures and life experiences. Krishna et al. (2004) affirm that major differences in norms and values cannot be harmonised since they derive from deep-rooted differences in cultural background, education and working life.

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2. GLOBALISATION

Globalisation is a business fact, expanded worldwide beyond domestic boundaries, that is creating an interconnected world economy in which companies do their business and compete with each other anywhere in the world, regardless of national boundaries (Cullen 1999). Globalisation today is an inevitable reality that cannot be ignored. Saeed (2002) states that globalisation has been beneficial to nearly all countries around the world, including advanced industrial countries, the emerging economies and many of the world’s low-income countries with the exception of a few countries which for ideological reasons have chosen not to pursue free trade. New information and communication technology (ICT) capabilities have increasingly facilitated globalisation. Results will be dependent on development policies and strategies.

Globalisation does not imply homogeneity of cultures (Walsham 2001). In general, research in IS has not considered culture when investigating the process of software development. Particularly, quality related issues seem to be missing in the literature. However, many researchers have compared national cultures with organisational cultures (Clark and Mueller 1996, Morden 1999, Smith 1996).

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promoting a strong organisational culture without disapproving and demolishing local converging values and attitudes success is more likely. Similarly, shared stakeholder values are considered to be important for success (Hofstede 2001, Land 1992, Schein 1985). Organisational culture affects individual behaviour directly by imposing guidelines and expectations for the members of the organisation. One of the key issues for managers in global organisations is integration across geographic distance and cultural diversity (Siakas 2002).

Organisational culture is mainly created and maintained in existing frameworks by the founders and the leaders of an organisation through their value system (Bryman 1992, Schein 1985). Three of the most important sources of organisational cultures are, according to Brown (1998):

- societal or national cultures within which an organisation is physically situated;
- the vision, management style and personality of the founder and other dominant leaders of the organisation; and
- the type of business an organisation conducts and the nature of its business environment.

Within a single culture certain values, attitudes and behaviours are either favoured or suppressed. In a global organisation, conflicts and dissatisfied employees will most likely be the result if the values of the employees of the mother organisation are divergent from those of the employees in a subsidiary (Siakas 2002).

The challenges globalisation offer originates from social, economic, legal, political and technological differences between nations, together with cultural differences regarding work values, attitudes and preferences of both employees and consumers. Given the complex nature of globalisation, organisations need to develop high cross-cultural understanding, intercultural communication skills and intercultural management competencies. Management of global organisations that can take account of the cultural context of their endeavours experiences better success.

Global presence does not automatically ensure competitive advantage. Competitive advantage requires the organisation to exploit the value-creation opportunities generated by global presence and to meet these challenges. (Govindarajan and Gupta 2001). In a truly global company the top management and board must be prepared to travel to the subsidiary in order to enable the company to make fast decisions. Large companies have a tendency to be inflexible and do not realise the difficulties they face when trying to remotely control overseas subsidiaries. The large company must be as diligent as its local, small competitors, especially in the emerging markets like China, where the local management needs more involvement from the mother organisation in order for the internal decisions not to become a bottleneck for business growth (Thomsen 2005).

Nothing slows down an organisation more than the inability to make even smallest decisions quickly (Jennings and Haughton 2002). Instead of bureaucracy, global organisations need to be flexible. Flexibility can be improved by the creation of simple and understandable guiding principles regarding decision-making, new actions, initiatives, new products and new directions. The guiding principles need to be communicated to subsidiaries and shared by everyone in the organisation in order to strengthen the organisational culture.

3. SOURCING

Since the Industrial Revolution, companies have struggled with how to exploit their competitive advantage in order to increase their market share and profits. Sourcing is an activity where one organisation provides services to another organisation. Outsourcing entails the purchase of a product or process from an outside supplier rather than producing this product or process in-house. The concept of allocating business activities to another organisation was initially used for manufacturing industrial components. The emphasis for large integrated companies was how to own, manage and directly control their assets (Northfield 1992). In this sense, outsourcing has been used since the mid-twenties. In the fifties and sixties, the emphasis was on diversification and to broaden corporate bases. In the seventies and eighties many large companies developed new strategies focusing on their core business, identification of critical processes and choice of processes that could be outsourced (Northfield 1992). Thus, data-processing entries were commonly outsourced and in the nineties outsourcing was used for entire IT operations and IT-intensive business processes.
The evolution of the Internet has increasingly facilitated organisations to delegate part of their business activities to external service providers and to establish business partnerships beyond geographical boundaries. The business activities being outsourced range from resource intensive operational tasks to critical strategic business processes. More recently, IT-intensive projects and tasks are being increasingly outsourced. Companies may have multiple sourcing relationships in different countries. This may decrease risks of putting all emphasis on one service provider; but on the other hand, additional time and resources are required.

Although the primary motivation for outsourcing is cost-effectiveness, there are many transaction costs that should be taken into consideration including the costs of continuous liaison with outsourcing providers, including organising and monitoring projects, as well as evaluating outcomes, handling legal matters such as signing contracts, ownership and copyright issues. Also potential risks need to be quantified and taken into account. Such potential risks may, for example, include potential costs of contract failure. Also increasing competition for skills and rising costs of doing business are beginning to drive up prices (Plant and Willcocks 2004).

The activities in sourcing can be grouped into (Siakas et al. 2005) the following:

- **Process Outsourcing**: The entire business process, often including personnel and resources, such as computers and software, is outsourced and the process is transferred to the service provider.
- **Project Outsourcing**: A subset of activities with a specific deadline, such as e.g. a software development project, is outsourced.
- **Task Outsourcing**: Outsourcing of usually high-demand tasks, such as unplanned demand, that cannot be met by the internal resources in the organisation.
- **Insourcing**: People are brought into the organisation in order to meet certain requirements and activities within a specific deadline or to add knowledge and skills in order to reduce risk.

Outsourcing allows organisations to focus on broader business issues and to redirect resources from non-core activities towards research, development and activities that provide a greater return. Simultaneously, organisations, by having operations accomplished by outside service providers, who usually are experts in the field, gain access to world-class capabilities, such as new technologies, tools, methodologies and procedures that the organisation may not currently possess. Also advantages, such as improved business focus, competitive advantage through expanded skills, continuous improvement and adoption of best practices are likely to take place. As a result customer companies will be enabled to achieve faster, more efficient, effective and more economical business processes.

When companies outsource they become more flexible, more dynamic and more able to meet the changing opportunities. However, organisations should be aware of the risks and dangers that outsourcing can cause like dysfunctional organisations due to loss of control and in-house expertise, cultural differences and dilution of the company knowledge base when outsourcing. Outsourcing is also a vehicle for sharing risks across many companies. Service providers make investments not only for their own company but also on behalf of their many contractors. By sharing these investments, the risks are significantly reduced. Also for organisations that lack the required resources for applications that need to be developed or modified, outsourcing can be a good solution.

National culture is a major barrier to making global business effective (Segalla 2001). Different nationalities have different expectations as to how employers and employees should act, as well as ways of expressing agreement and disagreement, different styles of management and participation in decision-making, different attitudes toward hierarchy and approaches to teamwork, etc. Regarding software outsourcing, there seems to be more awareness of cultural issues in the literature than about management of software development and IS in general. The literature on outsourcing seems to propose the following:

- Recognition of the fact that cross-cultural training is needed both in advance and continuously (Foster 2000);
- Use of ‘cultural bridging staff’ (people rooted in the country of the sourcing service provider as well as in the country of the client) for informal sharing of experiences (Krishna et al. 2004);
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• Use of common systems, common processes and common compatible technologies (Heeks et al. 2001);
• Recognition of the importance of the communication language (Foster 2000).

In the Knowledge Society, skill-based work will be outsourced, and creative, innovative knowledge-intensive work will remain, but high-quality design requires a profound experience and insight in the methodologies and tools used to implement and produce the product.

4. VIRTUAL COLLABORATION

'Unlike conventional teams, a virtual team works across space, time, and organisational boundaries with links strengthened by webs of communication technologies' (Lipnack and Stamps 1997).

The leadership traits and skills needed with virtual teams are not different from those used with collocated teams. The difference is in the way they are exerted to create the desired results.

Collaboration has three facets (Balstrup 2004), namely:
• Collaboration within each collocated group
• Collaboration between dispersed group of the virtual team
• Collaboration between the groups and the leader.

A potential conflict arises when the team consists of members from different organisational units, because the team does not know where to place its loyalty. In a virtual environment this is amplified because informal communication is reduced (members seldom meet face-to-face). Lewis (1999) stated that ‘Language is a poor communication tool unless each word or phrase is seen in its original cultural context’. Therefore, a successful leader of a virtual team must excel in applying the right choice of communication means along with a profound knowledge of the effect of applying it.

Teamwork is in essence a result of human interaction, but in an environment where organisations formulate strategies for becoming global, working in a common place becomes less common. Two important factors for supporting collaboration are loyalty and commitment. The individuals of the virtual team and the leader must build a cohesive team committed to the common goal, and through interdependent interaction generate group identity and create the feeling of belonging to the ‘we’ group (Balstrup 2004). Creation of cohesion is fragile and requires effective interpersonal leadership.

The cultural dimension divides the teams into culturally homogeneous and heterogeneous teams. Culture is the most difficult to assess, as it embraces facets like language, tradition, values, core beliefs, humour and many more. The virtual leader must possess a profound understanding of the cultural differences within the team. Additionally, the leader needs an employee at the distant location who is a valid substitute for him. An employee who through self-management supported by a trusting delegation performs leadership and loyally exerts the chosen strategy and direction. The benefit of the local leader is to have a person who is able to transform the leadership into the local cultural context and a person to whom the local team can attach in the absence of the virtual leader (Balstrup 2004).

In a cross-national study of managerial value used on 567 managers from 12 nations, it was found that regardless of nationality the value dimension that included the instrumental value ‘broad-minded, capable and courageous’ was ranked as the most important value dimension by all managers (Bigoness and Blakely 1996).

Particular traits are positively related to successful leadership. This requires the successful leaders to acknowledge and reflect on their strengths and weaknesses. They must be motivated to continuously develop themselves and be aware that a present strength can turn into future weakness. Additionally, they must be able to compensate for their own weaknesses by selecting employees or external service providers with complementary strength and empower them to take on the tasks they are more qualified to perform (Balstrup 2004).

5. ASSESSMENT OF CAPABILITIES OF IT-ENABLED SERVICE PROVIDERS

The effective management of cultural diversity in a global context is a challenge and a competitive advantage. Potential for increased ambiguity, complexity and confusion occurs in situations in which a single agreement has to be taken or when overall procedures have to be developed (Adler 1997). Managers who are involved in cross-cultural
communications and negotiations need to develop characteristics such as cultural sensitivity, flexibility and adaptability. However, will these characteristics guarantee success in a multicultural environment? Managers seem to be worried about their own capabilities to be successful in an increasingly complex global context. In order to help service purchasers to search, select and collaborate with service providers, we propose the use of two models, namely the e-Sourcing Capability Model for Service Providers (eSCM-SP) (a capability maturity assessment model) and the Software Quality Management Model – Cultural and Organisational Diversity Evaluation (SQM-CODE) model (a model for assessment of the fit between national and organisational culture).

In the eSCM-SP, it is argued that it is important to identify cultural attributes that impact on service and implementation actions in order to support the close coordination necessary to meet client requirements. The model states that ‘multi-national and organisational differences between the client and the service provider, and cultural differences within the provider may impact the quality of interactions and the overall quality of the sourcing relationships’ (Hyder et al. 2002). It is mentioned that important cultural factors need to be identified and appropriate action to be taken in order to achieve a cultural fit between the service provider and the client/contractor. However, it is not mentioned which cultural factors are important, how to identify them or what kind of appropriate action should be taken. Nevertheless, the fact that a cultural fit between the client and the service provider may impact the quality of interactions is explicitly mentioned seems to be a first step in the recognition of the importance of a cultural fit between factors from the external environment (national culture) and the internal organisational environment (organisation).

Research has tried to identify cultural factors including national factors that influence the effectiveness of software process improvement (SPI) (Biró et al. 2001, 2002; Siakas 2002; Siakas and Balstrup, 2000). Siakas (2002) found that a fit between national and organisational culture plays an extremely important role in all kinds of organisations that promote a climate of satisfied employees and decreased misunderstandings and conflicts due to cross-cultural issues. She also found and statistically proved that a cultural fit between national and organisational culture in global organisations is significant for obtaining commitment and avoiding resistance when introducing change in software quality management issues. A model called SQM-CODE was developed as a result of her research to assess the organisational and the national culture in order to find the cultural fit (Siakas et al. 2003). The model can also be used as a tool for assessing the cultural fit between a service provider and a contractor in an outsourcing business partnership.

5.1. The e-Sourcing Capability Maturity Model

The eSCM-SP (Biró et al. 2003, Hyder et al. 2002; 2004a; 2004b) provides IT-enabled sourcing service providers with a reference model that addresses critical issues related to IT-enabled sourcing (e-Sourcing) and aims to help them in establishing, managing and continuously improving relationships with contractors and in improving their capabilities in developing products and services. It was initially developed to address the difficulties in providing e-Sourcing services and to be used by the service providers for risk reduction, capability determination and improvement in order to continuously deliver high-quality services, as well as to prove their capabilities by certification at a capability level. The eSCM-SP has been designed to complement existing quality models, such as ISO 9001:2000 (ISO, 2005), CMMI (2005) and COPC 2000 (a performance management system for service environments (COPC 2005)), so that service providers can capitalise on their previous improvement efforts.

Version 2 of the eSCM-SP, which was released in April 2004, has 3 purposes (Hyder et al. 2004a, 2004b), namely:

1. to give service providers guidance to help them improve their capabilities across the sourcing life cycle;
2. to provide clients with objective means of evaluating the capabilities of service providers; and
3. to offer service providers a standard that they can use when they want to differentiate themselves from their competitors.

The eSCM-SP consists of 84 practices. Each practice in turn is organised into three dimensions, namely, sourcing life cycle, capability area and capability level. The sourcing life cycle dimension describes the specific phase to which the sourcing service belongs in the life cycle.
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dimensions are: ongoing (covers entire life cycle), initiation, delivery and completion. The capability area consists of ten logical groupings of the practices and aims to help users better remember the content of the model for managing more effectively, building and/or demonstrating capabilities in each critical sourcing function. The capability level contains five capability levels starting from a desire to provide e-Sourcing services, meeting clients’ requirements, controlling through measurement and enhancing through innovation until the highest level of sustaining excellence. The focus in all capability-assessment models is the disciplined examination of the processes used by an organisation against a set of criteria to determine the capability of those processes to perform within quality, cost and schedule, and the ultimate goal is to improve the capability of the processes (Siakas 2002).

In the eSCM-SP there are many similarities with other capability-assessment models like CMMI (Capability Maturity Model Integrated), Bootstrap or SPICE (ISO-15504), as to the belief, deriving from the Total Quality Management philosophy, that the quality of products is mainly determined by the quality of the processes that produce them, that process performance depends to a great deal on individual performance and that the more mature a process is, the better the performance. To improve the capability of a process, the first step is to understand the status of the process and to have a frame or path to follow for improvement.

The eSCM-SP, like other similar models, places proven practices into a structure that helps organisations to assess their maturity, establish priorities for improvement and guide the implementation of these improvements. However, the emphasis in the eSCM-SP model is clearly to a higher degree on human issues, such as developing and sustaining stakeholder relationships and building and keeping a competent workforce, than earlier capability-assessment models. The situation is also different, because in a sourcing agreement there are always two partners, the serviced provider and the contractor, who both have strong interests in a successful partnership and reduction of risks.

The use of the eSCM-SP is valuable for IT-enabled sourcing service providers who want to appraise and improve their ability to provide high-quality sourcing services, reduce risks, add value to their operations and differentiate themselves from competitors. The service providers contribute to the overall success of the contractor organisation. Thus it is in the contractor’s interest to choose a technically competent service provider with a cultural and ethical attitude compatible to the contractor.

In this article, we argue that it would be valuable for contractors to use the eSCM-SP model as a means to assess the capability of potential service providers during the search and selection process and to determine and continuously improve the capability of existing service providers during the collaboration process. In e-Sourcing, there are also critical issues associated with initiation and completion of the contract between the service provider and the contractor.

5.2. SQM-CODE

The main objective of the research study that lead to the development of the SQM-CODE model was to add to the knowledge of what factors influence successful software quality management systems (Siakas 2002). The research, in particular, examined those factors that form a cultural and organisational perspective. The research question that the study addressed was to what extent cultural factors influence the successful adoption and implementation of a software quality management system. The analysis considered factors from both national and organisational areas. The existence of quality-oriented management procedures (similar to the procedures identified in capability models) was investigated empirically, together with the awareness of quality issues among the workforce.

The research method used was a contemporary comparative multi-method also called triangulation, using both quantitative (307 questionnaires) and qualitative investigation (87 interviews) in organisations developing software in Denmark, Finland, Greece and the UK. Consequently, and by its very nature, the investigation utilised the strengths of cross-national comparative studies.

The SQM-CODE model assesses the cultural fit between national culture and organisational culture and comprises two sub-models, namely the C.H.I.D.D.I typology and the Authoritarian–Participative model (Siakas 2002).

The C.H.I.D.D.I typology, which is based on Hofstede’s Power Distance and Uncertainty Avoidance dimensions, classifies organisations into four dimensions, namely, Clan, Hierarchical, Democratic and Disciplined. This classification defines the
national culture. Simultaneously, a suitable software quality management system is also proposed.

The Authoritarian – Participative sub-model defines the organisational culture considering organisational characteristics such as organisational structure, degree of formalisation, management style, leader’s role, handling of rules and degree of control.

The final two-axed values obtained from both assessments show the cultural fit. The closer the values are, the better the fit. The values can be plotted into the four quadrants of the C.HI.DI typology for a graphical representation.

The self-assessment of the SQM-CODE will give a fast response regarding the basic underlying cultural fit or dichotomy between organisational and national culture. A full SQM-CODE assessment includes an in-depth analysis aiming to identify critical cultural factors and to propose appropriate action in order to achieve a cultural fit. Our findings from a field study (Siakas 2002) showed statistically significant evidence that if there is a fit between the organisational and the national culture, then there is higher employee satisfaction and problems are solved more smoothly. A dichotomy is highly likely to generate dissatisfaction, conflict and ultimate failure.

Global organisations would benefit from using the SQM-CODE in their subsidiaries. The organisational culture in the mother organisation might not be suitable in other countries. The mother organisation has to be aware of the differences in cultures and be flexible enough to take into consideration differences between the organisational and the national culture.

For organisations that aim to delegate part of their business activities to external service providers and/or to established business partnerships beyond geographical boundaries, an assessment of the cultural fit between the contractor (the global organisation) and the business partner (service provider) would be beneficial in order to save a lot of effort and money on business that do not have the cultural foundation to be successful without a lot of dynamism and hard work.

6. CONCLUSION

Globalisation today is a reality, having created numerous challenges for managers worldwide. Increased and improved capabilities of ICT facilitate continuous expansion of globalisation. Being present in multiple countries means adoption to the local environment and tailoring of products according to customer needs and preferences. Outsourcing and virtual collaborations prompt for cultural sensitivity, flexibility and adaptability, together with high awareness of risks and dangers due to cultural differences. Globalisation is a competitive advantage if handled in a right manner. In order to help service purchasers to search, select and collaborate with service providers, we proposed the use of two models, namely the eSCM-SP (a capability maturity assessment model) and the SQM-CODE model (a model for assessment of the fit between national and organisational culture).

Top-quality and just-in-time approaches together with low-cost products and services have become core values. A critical core factor is culture. Emphasis is put on understanding, managing and taking advantage of cultural differences not only among employees in the global organisation or between service providers and contractors in outsourcing business partnerships but also of cultural differences between clients in the global market. Apart from the use of the eSCM-SP and the SQM-CODE mentioned above, it is crucial for the purchasing company to master the ‘art’ of virtual collaboration and be highly aware of the risks and dangers that outsourcing can cause, such as dysfunctional organisations due to cultural differences and dilution of the company knowledge base when outsourcing. In the Knowledge Society, skill-based work will be outsourced, and creative, innovative knowledge-intensive work will remain, but high-quality design requires profound experience and insight in the methodologies and tools used to implement and produce the product.

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