

Certification as a Mode of Governance

ISO and CMM in Offshore St. Petersburg

Melanie Feakins

Seoul National University Department of Geography

1. Introduction

The globalisation of software production processes is a maze of connected phenomena with dramatically increasing importance as the development of IT related industries and services escalates on a global scale. While commercial and industrial software production and related services are historically associated with advanced industrial economies of the North & West, contemporary changes of the past decade suggest that the industry is developing rapidly on a global scale incorporating countries that have historically been classified as '2nd and 3rd world' or periphery and semi-periphery by different theoretical approaches. In the rest of the paper I use the term 'West' to mean North America and Western Europe because in the context of offshore outsourcing in St. Petersburg, Russia, the West (Zapod in Russian) is the colloquial and meaningful political/economic reference. While India is widely recognized in the IT sector as a site for offshore production, Ireland, Israel, China, the Philippines, Singapore, Poland, Bulgaria, and Russia are increasingly regarded in the industry as places for producing software and related services offshore. The growth of the industry outside of North America and Western Europe is notably not a simple expansion of software production and IT services to targeted domestic economies; Rather, this growth has a specific international character as studies of the emerging 'offshores' show that software production and services are targeted specifically towards the export of software services and products (Grimes 2003; Arora, Arunachalam, Asundi and Fernandes 2001; Amcham.ru 2001).

The intensification and expansion of software services and production activities at different global 'offshores' are revealing indicators that the industry is undertaking a specific form of globalisation. The most notable of the offshore software sectors is India, where the

software outsourcing sector has grown from revenues of 110 million USD in 1990 to an expected 6.3 billion USD for 2001-2002. And even with a challenging environment of the early 2000's, the 'export-oriented software and services sector logged 26 % growth in 2002-2003.# The phenomenal growth of the offshore sector and its links to networks in the international market has given India's software export industry 1.9% of the global market in 2001-02.# In different and new case, the Russian offshore market that began roughly in the middle 1990s, was valued between 60-100 million USD for the year 2001 with estimated growth rates wavering from 15 to 20% annually The real processes involved in this globalization, beyond the acknowledgement that offshore sites are experiencing growth, include the: (re)locating of software production activities, establishing and expanding 'sites' of production, forming new constellations of firms linked by contracts for production, and struggling to locate forms of governance that address the technical, managerial, quality and control related aspects of software production. The cautious shifting of contracts and firms for software production away from the developed, educated, costly labor sites in the West towards the educated, less-developed, lower-cost sites elsewhere involves new methods and logics for organizing the connections between firms in the West and in the 'offshore'.

One of the dominant practices of offshore software firms to make themselves recognisable to the globalising market demand for software production by seeking international quality standards certification, CMM and ISO. The certification procedures in the software industry involve the grading of: production processes, organizational structure, documentation of structure and roles, and consistency of performance in production within the firm. Certification does not guarantee the quality of final products; Instead it marks the quality and consistency of production process which is more conducive to software outsourcing. While offshore software firms are seeking certification as a way to increase their recognisability within the international market, the adherence to stipulations proposed by the certifications is regarded by many firms as significantly worthy in its own right. This paper explores certification from the view of offshore Russian software firms, exploring how the perceptions of need for certification have become a significant theme within the offshore sector.

The paper has 3 further sections. The first explains the relevant certifications used in this industry, CMM and ISO. The next sections explores findings from the field research, with reference to how certification is understood in relation to the market, management, and internal organization. The research was conducted by the author; It consisted of a series of semi-structured interviews with owner/managers, project managers, software engineers, and

industry organisers from 19 outsourcing firms in St. Petersburg. The interviews were conducted around a series of topics raised and queried, but were open to exploring subjects and issues raised during these meetings. The interviews were transcribed and were complemented by notes taken during the interview and company documents describing firm histories. The material used in this paper takes quotes directly from the transcribed texts of the interviews. The final section shows how certification is introducing a form of governance to expansion of firms in this industry.

2. CMM and ISO

The establishment of ISO and CMM guidelines for the structuring of quality production processes has placed, in the amorphous field of possible strategies for software production, specific principles and guidelines to shape these processes. ISO is a series of standards for quality management systems officially labeled the ISO 9000 series. It was published and is maintained by the International Standards Organisation, which is European based entity that began as a federation of engineers after the Second World War. The first version of ISO 9000 was published in 1987, with a significant upgrading of the certification guidelines in 1994 (Arora and Asuni 2000). In the year 2000 ISO established the series ISO 9001-2000 as a revision/update to the previous version to the 1994 version, taking into account 'previous experience of the organization with and emerging insights into generic management systems' (<http://www.iso.ch/iso/en/iso9000-14000/iso9000/faqs.html>). CMM is an acronym for the Capability Maturity Model for software and was developed by the Software Engineering Institute at Carnegie Mellon University in the US. The Software Engineering Institute, which is a federally funded research and development center at Carnegie Mellon University was established in 1984 by the US Department of Defense 'with a broad charter to improve the state of the practice in software engineering' (Paulk 1999, 1). The CMM is intended to help software organizations 'improve their software processes in terms of an evolutionary process from ad hoc, chaotic processes to mature, disciplined software processes' and achieves this through categorizing maturity into five levels, 'Initial' as Level 1 and 'Optimizing' as Level 5 (Paulk 1994, 3). The CMM for software is described to be a roadmap for software process improvement that has had a major influence on the software community around the world (Paulk 1998, 1995).

Through appealing to elements of 'rational unified process'/'best practice'(CMM), and defined/documented processes for external quality assurance (ISO 9000 series), these guidelines offer established principles for how to organise processes within firms (See Paulk for detailed comparison). Each proposes ways for software firms to structure their internal organization, quality management, production processes, and quality assurance. These codified standards introduce ideals that embody principles of efficiency and quality, which allows the labels of CMM and ISO to be invoked within the industry as a description of both current practice and development goal. The process and management information held in these guidelines is based on ideal practices of Western firms. Within the offshore industry, CMM and ISO have become symbolic reference points that are used to indicate specific awareness and knowledge regarding 'Western' organization styles and practices.

3. Certification for Market Management and Organisation

The complexity of what 'the market' is and how it is assumed to coordinate offshore software outsourcing is revealed by examining how certification interacts with, and constitutes, ideas of the market from the view of Russian software firms. The market, though rarely colloquially defined in the industry, is activated in a series of discourses that are associated by the common reference to what the 'market' is said to possess and create. These discourses portray 'the market' as: creating and articulating demands, fostering and enabling opportunities for success, experiencing downturns, becoming increasingly tight or competitive, and finally, as a space where contracts are to be won on a competitive basis. The discourse seems to create images of the market as something 'out there' with its own existence, knowable mainly through what is said about it. At the same time, the market is portrayed in terms that carries legal, managerial, and economic information such as: American, European, Scandanavian and British; offshore and domestic; public and private. This bifurcation of discourse and description (I.e. portrayals of market principles and effects versus named cultural, political, and economic market identities) is a significant colloquial response to the incomprehensible 'global market', providing space for further specific articulations. The idea of the 'open market' has emerged as another discourse and it is invoked with particular reference to certification, which means ISO and CMM.

The software firms in the offshore sector are constantly creating and interpreting both

what the market is and how market boundaries are experienced in ways that are antithetical to portrayals of the market as openly and fairly competitive. Ideas about the market and its 'separate' spheres were continually raised within discussions of certification. In an interview with several owner/partners of a software firm in Petersburg, we began to discuss the possibilities of certification. Addressing the idea of potentially seeking certification of ISO or CMM, one of the partners said:

'Most of our customers are not asking us to provide some certificate for management. Of course when we are working in the open market it is highly desirable to have such kinds of certification. I think that it's a lot of additional work to provide all these documents, but that may be paid with new contacts.... So we are considering this, but not immediately. We are rather thinking of just establishing our own process and getting a certificate for it. We have a good coding standard, much more developed, for example, than one of our customers. One of our customers first demanded that all of development should be according to their internal coding standards. At the same moment, when we had just got acquainted with them, we provided our own coding standard to them. Their requirement remained in the statement of work. And a few weeks ago we asked 'Will you give your coding standards so that we can follow it?' and they answered, 'We'd rather you follow your own one! (laughs) We are happy with your version'.

His separation of current client relationships from the realm of the 'open market' indicates two things. First, the active client relationships are not taking place within the 'open market' as it is conceived as the sphere where contacts and contracts are established, not where work is conducted. Second, and perhaps more important, he finds that when working in the open market 'it is highly desirable to have such kinds of certification'. There is a clear equating of possessing certification with a better position/experience of working in the open market which is accompanied by a sense of being outside of the main experience thus far. Being outside of the main market, or outside of the 'open market' is a theme explored more widely in the study of post-socialist economies.

In the same interview as the above, when the topic of quality and standards of the firm's processes and 'open market' requirements for certification were raised, one of the other owner/managers said:

'This is an issue. This is a small company and because of this we need strong and formalized rules for checking the quality of our products. Of course if, I hope, if our company will grow, in this case, as we will be big, I think we will provide more formalized steps in testing and development. Now we use the preferences of a small firm, but it's the situation at the present moment. When we change our status, our size, of course the situation will change. We completely understand, if we want to go with, the open market- we will have to get CMM or ISO or so on. We know this very well.'

Here again, the 'open market' figures as a reality commanding different types of recognition and practices than current relations. Certification seems to be a necessary part of successful market participation because 'talk' around the market suggests that certification is almost a pre-requisite for participating. Beyond the notions of what the open market requires, it is unambiguous that the development and growth of the firm, in particular the formalization of its processes, should be guided by one, or both, of these certifications.

There is a continuous flow of statements about the improvement and development of management and project leadership skills within the offshore community in Russia generally, and St Petersburg specifically. Though all but one of the firms interviewed was a new 'private' firm, the self-perception of weak 'ancillary capabilities' including management and organization were often alluded to (Radosevic 1999). The concern to develop management practices that were fitting within the industry and to the projected demands of western clients created a specific expectation of certification. Within this specific situation of craving management, ISO and CMM operate as markers of western management practice, and as importantly, indicate recognition of the styles and preferences of western management style.

In an interview with an owner/manager of a firm in Petersburg, we were talking about the certifications of ISO and CMM when the interviewee told me they had been preparing for a CMM evaluation. I asked whether the preparations for CMM had been helpful in terms of internal structuring. He said:

'Yes yes. That's right. Because,.. because its very important for us, especially as we don't have education in management area. For us, its very important for us to have a milestone. Some described paths we have to follow. Its really helpful for us, very helpful. Contacts with foreign experts, with assessors, people who have been working in foreign companies, and who have real experience. At least who can tell

us, you have chosen the right way. Its very important.' (my italics)

Later in the interview, he spoke about the company's support for education of its management, specifically in the area of business. When we were talking about educational background, he said:

'... all my top mangers who now work for (this firm),... unfortunately they finished their education in a past life. In the past life, I mean before our changes (before perestroika). At that time, we had never heard of the word 'marketing' for instance, or 'management'. We used to study only the technical parts of software development work, or the technical parts of any industrial process. When we were a small company, I think it was not very important. Now its really important because we understand that to manage, we have to have special skills to manage a middle-sized company. We feel that it is necessary now.'

The references to certification, its meaning, and the purposes it can serve obviously extend beyond ideas of open market and signaling. Here certification is extended to gaining international knowledge and expertise, in addition to appraisal of having followed a worn and successful path. There is some sense of certification as limiting the risks of experimentation with form. In the first response above, the owner/manager said 'because its very important for us, especially as I told you, we don't have education in management area. For us, its very important for us to have a milestone. Some described paths we have to follow.' Certification and its proposed guidelines for structuring the firm are understood as a type of externally defined pathway where a satisfactory evaluation signals correct type of development within the firm.

4. Regimes of Certifying as Modes of governance

Certification as governance requires an examination of the categories, logics, limits, and frameworks that are enabled through the ways that certifying is regarded and taken up by people involved in this industry. The web of governance through certifying is created by the connections between: growth of the firm; participation in the open market with large, mature companies; the need to take up recognisable tags that mark the quality of software

production process; displaying awareness of, and compliance with, industry norms and expectations; improvement of processes within the firm by following the proven and recommended guidelines and advice of ISO and CMM; and the passing of recognizable milestones to measure and attest to improvement. Certification holds a central influence in this web because it is seen to provide a relevant external position; But it is, in fact, a definitive point in all of the above which is why it can be viewed from the perspective of governance.

The restructuring that occurs within firms by virtue of following these certifying guidelines is central to the how certification is part of embeddedness. Because ISO and CMM are based on stylized practices of mature and efficient organisations following 'rational unified process' and formalised structures for work flows, offshore firms that embody and practice these notions become versed in the language spoken by western clients. The familiarity with the categories and labels used for work, expected production flows, and reporting norms that these certification regimes provide is a point of access into the global for offshore outsourcing firms. It offers a linguistic and practical access to the demands of western firms. The knowledge that is gleaned and absorbed from 'international certifications' or sometimes 'international expectations' is piece of the embedding process whereby the 'offshore' is becoming part of the production milieu.

I would like to gratefully acknowledge the research support of the British Academy, Nuffield Foundation, and Jesus College Oxford. The British Academy and the IGU Commission on Economic Spaces made it possible to present this paper at 'New Economic Spaces, New Economic Geographies?' in Vancouver, Canada in the summer of 2003 where many helpful comments were offered. I would like to thank Julie Cidell and Roger LeHeron.

■References

- Arora, A and Asundi, J. (2000) 'Quality Certification and the Economics of Contract Software Development: A study of the Indian Software Industry.' Working paper H. John Heinz III School of Public Policy and Management and Carnegie Mellon.
- Arora, A and Athreye, S (2001) 'The software industry and India's economic development' Working paper. H. John Heinz III School of Public Policy and Management and Carnegie Mellon University -(forthcoming Information Economics and Policy)
- Arora, A, Arunachalam, V.S., Asundi, J, Fernandes, R. (2001) 'The Indian Software Services Industry' in *Research Policy* 30: 1267-1287.
- Correa, Carlos M. 1996. 'Strategies for Software Exports from Developing Countries.' *World Development*, Vol 24, No 1, pp 171-182.
- Dicken, Peter, Kelly, Philip F., Olds, Kris, and Yeung, Henry Wai-Chung (2001) Chains and networks, territories and scales: towards a relational framework for analysing the global economy. *Global Networks* 1, 2 89-112.
- Heeks, Richard 1998. 'The Uneven Profile of Indian Software Exports' working Paper No 3 from Development Informatics Series, Institute for Development Policy and Management, University of Manchester.
- Paulk, Marc (1994) "A Comparison of ISO 9001 and the Capability Maturity Model for Software," Software Engineering Institute, CMU/SEI-94-TR-12.
- Paulk, Marc (1995) 'How ISO9000 Compares with CMM', IEEE Software.
- Paulk, Marc "The Rational Planning of (Software) Projects," Proceedings of the First World Congress for Software Quality, ASQC, San Francisco, CA, 20-22 June 1995, section 4.
- Radosevic, Slavo 1997. 'Systems of Innovation in Transformation: From Socialism to Post-Socialism' from *Systems of Innovation: Technologies, Institutions and Organisations*. Edited by Charles Edquist, Pinter 1997.
- Radosevic, Slavo 1999 'Alliances and Emerging Patters of Technological Integration and Marginalization of Central and Eastern Europe with the Global Economy' from *Foreign Direct Investment in the Former Soviet Union*. Eds Dyker D., Edward Elgar.
- Radosevic, Slavo 1999(b). 'International technology transfer policy: from "contract bargaining" to "sourcing"' *Technovation* 19, pp 433-444.
- Torrise, S. (1998) *Industrial organisation and innovation: an international study of the software industry*. Cheltenham, Edward Elgar.
- U.S. Department of Commerce National Trade Data Bank 'Russia Software and Services'.