

# The Maturation of the Russian Offshore Software Industry

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**Abstract:** In the decade of the 1990's, India leapt ahead of all other competitors for off-shore programming business, giving the impression that Russia had not lived up to its potential. This paper uses case studies of firms and clients and available literature to investigate what Russia has achieved so far, what bottlenecks and hindrances have prevented it from going further, and how those problems are now being addressed. Based on the Heeks/Nicholson and Carmel models, it is concluded that there have been important improvements in domestic input factors, infrastructure, and software industry characteristics; some improvements in linkages with customer firms; and relatively little progress in improving national vision and strategy. The industry has achieved a "platform of maturity" from which further growth is now possible.

Keywords: Russia, Russian Federation, outsourcing, offshore, programming, maturity

## Introduction

By 1989, the Indian government was already actively involved in subsidizing and promoting the offshore programming industry [16]. At the same time in the Soviet Union, a real software industry was only beginning to emerge. Programmers had only recently won the right to sell their own programs for a profit, and the first “co-operative” enterprises had begun to form. The State Committee for Computer Technology and Informatics was offering lists of “cream of the crop” Soviet programs for purchase by the West, and the idea of hiring out large numbers of programmers was considered a less enticing option. Already at this time the theme of Russia’s excellence in science-intensive programs had been struck. But numerous barriers existed in Russia as it remade itself into a capitalistic country, and Russia was largely unprepared to capitalize on the Y2K scare. By the end of the decade Indian sales were measured in billions, while Russian sales were measured in millions. It seemed as though Russia had not lived up to its potential.

An “accepted wisdom” has arisen about the Russian offshore industry that is based on market research studies about on the industry’s status [24, 37, 48], and on other publications that laid out rationales for and against outsourcing to Russia [23, 28, 38, 52, 53]. No recent academic literature is exclusively devoted to assessing the successes and shortcomings of this industry so far, although Heeks and Nicholson benchmarked Russia in [17] and Carmel made several references to the Russian industry [8].<sup>1</sup> The “accepted wisdom” is frequently repeated and elaborated in other reports [14], as represented in this consolidated list in the sidebar.

### Accepted Wisdom About Russian Offshore Programming Industry

#### PLUSES:

- Excellence of Russia’s IT Human resources, e.g. in-depth technical skills, R&D experience, experience with complex projects
- Excellent education system
- European / Western Culture
- Location (near to Europe and the U.S. east coast)
- Low Labor Costs

#### MINUSES

- Inexperience in offshore software development; poor understanding of business practices and project management on the part of Russian software firms
- Poor English skills
- Difficulty of visiting Russia due to visa requirements
- Bandwidth costs; deficient telephone and data communications infrastructure
- Lack of certification organizations (and CMM certified IT firms)
- Offerings too narrow; too little forward-looking strategic planning
- Poor marketing capabilities; lack of a campaign; poor foreign representation
- Poor business environment (intellectual property protection, tax and labor laws, perceptions of corruption and instability)
- Lack of industry associations as effective as NASSCOM
- Lack of meaningful support by the Federal government for the offshore industry
- Lack of world track record; perceptions of software piracy

<sup>1</sup> See Dyker for an earlier view [12] and [42] for a rich case study of one instance of using Russian programmers.

This paper examines this accepted wisdom in depth. We ask the question: has the Russian industry now reached a sufficient level of maturity in order to become a permanent major player among the outsourcing nations? We use case studies of firms and clients and available literature to provide evidence regarding the maturation of the industry, to identify bottlenecks that have prevented this industry from attaining greater success, and to see to what extent those bottlenecks are being removed.

## Methodology and Initial Benchmarks

In 2002 Heeks and Nicholson synthesized a number of studies of software export industries to develop the Software Export Success Model (SESM) [17]. Carmel built upon the SESM, deriving his Oval Model of success factors (OM) [9]. Table 1 shows the five factors and sub-areas within each factor. In the SESM, the governmental vision and strategy is envisioned as a foundation upon which domestic input factors are based, leading to the creation of the national industry ( $V \rightarrow IV \rightarrow III$ ). From the top down in the SESM, external demand leads to linkages with the offshore industry ( $I \rightarrow II \rightarrow III$ ). The OM places the industry (III) and input factors (IV) more loosely in the middle of an oval with national policy (V) as a driver on the left and linkages (II) as a driver from the right leading to demand outside the circle. The OM emphasizes the idea that factors within the circle overlap and influence each other in more fluid ways than might be inferred from the SESM. Table 1 also summarizes the Heeks/Nicholson 2002 industry assessment, which relied heavily on earlier reports [23, 53].

For our study, many primary sources were consulted from the Russian literature as well as other press sources and reports. These sources and the SESM and OM helped generate questions for interviews. Our questionnaire consisted of 16 questions, some open-ended, and some with specific subparts for 47 questions and sub-questions. These questions corresponded in many respects to the SESM/OM (see Table 1 - seven questions were counted in both the human capital and linkages categories).

Our sample of firms was selected to achieve depth and breadth. We contacted 16 firms in Nov.-Dec., 2003 for open-ended telephone interviews, of which 14 agreed, providing depth in the form of five large and medium firms from Moscow and another five from St. Petersburg; and breadth in four small and medium sized firms outside these cities (Table 2). Since our focus was on maturation, we needed to talk to some firms at the leading edge. Our sample included three of the five firms voted best by their peers in the 2003 Outsourcing-Russia.com survey [37]. We excluded wholly owned development centers (since these centers do not compete for business in quite the same way as ordinary firms), firms that mainly sell packaged software, and hard-to-identify free-lancers who are not a central part of the industry. Typical respondents were the firm's owner, CEO, or marketing director. We also interviewed six US-based firms that use Russian programming teams directly to enhance their own IT shops or serve as intermediaries between the Russian programmers and the end-user firms. Less formal interviews and presentations at the June, 2004 Russian Outsourcing and Software Summit in St. Petersburg, Russia provided additional information for the study.

Table 1: Software Export Success Model (SESM) and Oval Model and Questions Derived from Them

SESM	Hicks/ Nicholson 2002 Assessment for Russia	Sub-areas for each success factor	Emphasized in		
			SESM	Oval Model	Our questions
<b>I. Demand</b>	High external demand, internal demand less evident	<b>I. Demand</b>			
		Demand from abroad for offshore work	HI	HI	
<b>II. International Linkages and Trust</b>	Diaspora-based links. Lack of trust and knowledge, partly due to high levels of piracy.	Domestic demand for software	SI	LI	
		<b>II. International Linkages</b>			13
		Trust - development of relationships, common culture, language	HI	HI	2
		Diaspora - links with émigrés abroad	HI	HI	
		Marketing and In-Country Representation	HI	HI	1
<b>III. Software Industry Characteristics</b>	Some clustering of a relatively small industry around Moscow, St. Petersburg and Novosibirsk	Piracy and Copyright - effective laws, protection of intellectual property	HI	LI	
		<b>III. Industry Characteristics</b>			8
		Competition - spurring quality, efficiency, etc.	HI	HI	
		Clustering - co-location of several firms	HI	HI	
<b>VI. Domestic Input Factors / Infrastructure</b>	Significant, low-cost, highly skilled human capital. Poor finance, marketing and telecoms; few English or skills in higher value chain activities such as project management	Collaboration - through industry associations, etc.	HI	HI	
		<b>IV. Domestic Input Factors/Infrastructure</b>			
		Human Capital - technical skills, education, experience, English	HI	HI	14
		Quality of Life/Wages - sometimes at odds	LI	HI	1
		Technological Infrastructure	HI	HI	1
		(Financial) Capital	HI	HI	1
<b>V. National Vision and Strategy</b>	Vision and strategy lacking, some focus on software services	Research & Development	HI	LI	
		<b>V. National vision/strategy (governmental policies)</b>	HI	HI	3
		Participation of industry association	HI	HI	
		<i>Open-ended questions of more general nature (not part of models)</i>	n/a	n/a	10

KEY: HI = highly important, SI = somewhat important, LI = less important or omitted  
Sources: [17] and [9]

Although our sample is not necessarily representative, it does contain typical firms. Most are owned by Russians although some are incorporated in the U.S, and the development staffs are mainly in Russia (we found some in Kazakhstan, Belarus, and some developers being flown in from CIS countries and housed in Dubna, Russia.) Like the firms profiled in the 2003 Outsourcing-Russia.com survey [37], the main offshore

**Table 2: Characteristics of Sampled Software Firms**

Firm	Office Locations	Where Incorporated	Year Founded	Number of Permanent Employees	% Revenue from Off-shore Services	Major Offshore/Nearshore Locations	Quality Assessment CMM/ ISO
Aplana <a href="http://www.aplana.com">www.aplana.com</a>	Moscow Novosibirsk, Russia USA	USA	1999	150	40% off-shore	USA: 60% Europe: 40%	ISO9000 (CMM 4 appraisal planned in '04)
Arcadia <a href="http://www.offshore-software.ru">www.offshore-software.ru</a>	St. Petersburg Finland USA	Russia	1993	110	100% off-shore	USA Europe	ISO 9001
Auriga <a href="http://www.auriga.com">www.auriga.com</a>	Moscow USA	USA	1990	150	Primarily offshore	USA #1 W. Europe	Preparing for CMMi appraisal
Conteksoft <a href="http://www.conteksoft.com">www.conteksoft.com</a>	Tomsk, Russia	Russia	1990	50	Switching to offshore	W. Europe, UK, Germany, USA	-
Digital Design <a href="http://www.digdes.com">www.digdes.com</a>	St. Petersburg UK USA	Russia	1992	140	35 % off-shore	USA: 15 % UK: 5 % Sweden & Finland: 15%	CMM 3 ISO 9001
EPAM <a href="http://www.epam.com">www.epam.com</a>	Moscow, Belarus Netherlands, USA, China	USA	1993	550	95 % off-shore	USA: 80% Europe: 15%	CMMi 4 ISO 9001
Kanar Software <a href="http://kanarsoft.com">kanarsoft.com</a>	Voronezh, Russia	Russia	1993	21	> 50 % off-shore	USA (main location) Australia	-
Krista <a href="http://www.krista.ru">www.krista.ru</a>	Rybinsk, Russia	Russia	1992	150	mostly domestic	None yet, German contract expected	Preparing for ISO 9000 in 2004
Lanit-Tercom <a href="http://www.tercom.ru">www.tercom.ru</a>	St. Petersburg	Russia	1991	300	70-80% offshore	USA: 70-80% Europe: 20-30%	(CMMi 4 appraisal planned for 2004)
Luxoft <a href="http://www.luxoft.com">www.luxoft.com</a>	Russia (Moscow, Omsk, Nizhniy Novgorod, Dubna) USA, Armenia	Russia	1992 (IBS)	600	100% off-shore	USA: 80% Europe (mostly UK): 20%	CMM 5 CMMi 5 ISO 9001
RekSoft <a href="http://www.reksoft.com">www.reksoft.com</a>	St. Petersburg	Russia	1991	170	69%	Europe #1 USA	ISO 9001
STAR Software <a href="http://www.star-sw.com">www.star-sw.com</a>	St. Petersburg USA, Germany	Russia	1991	150	primarily offshore	USA, Germany, & Scandinavia	CMM 3
Telma <a href="http://www.telma.ru">www.telma.ru</a>	Nizhny Novgorod, Russia	Russia	1991	350	almost all offshore	USA: 70-80% Europe: 20-30%	CMM 5
TerraLink <a href="http://www.terralink.ru/en/">www.terralink.ru/en/</a>	Moscow, Kazakhstan, Canada, USA	Russia	1989	80	40% off-shore	USA, Canada, Europe	-

market for firms in our sample was the U.S., with some reporting significant activity in Germany, Scandinavia, and the U.K. Ten firms in our sample indicated that offshore customers were their primary market with four of these reporting themselves to be almost exclusively in the offshore market.

## The Industry

We begin this section by briefly examining what has been accomplished so far in the industry itself, as the size and scope of what has been built is an important element itself in assessing its competitiveness and maturity.

With roots in the perestroika reforms of the late 1980s, the Russian offshore software industry has been in existence for over ten years. Depending on whose statistics are most believable, the industry generated anywhere from \$200M to \$450M in 2003 [7], with the industry association RUSOFT claiming \$350M in Dec., 2003 [4]. Gartner Group’s Market-Visio found that there were 102 commercial companies, 86 small companies and programmer groups, and 67 software development centers of international vendors in Russia as of 2002 [18]. Therefore, according to Carmel’s taxonomy of software exporting nations, Russia has taken a solid position as a “Tier 2” nation by meeting all three criteria; longevity (10-15 years), size (>100 firms, <“hundreds”), and revenues (>\$200M, <\$1B) [8].

Based on the authors’ compilation drawn from websites, Figure 1 shows the size of offshore software firms by location.

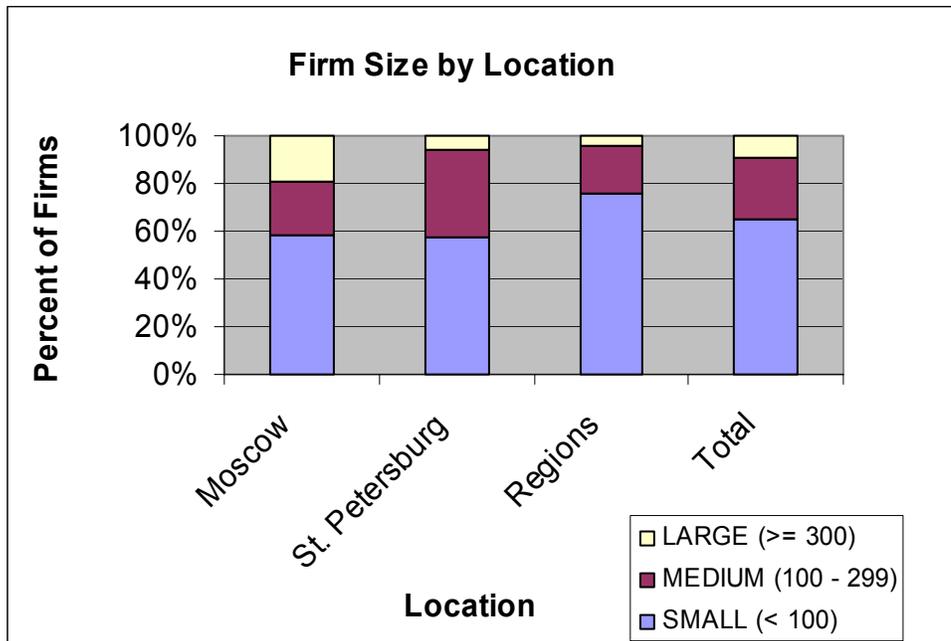


Figure 1: Firm Size by Location (n=112)

Whereas both Moscow and St. Petersburg have about the same percentage (60%) of small firms, most of the rest in St. Petersburg are medium sized while the large/medium split in Moscow is about even. A few large firms are found in Novosibirsk (grouped with “the regions” here), but for the most part firms outside Moscow and St. Petersburg are smaller. Firms are also quite evenly divided by annual revenue (Figure 2). More of the firms with the highest revenues tend to be located in Moscow. These data suggest that the industry is currently skewed towards small firms and that growth is a critical issue. Absent a lot of consolidation, movement from one revenue/size category to the next will proceed at a deliberate pace.

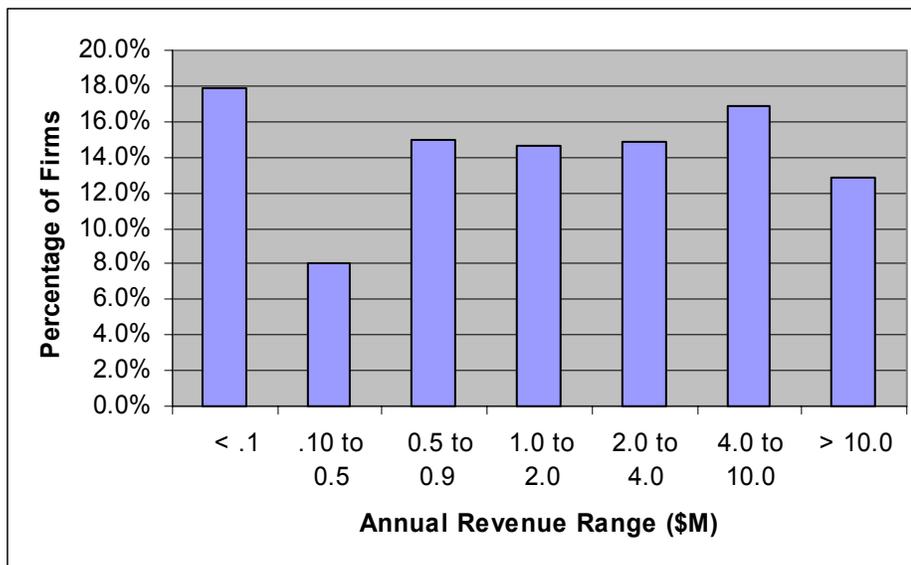


Figure 2: Inferred Revenue Structure of Russian Offshore Software Firms

Note: Based on data in [18] and [37]. Because these data were collected at slightly different times, this chart should be considered representative.

Not surprisingly, the main activity of these firms was to sell custom development services, which was the exclusive goal of 66.6% of firms in the Market-Visio survey. Another fourth also developed packaged software [48]. The Outsourcing-Russia.com survey also found that about 2/5ths of firms were developing or selling packaged software. About the same number of firms in the latter survey were doing IT-consulting and systems integration [37]. Thus, rather than sticking to a coding-to-specifications, low-end model, many firms were already trying to move up the value chain either with products or expanded services.

In its 2002 survey, Market-Visio/EDC found that about 25% of the business is for offshore development centers in Russia [48], while this percentage was 19.4% in 2003 [37]. Well known firms such as Intel, Sun, Nortel, Motorola and others have Offshore Development Centers in Russia.

Who are the offshore customers of Russian IT firms? Nine of our companies focused on IT technology firms, with eight of these emphasizing software companies such as SAP, Brio, Motorola, and Microsoft and the other one selling mostly to IT-consulting firms. Our sample in-

cluded two firms that had the business end-users of software (i.e., “non-IT”) as their primary customer type. Luxoft, for instance, developed Dell’s systems for European-based online sales and supply chain management and has completed over 70 projects in different areas for Boeing, primarily in commercial aviation. Three firms in our sample had no particular emphasis towards selling to IT versus non-IT firms. Aplana, for instance, has developed applications for firms such as Procter & Gamble and GE Medical Systems, but also works extensively with software companies such as Relavis and Systran. Most of the 14 sampled firms had both IT and non-IT firms as customers. The types of clients emphasized by firms in our sample mirror those reported in the Outsourcing-Russia.com survey, in which 74% of surveyed customers were IT firms (50% software development, 15% IT-consulting and 9% “other” IT) and 26% were non-IT firms [37]. The focus of the Russian IT industry has been on technology firms that often place demanding requirements on the Russian engineers for scientific knowledge or advanced computer science/software engineering skills, although sales to non-IT firms has also been an important segment.

The 2003 Outsourcing-Russia.com survey shows that Russian firms were specializing in a diverse range of application areas, including enterprise resource management, electronic commerce, content and document management, information and data management, information access and delivery, and networking software [37]. The industry does not have as much specialization in vertical market segments. The depth of expertise in all modern software packages is evident from websites and was confirmed as we probed about specific skills in some of our interviews.

## **Domestic Input Factors**

In this section we discuss the domestic input factors within the SESM/OM that have a direct bearing on the firm: human capital in the form of programmers and their capabilities; wages; and infrastructure. Then we turn to the financial capital and industry factors that are aiding or inhibiting the growth of the firms themselves.

### ***Human Capital***

In order to understand the potential of the Russian offshore industry, we begin by examining the programmers themselves. It was here that our interviews yielded the greatest insights, as we tried to elicit both positive and negative stories about how the Russians have worked with their clients.

### **Who are the Russian Programmers?**

The Russian software industry employed about 70,000 programmers as a whole in 2003 [47]. Based on our own compilation of data from firm descriptions on industry association websites, firm websites, and other compilations, we believe an “upper-end” estimate of the number of employees in the offshore firms to be about 6,900 in Moscow, 4,100 in St. Petersburg, and 3,600 elsewhere, although it is impossible to verify that some high numbers (such as 1,300 for

Novosibirsk State University) should really be counted within the industry. This total of about 15,000 programmers is consistent with the structure of the Russian IT industry, where about 25% of software revenues come from offshore work.

Many Russian programmers have Master's degrees and strong training in mathematics and the sciences [26]. They are said to have a deep ability to solve problems of considerable technical complexity, including creating innovative algorithms and applying scientific knowledge [51, 52]. The Russians frequently cite the first and top placement of Russian programming teams in yearly ACM competitions as evidence of the superior skills of the best Russian programmers [47].

During the chaotic 1990s the educational sector was able to maintain its performance, with the addition of many new private higher educational institutions. Emphasis continued to be on science and engineering models. A recently released report by Auriga Research found that "the number of IT graduates with Master's degrees in Computer Science or with software engineering majors will amount to 68,126 people, up 6.9% from 2003." To these, Auriga adds other engineering graduates and others who have programming training that is more extensive or comparable to three months courses that allow Indian programmers to seek employment, and finds that more than 200,000 potential programmers will enter the job market in 2004 (Table 3) [5]. Almost all of the respondents for our study praised the continuing performance of the educational sector and highlighted this as a key advantage of Russia. In a recent survey, 85% of Russian CIOs were highly satisfied with the educational system [7]. However, some in the IT industry have argued that there is a need for programmers with more "mass market" skills. As of 2002, no higher educational institutions in Russia used the complete ACM or IEEE model curricula for computer science or MIS training, leading some to argue that Russia is not producing enough people with practical, teamwork, and mainstream programming skills [34, 51]. On balance, it is thought that these skills can be learned on the job, whereas the deep scientific training that leads to deep analysis and understanding of problems cannot.

Table 3: Russian Potential Fresh IT Labor Supply

Discipline	School Year	
	2002-2003	2003-2004
IT engineering (Computer Science, Electronics, Telecom) graduates	42,138	45,994
Math and physics graduates	21,577	22,132
Non-IT engineering graduates capable of entering IT workforce	69,072	76,435
Other disciplines capable of entering IT workforce	70,631	81,270
Total fresh IT labor supply	203,418	225,831

Source: [5]

Educational institutions are seeing themselves more as partners with these firms than they may have in the past. The firms are sponsoring professorships, paying for additional classes in specific programming areas for students, hosting interns, and sponsoring the ACM programming competition teams, among other measures. Many of the firms in our sample recruit from local

universities. The desire to get higher degrees is enhanced by the need for programmers to stay in school long enough to avoid the draft [26].

English skills have also been improving. In two of our firms, English is described as the office or corporate language. Five firms claimed very high rates of reading and writing with 25-30% fully fluent in English. A number of firms provide subsidies for classes or bring teachers in and hold regularly scheduled classes for employees.

### **What quality of work do they do?**

Our research generally confirmed that Russian programmers themselves are very good. One of the client firms we interviewed, for example, used the number of bug reports in the releases as a prime quality metric for everyone's work in the firm, including the Russians'. Over the course of 20 projects they found that the Russians' work was no better and no worse than that of the other very good programmers in the firm. The Aberdeen survey also noted a "growing consensus view of Russian engineers as being technology problem-solvers rather than simply low cost programmers" [24, p.18]. Several respondents told us that the Russians fixed mistakes in specifications when they found them or were able to create systems from quite limited specifications. One client with whom we spoke gave the same specifications to a Chinese firm and to a Russian firm as a trial. Although more expensive and taking longer, the Russian results were of uniformly high quality, needing few revisions, and demonstrated strong knowledge of UML and building extensible object-oriented systems.

Project management has been more problematical. Perceptions of poor quality of Russian software stem partly from a McKinsey Quarterly report of 2001 that placed Russia in the bottom of the low quality-low cost quadrant [1], and a Gartner Group analysis in the same year that rated Russia as "poor" in process quality. In a Finnish market survey in 2003, 47% of the companies polled thought that lack of qualified project managers was a significant barrier, while 46% said the same about immaturity of software development processes in Russian firms [3]. The 2002 Market-Visio survey also found lack of project managers to be a significant barrier (47%), although maturity of processes only concerned 23% of respondents [18].

However, the 2003 Aberdeen survey showed a high degree of satisfaction amongst surveyed clients when asked to rate Russian IT firms on nine dimensions of performance. Between 88% to 96% percent of respondents on these dimensions reported being either "satisfied" or "highly satisfied." Ranked in approximate order by percentage where more than 50% were "highly satisfied" were these areas: Schedules; Project Complexity; Quality; Account Management; Project Management; Communication; and Creativity. Only Business Continuity and Security/IPR had "highly satisfied" percentages of less than 50% [24] and had any dissatisfaction being reported (2% each).

We saw some evidence of weak project management skills. In several interviews, it was reported that the Western side ensured good work by keeping very careful watch on schedules and examining code on a daily basis. Several times it was reported that Russian programmers needed to understand how Americans view deadlines.<sup>2</sup> One firm decided it was necessary to

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<sup>2</sup> For example, a Russian will say he will do something now, satisfying the client. But the Russian word is "seychas," which can mean anything from a few minutes to a few days.

bring their own manager on site in Moscow, who then found that the code that had been reported as well on the way was actually “pie in the sky.”<sup>3</sup> One of our Russian firms in the regions did not seem to want to take responsibility for ensuring better project management<sup>4</sup>—while another recognized project management as a big weakness and was sending programmers to Moscow for short (3-4 week) courses.

We found examples where poor project management resulted in programmers’ creativity causing problems. In several cases programmers delayed turning over their part of the project because they wanted to make it perfect; one project manager wanted to totally redesign the system rather than patching it, leading to unacceptable delays and termination of the project. In another case a team was given specifications for a next generation product from two different sales teams in the client’s firms, one of which required a thin-client solution with no applets and the other which required a full-blown client/server solution. This team “solved” the problem by choosing the one path that was not excluded by either side, writing a massive JavaScript application that provided full client/server functionality in a browser window but downloaded and executed very slowly. As our respondent told us, “The Russians will hack away at a problem until they solve it.” In this case, the problems were resolved once someone was appointed to oversee the architecture. Finally, one manager colorfully described the tendency of some Russian programmers to enjoy sophistication at the expense of cost-effectiveness in terms of “designing a gun to kill a fly instead of using a newspaper.”

Our discussions with firms suggests that these problems related to project management are indicative of an industry going through a normal learning process. For example, the question of being on-time/on-budget was a relative one for some of our respondents that depended on what could be negotiated with the client as the project progressed. A successful project was one in which the client was satisfied with the end result, and especially, one where the client became a repeat customer.<sup>5</sup> Respondents usually reported implementing corrective measures that, when taken as a whole, should result in improved project management and system development processes. Leading firms have already gone a long way in remedying these problems, with many other firms not far behind. Almost all firms in our sample either have recently achieved or are seeking some sort of quality (ISO and CMM) certification. This and the high levels of satisfaction reported in the Aberdeen survey [24] suggest that the industry’s reputation for poor project management is becoming out-of-synch with the reality found in many firms. In short, we believe that there is outstanding depth of knowledge available in the leading firms, and that as a whole the industry is going through a normal learning curve, with careful management highly advised.

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<sup>3</sup> One Western manager of Russian programmers thought that they are more likely to avoid revealing schedule slippages than Western programmers because, in contrast to the bad things happening in the environment around them, slippages just don’t seem important. See [49] for an examination of this question from the viewpoint of individualistic and collective cultures.

<sup>4</sup> Quoting from the interview, “if customer wants it to be managed the way he wants it he must send his manager to [our city] and he may work [here], as far as us, we haven’t such a problem, because most Western customers are not so organized and manageable as well.”

<sup>5</sup> The types of project failures that our respondent firms reported to us included: Client changed the specifications too often; Client had permanent changes in business processes that caused problems at product acceptance stage; and Client was unable to write correct or sufficiently detailed specifications. Another said: “I don’t think we’ve had such experience [of failures] from our side.” “Sometimes a customer decides to cancel, and I suppose this could be considered a failure, but it’s not because of anything this firm has done,” another related. These all reflect lack of experience and typical programmer attitudes more than anything else.

## *Wages*

Virtually everyone in our survey said wages are rising in Moscow and St. Petersburg, that the IT labor market is becoming more competitive there, and that one source of competition is the internal IT market. A 2002 survey [48] reported the average monthly wages for development staff ranged from \$500-1,600 in Moscow, \$400-1,300 in St. Petersburg and \$300-850 in the regions. Since the “regions” included cities with major development centers such as Novosibirsk and Nizhniy Novgorod, it is likely that many smaller regional cities fell into the lower end of the \$300-850 range. The Outsourcing-Russia.com survey in 2003 found that programmer wages ranged from \$380 to \$1,200 and manager wages from \$700 to \$1,900, with unspecified higher levels in Moscow<sup>6</sup> [37]. Our respondents reported everything from \$150 per month to \$3,000 and even \$5,000 per month for the very highest qualified project managers.

We got the impression that if current trends continue, the industry will be able to compete on price against India and other rising countries only if it is able to shift development work to the regions by setting by hiring programmers outside of the three major centers or bringing them to the major cities. Luxoft, for instance, set up a development center in Dubna for this reason, EPAM has a center in Omsk, and Auriga has a center in Kazan’. (DataArt, on the other hand, discontinued its center in Perm’ because communications were too expensive, preferring the closer Novgorod.) An additional benefit of doing this was that turnover in the regions may be less of a problem where relatively fewer opportunities for employment exist. It may be difficult, however, to persuade Moscow or St. Petersburg personnel to take temporary positions in the regions to help bring programming groups there up to speed.

Evidence about quality of life issues in our interviews was indirect. A number of firms provide health care benefits and various forms of tax relief, as well as social services. The range and quality of these measures at some of the firms suggest a maturation of understanding of human resources issues. Several respondents asserted that most of the Russians who have wanted to emigrate have done so, indicating that those who have stayed are reasonably well satisfied with their lives. Auriga, Luxoft and several other firms claim very low turnover rates (e.g. 5% for Luxoft vs. 10% for the IT industry as a whole). While low turnover reflects job satisfaction, it also reflects risk aversion after a decade of relative economic chaos.

## *Infrastructure*

Infrastructure can mean a variety of things, ranging from something as direct as the presence of Internet Service Providers to something as indirect as the existence of available housing in a city. In general our respondents did not cite infrastructure elements as major hindrances in their business—they serve more to cause annoyances rather than presenting serious impediments to growth.

Although it has diminished, the backlog in physical telephone lines from the state-maintained network in Russia remains at about five years [33]. Businesses in larger cities, how-

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<sup>6</sup> It makes the curious statement that “due to the fact that the top companies are from Saint-Petersburg, Novosibirsk and Nizhniy Novgorod this difference is not so significant.” We doubt the Moscow firms would agree with this, and the authors seem to not want to reveal Moscow prices in order to maintain the impression that Russia is a lower cost provider.

ever, can bypass this problem through use of commercial telecommunications companies such as Golden Telecom, Peterstar and Comstar that provide quick set up and high quality service for a price that isn't "prohibitively expensive." Additionally, cellular service is widely available throughout the country with penetration rates that rose from 1.7% in 2000 to 24% of the population by the end of 2003 [31].

Affordable, high-speed Internet access was not reported as a problem by any of our respondents. Internet access by employees outside of the office however could be problematical. Only two percent of the population had broadband access in early 2003 [33] which would normally result in the use of the relatively poor quality state-maintained telephone network. One firm in a more remote Siberian location, for instance, reported that programmers working at home preferred night, when the Internet connections worked better.

Some infrastructure problems besides telecommunications may exist. One of our respondents told us that it is difficult to find nearby office space to accommodate growth, but there is no desire to move everyone to a completely new place. Construction of modern, flexible office space has just begun during the past decade, with many firms needing to make do by retrofitting Soviet or pre-Soviet era buildings. When security costs are included, office space can be expensive. However, commercial real estate agents and other intermediaries are appearing that are simplifying processes related to space and infrastructure provision.

Another of our respondents spoke of the difficulty of traveling to some of the remote cities, which makes bringing clients in more difficult. Although flight availability may not be a problem to the larger remote cities, flights to destinations other than Moscow or St. Petersburg often require traveling on domestic airlines that have broken off Aeroflot or that have sprung up in the last few years—these airlines are sometimes viewed as having suspect quality.

### ***Size, Investments and Mergers***

The relatively small size (Figure 1) of most Russian offshore firms has been a hindrance to winning large contracts [22]. While several of the firms we spoke with indicated they are satisfied with their rates of growth, others said that they are looking for acquisitions or are lacking in capital to grow. We believe their size is a function of four forces: the absence of capital and use of self-financing to grow; the size and distribution of firms in the Russian economy; firms' fears of not sustaining enough business for larger work forces; and the unwillingness to merge which results partially from desire for control and partially from a lack of knowledge about financial markets.

The small software firms have had little choice but to use self-financing to grow. Banks have been reluctant to make loans, a great deal of capital has "flown" abroad, venture capital funds remain a nascent industry, and the Russian economy has lacked either large or medium-sized firms that were interested in or able to grow by making acquisitions of smaller firms. The "slots" of middle-sized firms that would ordinarily play this role in the economy have been taken in Russia by moribund holdovers from Soviet times with neither the capital nor interest to explore acquisitions [43]. We found just one counter example: In 2000, the "Factor" company, based on non-ferrous metals, was poised to make a \$22M dollar investment in a group of software companies in Novosibirsk. The downturn in the global IT market halted this plan [27].

Some venture capital help has come from aboard, including a \$12M investment by the International Finance Company in Russia's largest IT company "Information Business Systems," which is also the parent of Luxoft [55]. This gives Luxoft extra funds to draw on when needed, although it is still primarily oriented to growth through self-financing. IFC has made and plans to make other investments, and several other examples of a few million dollars each can be found. [21, 35]. At present there seem to be two venture funds that are oriented towards IT: Quadriga Capital Fund and Baring Vostok Private Equity Fund [4].

Firms are reluctant to merge because they do not want to give up control of entities they have worked so hard to create [25] or because they think their firms are worth more than they are offered. The relative shakiness of the financial health of smaller firms that depend on a fluctuating number of clients means that they do not appear to be attractive takeover targets for larger firms. This same shakiness means they themselves do not want to take on the complexities of hiring a larger staff. Several of the firms we spoke with do plan further acquisitions, and some have ambitious growth targets ranging from 60-70% to 100% for the next few years. Luxoft, for example, wants to reach 1,500 by the end of 2005, and EPAM also plans to breach the 1,000 employee mark.

## Linkages

In this section, we discuss key aspects of linkages identified by Heeks/Nicholson [17] and Carmel [9]. First is quality certification, which serves as an additional indicator of the maturity of human capital, and is an important marketing tool and means to forge linkages. Second are marketing techniques and knowledge more generally. Finally, trust is a factor, with concerns over software piracy being mentioned in particular.

### *Quality Certification*

According to many of our respondents, certification was the most important way to gain credibility with foreign customers, and the Software Engineering Institute's Capability Maturity Model (CMM) was more important than ISO. Large scale project management skills were less frequently mentioned as important, while the use of software tool suites was not considered important.

Table 4 shows how many firms have achieved both ISO and CMM certifications according to surveys and our own compilation of data. Most firms that announced intentions to receive ISO certification did so, but this was not true for CMM. At least one of our respondents suggested that ISO is also a valuable credential on the domestic IT market, although others thought not. Globally ISO is less likely to be a competitive differentiator [6]. Intentions that many firms would receive CMM continued to be announced, with RUSOFT saying that, of 29 firms seeking CMM certification, 15 would finish by the end of 2003 [41]. In practice it was eight (Table 5).<sup>7</sup>

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<sup>7</sup> This may be in part a result of optimistic self-promotion as well as the fact that most Russian IT firms are relatively small. The average number of employees in the sampled firms that had one or more of the CMM certifications was 358 employees versus 13 employees for firms without any CMM certification.

There has been considerable debate about the value of achieving CMM certification among the Russian outsourcing firms. Some of our respondents noted that they experienced productivity and/or quality increases or increased stability once they achieved Levels 4 or 5. Some felt that it is a necessity to get onto the approved vendor lists of major Western customers such as Colgate-Palmolive (biggest client of EPAM) or Boeing (biggest client of Luxoft). This tended to be the case for firms that targeted the end-user/non-IT company, or when customers were large technology firms, such as Motorola, that tended to require such certification.

Some Russian firms without CMM certification targeted client firms for whom CMM type processes would be too cumbersome in any case. Others emphasized smaller and mid-sized technology companies that were comfortable working with a Russian firm that lacked CMM certification. Several respondents in this situation noted that direct communication between engineers of client and vendor firms provided assurances that substituted for CMM-provided credentials. The Aberdeen Group's study made a similar conclusion that technology firms rely less on the assurance provided by a vendor's CMM or ISO status [24]. eDevelopers promotes its own 7-stage quality assurance process, although it is not yet planning to seek certification.

Table 4: Planned and Actual Certifications of Russian Outsourcing Firms

Source	Firms with Stated Type of Certification	2001	2002	2003	2004 and Beyond
		HAVE	Planned	Planned	
Market-Visio/EDC Survey, end of 2001, n = 70	ISO Percentage	12.9%	37.1%	22.6%	
	ISO Imputed Number	8	23	14	
	CMM Percentage	1.6%	25.8%	29.0%	
	CMM Imputed Number	1	18	20	
2003 Outsourcing Survey by Outsourcing-Russia.com, n = 30				HAVE	Planned
	ISO Percentage			26.0%	32.0%
	ISO Imputed Number			8	9
	CMM Percentage			9.0%	35.0%
				3	11
Authors' compilation from websites, etc., n = 125				HAVE	Planned
	ISO Percentage			26.4%	1.6%
	ISO Number			33	2
	CMM Percentage			6.4%	4.0%
				8	5

Sources: [37, 48], Authors' interviews and compilation

Knowledge about world quality standards such as CMM did not appear in Russia until about 2000 [6]. Training courses for CMM started in 2001 [59], and quality seminars sponsored by the UN Development program and Ministry of Science through RUSOFT were held [45]. In all, this program provided \$150,000, which helped two firms receive certification by the end of 2002. In 2002 a complete CMM Handbook was translated into Russian and placed on the web [46]. In Summer 2003 a project was initiated called ICT-Connector that planned to make funding from the Finnish government available through a program administered jointly through Finpro

and the International Finance Corporation’s Technical Assistance programs in Russia. The ICT-Connector project announced goals of training 3-4 authorized CMM assessor firms, training 50-60 Russian companies on 2-3 selected topics, and helping 10-15 Russian companies to partner with Finnish counterparts [2]. In conjunction with this effort “Days of Software Quality Assurance” were held in St. Petersburg in Sept. 2003, which also marked the creation of a St. Petersburg branch of the Software Quality Institute. 28 companies joined this immediately [6]. While certification can be expensive with direct and indirect costs up to \$170,000 [2], large St. Petersburg firms found this less of an issue at the end of 2003 [4]. Firms like Motorola have been proactive in helping other firms address quality issues. The ICT-Connector program has now started training for about 40 CMM lead assessors. The process is considered slow and financing inadequate, however, so indigenous assessment may be some way off. Three to six companies may be certified in 2004 [4].

Table 5: Russian Outsourcing Firms with CMM Certification as of Dec. 2003

Software Firm	CMM		CMMi		
	3	5	3	4	5
Digital Design			x		
EPAM Systems				x	
E-Style Software House			x		
HitSoft	x				
LUXOFT		x			x
STAR Software	x				
Telma Ltd		x			
Motorola Global Software Group-Russia		x			

Thus, since the first benchmarks of the Russian industry were performed in 2000-2001, a number of firms have achieved certification, but there still remains a gap between what has been announced and what has actually been accomplished.

### ***Marketing Knowledge***

One of our client respondents told us that when investigating St. Petersburg in 1999, he found an attitude among most of the outsourcing firms that unless a client was approaching them with funds in hand, he was not worth talking to. Since then the industry has woken up to the necessity of marketing itself. The chief means have been exhibitions, traveling trade shows, short term trips to win business rather than investing in a full-time marketing staff in country, public relations through consulting firms and press, and small investments in advertising, web sites, and

search engines.<sup>8</sup> While some of the firms we investigated had excellent web sites, others (from the regions) had broken links or barely made it known that they wanted outsourcing work.

One of our client respondents disparaged the reliance on short-term trips (you can't get a year's worth of business in 2-4 weeks!), but most firms now have or will soon have permanent representation in at least one foreign country. Within the 31-company sample of the 2003 Outsourcing survey, 19% of firms had foreign sales offices in the USA or Canada with technical personnel in 2002, to rise to 39% in 2004. 13% had sales offices without technical personnel (to drop to 10%); 35% had a partner company (rising to 39%), 19% had a commercial agent (rising to 26%), and 26% had no representative (to drop to 7%) [37]. All firms in our sample also used at least one of these methods. Some firm respondents related difficulty finding suitable agents, and some members of the Russian diaspora who are coming into this role from technical backgrounds may also lack requisite marketing knowledge.

Almost all top managers of the firms in our sample are scientists or engineers by background. This was mentioned by a number of respondents as a problem although few specific difficulties that arose from it were cited. One US customer noted for instance that the Russian IT industry is not very good in customer relationship management and that he chose to work with a firm whose international sales director was a non-Russian with extensive sales experience both outside of IT and outside of Russia. One of the firms we interview had an international sales director who did not speak any foreign languages at all.

Another marketing problem is overcoming negative perceptions of Russia. One of our client respondents felt such an effect from negative publicity about Russia that he is now circumspect about his use of Russians and offers Indians as an alternative to some clients. A Russian firm's president also said that the biggest hindrance is the perception that "Russia is a country that is falling apart." One of our Russian firms found that non-IT firms will not seriously consider Russians whereas IT firms are much more open to that proposition.

### ***Trust – Software Piracy***

Trust was mentioned as an important barrier to using Russia firms in a number of surveys [e.g. [18, 48]]. Although Russia has strong anti-piracy/copyright protection laws, lax enforcement results in significant use of pirated packaged software, though firms in our sample claimed not to do this. Concern over potential intellectual property loss was almost totally absent in our interviews. One Russian firm, for instance, noted that while software piracy continues to be a significant problem in Russia, outsourcing firms are very careful with software developed for clients since a single breach of trust could spell disaster for a firm's future. This is consistent with the Aberdeen report that that "there have not been any reported incidences of intellectual property theft by offshore service providers in India, Russia or China" [24, p. 19].

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<sup>8</sup> One firm claims knowledge of how to ensure high placement in Google. Using the words "software development company" (no quotes), seven offshore firms came up in the top ten in early Jan. 2004, in order by country: Russia, Russia, Belarus, skip, Belarus, skip, India, skip, Pakistan, Russia! In the second 10 there are five Indian firms, 2 Russian, and 2 Ukrainian.

## **Government and Association Support**

The final key element of the SESM and OM is the foundation of national and association support for the development of the software export industry.

A July, 2003 poll of 36 leading figures in the Russian IT industry found that, on a scale of 1 = very poor to 5 = outstanding, state support for offshore programming got the worst score of 2.00, followed by 2.3 for laws, and 3.3 for infrastructure [7]. Preliminary results for a 2004 industry survey rated government support as “bad” [11], and the outcry about lack of support is becoming more strident [15]. Some of our firm respondents thought the Russian government should be doing much more, while others wanted to be left alone.

### ***Direct Governmental Support***

A Digital Design press release in Jan. 23, 2003 proclaimed: “President of Russia Vladimir Putin defined the development of the information-communication technologies as a strategic direction and one of the drivers of the recovering economic situation in the country. The Federal targeted program ‘Electronic Russia’ has as one of its goals increasing the export of software from Russia to \$1.5-2B by 2010...” [10]. In fact, this goal is certainly not an integral part of the E-Russia program, and the funds allocated to achieve it are miniscule (Table 6). With the exception of the Electronic Moscow {E-Moscow) program, we have not found any prominent government statements or programs that provide direct assistance to the offshore programming industry. In the case of E-Russia there has been a tender to four companies, possibly for a database related to these activities [19], and another tender to a consortium of RUSSOFT, Fort-Ross, and others to support analysis and carrying out of marketing and exhibition activities in 2003-2004 [56]. The maximum that could be spent in 2003 was \$100,000 [29]. Our firm respondents did not expect much from E-Russia, and most did not seem to know much about it.

The most wide-ranging and serious discussion of offshore programming is contained in the E-Moscow program, approved in May, 2003. “Considering the relatively small capitalization, the presence in Moscow of a large quantity of first-class specialists, promising developments, and also the possibility of quick returns, it seems wise to transform the production of software into one of the priority directions of industry and investment policy of the government of Moscow.” [20, p. 96]. Consequently, the program tasks include: creating positive conditions for offshore programming, including venture capital and investment support; helping match orders of foreign firms with Moscow firms; developing integrated measures to aid sale of “boxed” software; and advancing open source software created by domestic programmers, including for operating systems.

Table 6: National and Municipal Programs and Offshore Support

Program	Basic Parameters	Support for Offshore Programming	Percentage of Total Budget of Listed Program
Electronic Russia	2002-2009, \$2.7B, to promote informatization of government and society	2002-2004 funding levels at 20-25% of planned; measure including offshore support has \$55,000 per year at full funding	0.47%
Electronic St. Petersburg	2002-2006, \$157M, similar goals to E-Russia	Somewhat more explicit support for international development of ICT cooperation, about \$250-350,000 per year	0.53%
Electronic Moscow	2003-2007, \$663.5M for very broad goals of transforming Moscow in information society	Specific support for offshore industry of \$15M	2.30%
Electronic Novosibirsk	2002-2006, highly focused on governmental informatization	No explicit support for offshore industry	0.00%

Sources: [20, 36, 39, 44, 50]

The program envisions spending \$66,666 in 2004 for planning needed support measures. In addition, \$2.3M in 2004, \$5M in 2005 and 2006, and \$2.6M in 2007 for a total of \$15M from the budget, with \$23.3M to be attracted from non-budget (private) sources over that time frame, is to be spent for their realization. About one million dollars are also allocated from the budget for fighting software piracy [30]. The overall city budgetary portion of E-Moscow totals \$665M, so the proportion allocated to offshore programming directly is about 2.3%, which is an order of magnitude more than is present in either the E-Russia or E-St. Petersburg programs. It is difficult to predict the complementary effects of all the rest of this investment, which may improve the infrastructure, on the one hand, but increase demand for programmers and drive up their cost, at least in Moscow, on the other. One of our respondents was aware of the support being offered by Mayor Luzhkov for the IT industry in Moscow and praised it.

### ***Laws and Legislation***

There have been considerable simplifications of tax laws in recent years, but the total tax burden from local, regional, and state sources remains high. Interest, advertising, and training are not deductible expenses for tax purposes [53]. All three of these could have a significant effect: Interest—on the ability to leverage capital for growth; advertising—on the ability to carry out much-needed marketing activities; and training—on the ability to invest in programs such as ISO and CMM.

Labor and tax laws push firms to keep two sets of books. One of our respondents spoke directly about the need to keep two sets of books, one “for the tax man” that said programmer wages were in the \$200-300 range, and one for themselves, with real wages being \$600-800.

Paying higher salaries is complicated by the labor law restrictions that define maximum pay levels in terms of a multiple of the minimum livable salary. This has had the practical effect of causing Russians to form multiple smaller companies in which they can simultaneously hold positions and be paid. Portions of wage funds are often funneled through a third country, with employees receiving them on plastic debit cards. Software exporters still have to pay the Value Added Tax and go through a cumbersome process to have it be refunded. While some firms want to pay all their taxes, others feel that paying taxes will lead to greater scrutiny, which could lead to other forms of trouble. The potential and real arbitrariness of government officials is an additional cost of business in Russia.

Leningrad Oblast' (the region including St. Petersburg) has granted some tax breaks to software exporters [4], and in 2001, the Russian government discussed creating tax free zones for IT development. In 2002 it backed away from any such changes in "the near future" [53]. The subject of tax free zones is, in essence, a political hot potato, because of their use by the oligarchs in the 1990s to launder and move money offshore [58]. Members of the offshore community have argued against getting tax breaks because they will only attract criminal elements [55].

Technoparks have been proposed to give comprehensive support to new firms. Many exist on paper, including some on the campuses of universities. One of our respondents is located in one. As he put it, the decree has been signed, "but how this translates into dollars is unclear." Another respondent hailed support by Moscow Mayor Luzhkov for technoparks in Moscow. A proposal to create a technopark in Tomsk looked good until it was set aside due to the campaign for governor of the region.

Under the E-Russia program, a package of changes in laws to support the IT industry is under development [44], although none announced so far seem to deal directly with the offshore software industry. The Russian IT sector is interested in customs reforms that do not wind up delaying arrival of specialized hardware or increasing its price, an effect it claims has stunted and/or reversed in Russia the worldwide trend towards cheaper IT prices [57]. One respondent noted that "getting new kinds of hardware through customs can be a challenge, so we have to work a lot on getting what we need through at times." Finally, simplified rules for visitors to come to Russia and for them to go to other countries would be helpful, but is unlikely to happen any time soon due to security concerns.

### ***Role of Associations***

In 2001 the American Chamber of Commerce's Whitepaper on Offshore Software Development in Russia noted that lack of an industry organization was a weakness:

"NASSCOM, the Indian association of companies involved in offshore software development has been instrumental in lobbying the Indian government for favorable tax and regulatory changes. It also undertook campaigns to promote India throughout the world. Most importantly for the clients of these Indian member firms, it organized an industry effort to improve software development quality and business processes in India" [53, p.14].

Table 7 below shows eight IT industry associations and consortiums that have emerged within Russia during the past few years.

RUSSOFT and Fort-Ross may be the more significant players among these associations. Collectively, their membership lists include most of the middle to larger sized Russian offshore outsourcing firms, especially for firms located in Moscow and St. Petersburg. Membership lists of the National Software Development Alliance and Inforus, on the other hand are dominated by small to mid-size Russian IT firms. VARITA's main purpose is to provide a centralized location for collecting, disseminating and providing links to industry information. Since VARITA's main purpose is informational, it is doubtful that it can leverage all the associations as if one NASS-COM existed. The Aberdeen report summarizes this situation by stating "whether or not the collective goals and objectives of these organizations can be best accomplished individually or through some sort of consolidation remains to be seen" [24 , p.18].

Fort-Ross also tries to interact with prospective customers to get orders, and then distribute the work to member firms, including the possibility of joint contracts, although mechanisms for doing this are not necessarily clear, and one of our respondents noted that "joint projects aren't done much." Another indicated that in a few cases other Fort-Ross members were used to handle tasks that required specific specialized skills. Fort-Ross, however, was not involved in obtaining these contracts. Finally, one non-Fort Ross respondent perceived that Fort-Ross had become primarily a promotional organization in the past few years.

RUSSOFT and Fort-Ross in particular provide a presence at many IT and outsourcing conventions and trade fairs and other events for raising awareness and creating a positive view of the Russian offshore outsourcing industry. RUSSOFT and Fort-Ross have jointly put on a number of "road shows" for prospective clients in recent years in their main offshore markets. Fort-Ross has put on Software Outsourcing Summit in St. Petersburg every June since 2001 to promote the industry to potential customers and investors. Finally, the associations are also involved in helping to improve the management and quality practices by arranging for educational events, workshops and short courses and are involved in some aspects of the ICT Connector project.

RUSSOFT lobbying has apparently been responsible for at least one change in tax policy [21]. The Russian government, however, has been relatively unresponsive to lobbying. One respondent noted that until the industry achieves a large enough size, that the government will probably fail to give it much attention. The director of the ICT Connector project feels that the AP KIT Association, representing about \$2B and 70% of the software and hardware market as a whole, may have enough size to start being more influential [4]. Among AP KIT's goals are to lobby on behalf of the Russian IT industry with the Federal government on issues such as legal, economic and social policy, to act against monopoly and unfair competition in IT, and creating favorable financial and economic conditions for its members. Although AP KIT has been involved in some international promotion efforts, and includes "international activities and investments" among its priorities, its main focus is not the promotion of offshore outsourcing per se. Among the 61 member firms noted on their website, it includes few of the well-known Russian outsourcing firms, although it includes some well-known foreign IT firms such as Oracle, Microsoft and Hewlett-Packard.

In June, 2004, a merger between Fort-Ross and RUSSOFT was announced, to be phased in gradually over 2004.

Table 7: Russian Software and IT Associations

<b>Organization</b>	Total Members (No. in our sample)	Membership according to Outsourcing- Russia.com Survey (2003)	Principal Areas of Activity
Fort-Ross Consortium, www.fort-ross.ru	34 ( 5 )	16.1% of firms in sample	St. Petersburg and beyond, 3000 engi- neers, mechanism for joint contracts
National Software Develop- ment Association – RUS- SOFT, www.russsoft.org	49 ( 10 )	41.9% of firms in sample	Nationwide, 6000 developers, pro- motes exports, lobbies, works on qual- ity assurance
National Software Develop- ment Alliance – Silicon- Taiga, www.silicontaiga.org	117 ( 1 )	12.9% of firms in sample	Nationwide, similar goals to RUS- SOFT
Inforus, www.inforus.org	45 ( 0 )	12.9% of firms in sample	Moscow area, 2000 software engi- neers
AP KIT - Information & Computer Technologies In- dustry Association, www.apkit.ru	61 ( 0 )	-	Broader industry association for hard- ware and software; firms have 70% of market; little explicit focus on off- shore industry
VARITA: Virtual Alliance of Russian IT Associations, www.russia-software.com	6 associations	-	“To provide continuous contacts, dis- cussions and information exchange between information technology asso- ciations in Russia”
SIRIUS, www.sirius.ru	74	-	Association of systems integrators and software developers
Tomsoft, www.tomsoft.tomskinvest.ru	5 firms, 7 uni- versities (1)	-	Small regional association in Tomsk, Siberia

Sources: Websites as indicated

## Discussion and Conclusions

Over the past few years the Russian offshore industry has arisen from relative obscurity to become a viable alternative on the world market. Estimates of the recent growth rates of the industry range from 30-50% per year. Extrapolating these rates would suggest that Russia could cross the \$1B mark, and thus become a Tier 1 provider, by as early as 2006 or as late as 2009.

Our results suggest that some of Heeks and Nicholson’s 2002 assessments remain accurate, while others do not [17]. Human capital continues to be a major strength of the industry, clusters of maturing firms continue to grow around Moscow, St. Petersburg, and Novosibirsk,

financing continues to be limited, and direct government support for the industry appears to be only marginally improved.

There are a number of positive trends when compared to Heeks and Nicholson's earlier assessments. Major players have addressed quality concerns through certification and other means. The types of stories related to us indicate that doing offshore work with Russia can be quite successful and that Russian programmers do live up to their reputation. A relatively small number of firms have become thoroughly Westernized, partly through the help of the Russian diaspora, and are doing the things one would expect them to do to compete effectively. English skills are improving. While the industry does a relatively low volume of work, this work is of a "high-powered" nature that stems from the scientific and technical orientation and training of the industry.

International linkages are improving with many firms setting up offices in client countries or by working through partner companies or commercial agents. Concerns about intellectual property rights and technical infrastructure were largely absent. Although not as focused as NASSCOM, a collection of industry organizations has emerged to play a role in developing and promoting the industry. While resisting lobbying efforts for direct support, the government has created a much more stable business climate that has allowed the firms to thrive. The current boom in IT in Russia represents the fulfillment of suppressed demand as investment in the economy is finally returning. Unlike the boom of the early 1990s, when programmers focused on PCs and LANs, now the demand is coming at the level of much more sophisticated enterprise systems [32]. Russian IT firms are providing domestic outsourcing services and are starting to have to learn a stronger customer orientation [13]. The increasing breadth of the industry bodes well for growth across a much wider spectrum of offshore clients. And while the E-Russia and other "E" programs have disappointed in terms of their direct support for the industry, they are stimulating the IT industry in general. E-Moscow provides very specific, helpful goals and support. Firms have proven they can succeed without relying on governmental support.

Although there is yet much room for improvement, these results when taken as a whole indicate that the industry is making progress in addressing its shortcomings—the tangible improvements in the industry have outpaced the accepted wisdom about it (Table 8).

On the other hand, as Table 8 also demonstrates, significant areas for improvement remain. Most leading Russian firms are still too small to go after really big (global-scale) contracts, and there are hindrances and barriers to consolidation. Getting big may attract the wrong kind of governmental scrutiny. As long as most of the industry remains small, there will be relatively few firms with certifications. The industry associations, while having some success, have remained fragmented. There are questions as to whether the educational system will be able to sustain its ability in the long run to produce the right mix of students to support significant growth in the industry [51]. And the government could do far more to promote the industry by reducing tax burdens, streamlining customs, facilitating visas, and supporting technoparks, training, and marketing activities.

So there are essentially two pathways open to Russia for offshore programming, both of which may be of limited availability to other developing nations. The first is to continue emphasizing high-end work for technology firms that draws on the strong science/technical orientation of the top layer of Russian programmers. As Michael Porter has explained, "competitive advantage results from the presence of world class

Table 8: Summary of “Accepted Wisdom” Factors Assessment

<b>Heeks/Nicholson &amp; Carmel Area</b>	<b>Prior Assessments</b>	<b>Our Current Assessment (June, 2004)</b>
Linkages	Poor marketing capabilities; lack of a campaign; poor foreign representation	Representation improved greatly; marketing capabilities improving; global campaign still absent
	Difficulty of visiting Russia due to visa requirements	Still a large difficulty for both directions
	Lack of world track record; perceptions of software piracy	Piracy perception no longer a problem; still need better track record, although improving
Software Industry Characteristics	Inexperience in offshore software development; poor understanding of business practices and project management on the part of Russian software firms	Very considerable improvement
	Lack of certification organizations (and CMM certified IT firms)	Considerable improvement, although most firms too small for certification
	Offerings too narrow; too little forward-looking strategic planning	Remains problem area
Domestic Input Factors / Infrastructure	Excellence of Russia’s IT Human resources, e.g. in-depth technical skills, R&D experience, experience with complex projects	Still major plus
	Excellent education system	Still major plus
	European / Western Culture	Still a plus
	Location (near to Europe and the U.S. east coast)	Still a plus
	Low Labor Costs	Competition on cost alone becoming harder, but large savings still possible
	Poor English skills	Considerable improvement
	Bandwidth costs; deficient telephone and data communications infrastructure	No longer perceived as big problem
National Vision and Strategy	Lack of industry associations as effective as NASSCOM	Improving, but a lot more improvement needed
	Lack of meaningful support by the Federal government for the offshore industry	Still a large problem area
	Poor business environment (intellectual property protection, tax and labor laws, perceptions of corruption and instability)	Overall business environment improving, specific law reform and enforcement still needed

institutions that create specialized factors and then continually work to upgrade them” [40, p.78]. Using these strengths to sell to technology firms has been the approach taken by most firms in our sample. This strategy also is well suited to the limited resources available in most firms for growth. It is difficult to gauge what the demand is ultimately for this level of sophisticated work. It may remain as a niche, but a lucrative one if companies around the world come to rely on this as a major source of innovation rather than as a means to plug holes and reduce prices.

The second pathway is to offer a certain percentage of the programmers that are now becoming fully proficient domestically in modern business systems and business system programming. Whether or not it is their main strategy, some firms in our sample have become successful in selling to the business end user. Leading firms in this area are becoming large enough and are obtaining the needed CMM credentials so that the Russian outsourcing industry is becoming increasingly capable of competing head-to-head with Indian firms in developing business systems and business system programming. There is likely to be a broad base of these programmers available in Russia that would be attractive to Western customers. The combination of somewhat lower prices when compared to leading offshore locations such as India and Ireland, and higher knowledge and skills may be difficult to find in many other emerging offshore destinations. It is difficult to imagine most developing nations approaching both of these advantages in the near future.

Emphasizing these two pathways may take some pressure off needing to be lowest cost in all cases, which could mitigate the effects of rising wages in the major cities. As far as the lowest tier of services is concerned, Russia may play in this market by utilizing lower cost human resources in the regions (and former USSR republics), sometimes through internal outsourcing from Moscow or St. Petersburg based firms to development centers located there. But for the Russians to compete much for this broad base, low cost, high volume programming would require a mobilization of resources and will that is unlikely to emerge when 1) the industry has already oriented itself towards higher value activities, and 2) the main preoccupation of the government is natural resources.

Rather, the approach taken by the Russian IT industry is to strengthen its position with its current technology-savvy core customer base, while expanding into a full spectrum of software development services to the business user. This latter emphasis overlaps the mainstream approach taken by Indian firms, but tends to differ somewhat in that Russian firms are just beginning to achieve success in landing contracts with large corporate clients. Some have reported that Western firms are reconsidering putting all their eggs in the India basket and want some level of diversification to reduce risk. Russia looks like a good bet as a secondary source for a certain percentage of work.

With the chaos after the breakup of the USSR and the instability of the country’s early phases of capitalism, the Russian IT industry was not in a good position to compete for global outsourcing business in the 1990s as India became the pre-eminent offshore destination. Russia has now reached a “platform of maturity” that provides the potential for this industry to become a significant competitor in the global IT market against India as well as other up-and-coming locations. It seems to us that the main question is whether the Russian IT industry will succeed in

creating a brand name for itself that potential customers will recognize and understand. Although client firms ultimately contract with individual outsourcers, creating a national identity should help get its IT firms on the table for real consideration. Strong, direct governmental support could prove decisive in bringing this to fruition.

In the long run, Russia needs sources of foreign trade that do not depend on raw materials. Offshore programming can be a gateway for high-tech entrepreneurship that will really help to unlock the potential of Russian science and engineering in a way the world has never seen before. Ironically, the Soviet Union built up a tremendous edifice of science and technology, but lost its competition with the West. Through offshore supply of intellectual talent, Russia may fare much better.

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