

OFFSHORE SOFTWARE DEVELOPMENT: SURVEY RESULTS



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Researchers at the University of California, Irvine conducted a survey of U.S.-based software companies in 2008. The topic was offshore software development, including drivers and obstacles, location, performance, and management practices. This report summarizes the main findings from the survey.

Survey respondents

A telephone survey was conducted by Abt SRBI (New York) from July 29 to October 27, 2008. The respondents were selected from firms with SIC codes corresponding to software publishing and computer service companies (7371, 7372, 7373, 7375, 7379). Respondents were generally executives involved in software development. The survey resulted in 253 completed cases with a response rate of 17.1%. Another 23 cases came from a web survey conducted through the Software and Information Industry Association (SIIA) in February to March, 2008. Of the firms surveyed, 107 had no offshore development and were asked a short set of questions to compare them with the 156 firms who did have offshore development. Firms that conduct any offshore development completed the full survey. The full telephone survey took about 20 minutes to complete.

Offshore versus non-offshore companies

Using the full sample of firms, we can compare companies that have some offshore development with those that have none. Doing so, we find the following differences. Those that have offshore development have a much larger average share of revenues outside the U.S. (28% versus 8%), suggesting that offshore development is linked to firms' involvement in foreign markets.

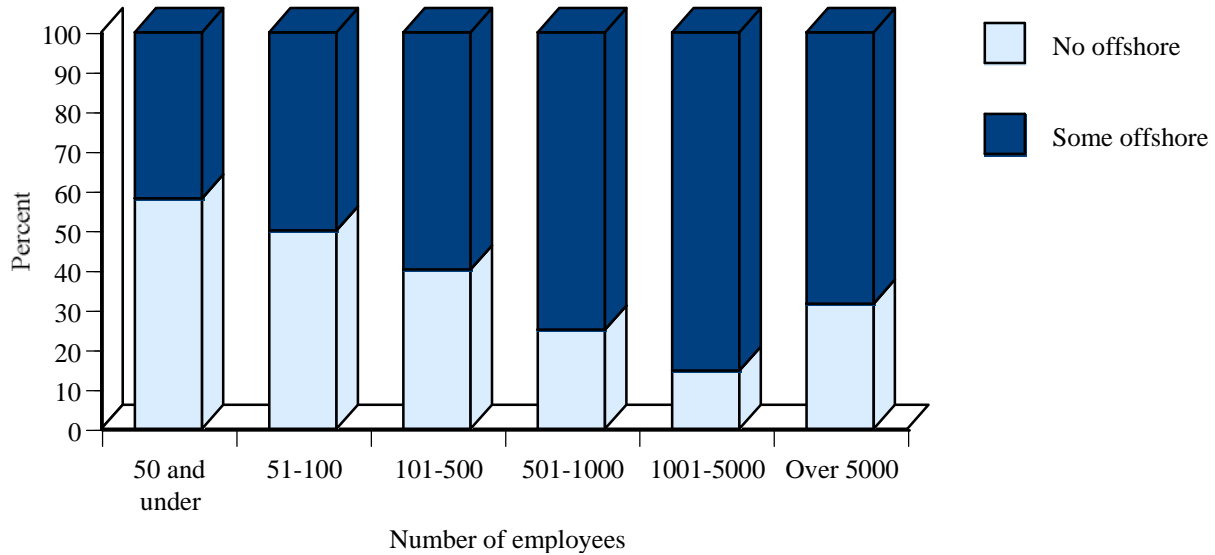
Table 1. Comparison of firms with and without offshore development

	Some offshore development activities	No offshore development activities
Number of firms	156	107
Mean percent revenue from sales outside the U.S.	28%	8%
Mean number of software developers	373	61

Firms that employ offshore development are significantly larger in terms of average number of developers (373 versus 61). Likewise, looking at firm size in terms of total employment, we find that larger firms are more likely to have offshore development than smaller ones (Figure 1). These findings suggest that offshoring is easier to implement for larger companies with more

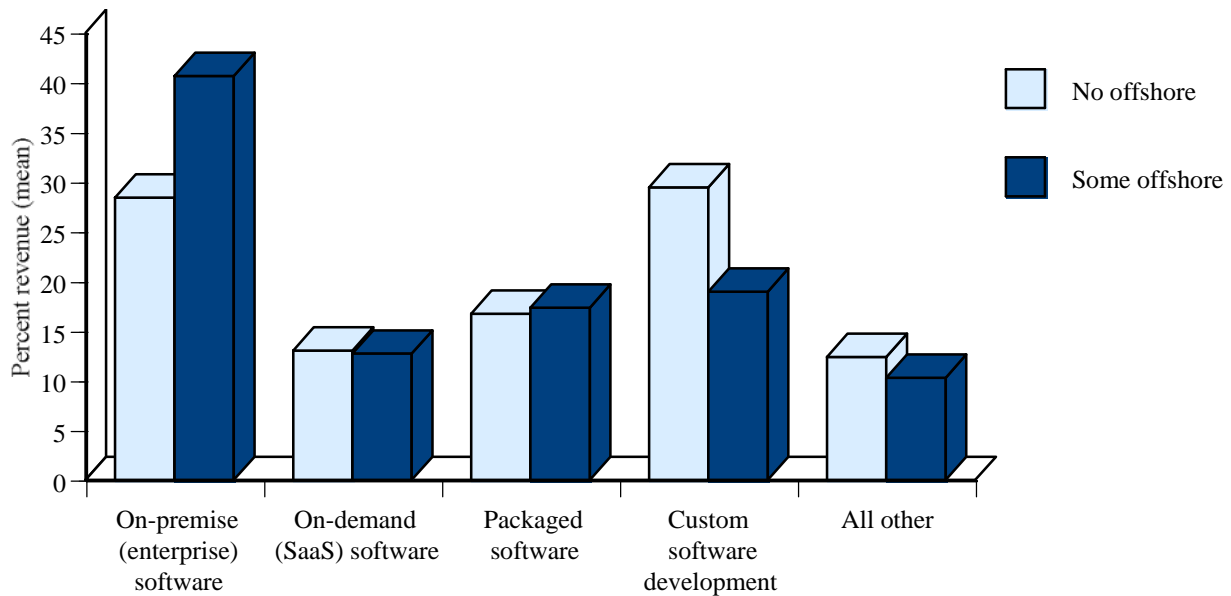
resources, or that there is a greater potential payoff for larger companies who can gain economies of scale in offshore operations.

Figure 1. Offshore development by size of company



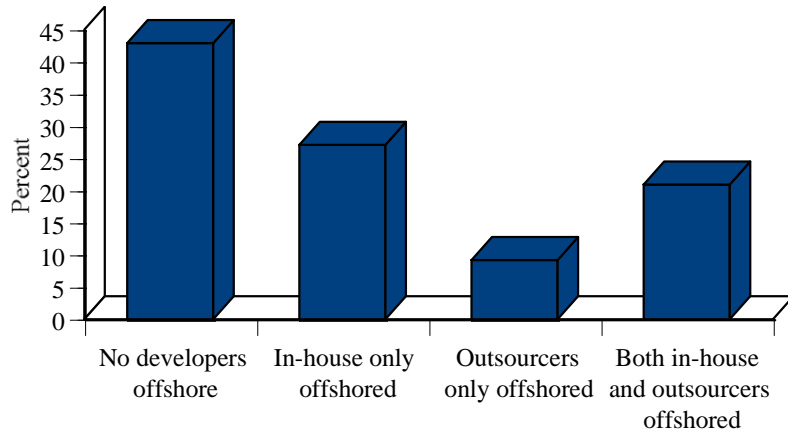
There also are differences between firms that have offshore development and those that do not in terms of the type of software that they develop. Firms that have offshore development have a higher concentration of revenues in on-premise (enterprise) software, and a lower concentration in custom software development (Figure 2). There is no significant difference for on-demand or packaged software developers.

Figure 2. Percent revenue by software category: Offshore versus non-offshore firms



We can further break down firms by their mode of development. These include those that have no offshore development, those who develop offshore using in-house (captive) developers only, those that go offshore via outsourcing only, and those that have both in-house and outsourced offshore development (Figure 3).

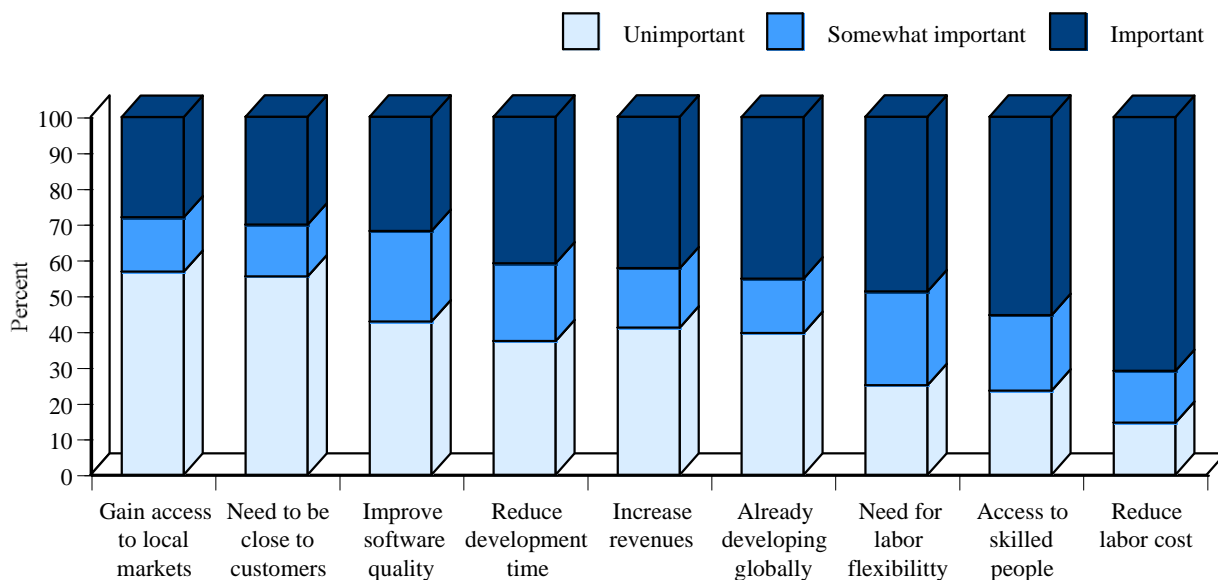
Figure 3. Mode of software development: percent of firms in full sample



Drivers of offshore development

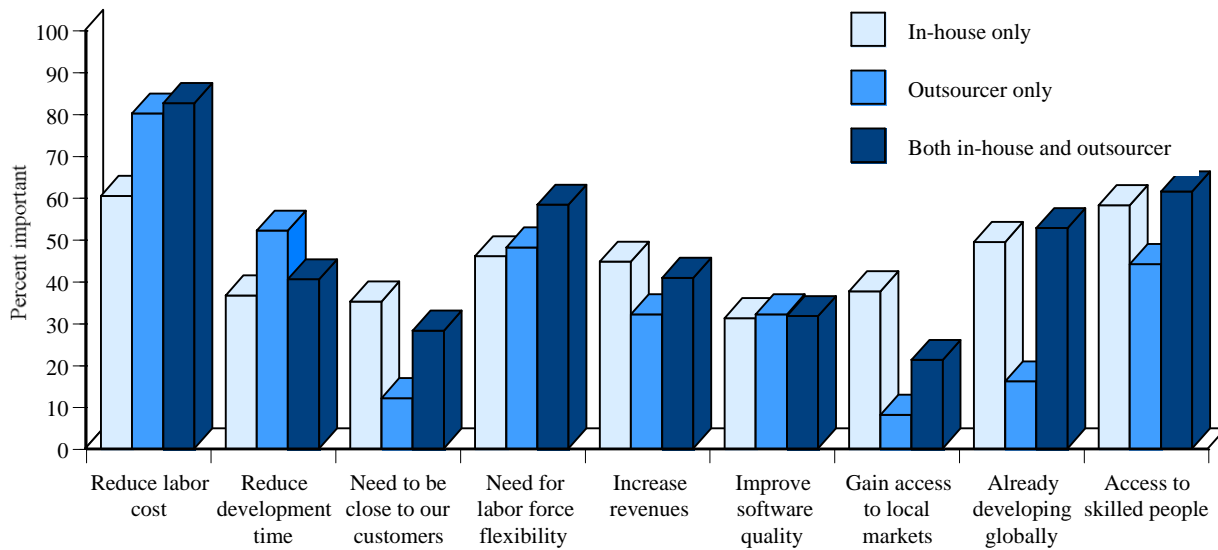
The most important factor driving firms to go offshore is to reduce labor cost, followed by access to skilled labor and need for labor flexibility (Figure 4). Least important are the need to be close to customers and desire to gain access to local markets outside the U.S. It is true, as noted above, that firms with offshore development have a much larger share of their revenues outside the U.S., but it appears that the main driver of offshoring is still the desire to find low-cost skilled developers.

Figure 4. Offshore drivers



There are significant differences in drivers by type of firm, however. Figure 5 shows that among those who have offshore development, firms with in-house (captive) only, or both in-house and outsourced offshore development are significantly more likely to mention the need to be close to customers or gaining access to local markets as reasons for going offshore compared to those who go offshore solely through outsourcing.

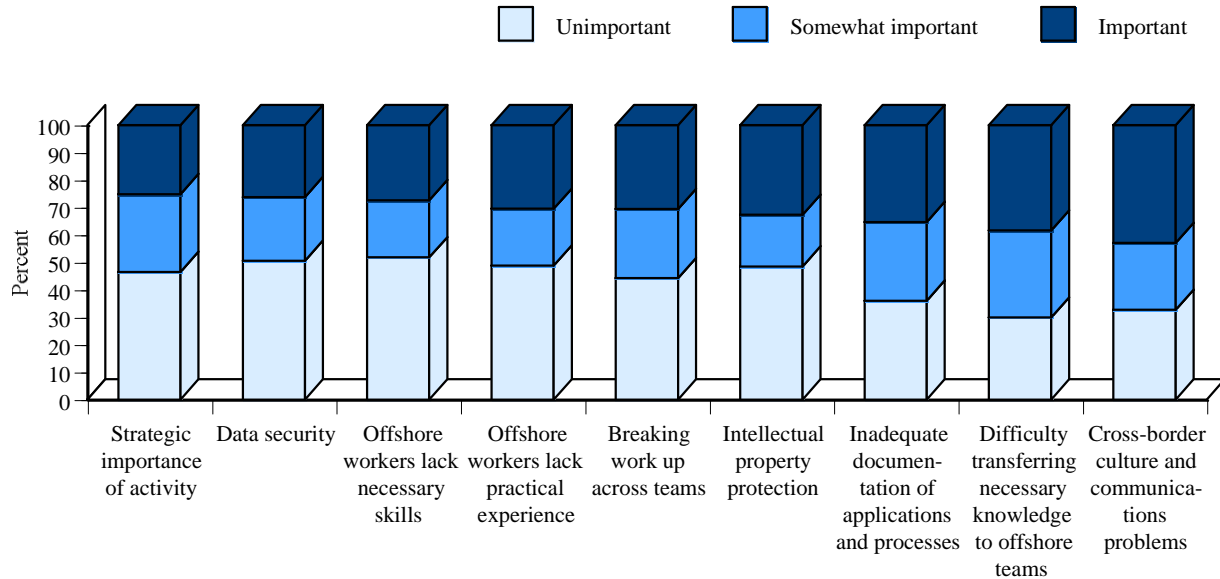
Figure 5. Offshore drivers for in-house and outsourced development



Obstacles to offshoring

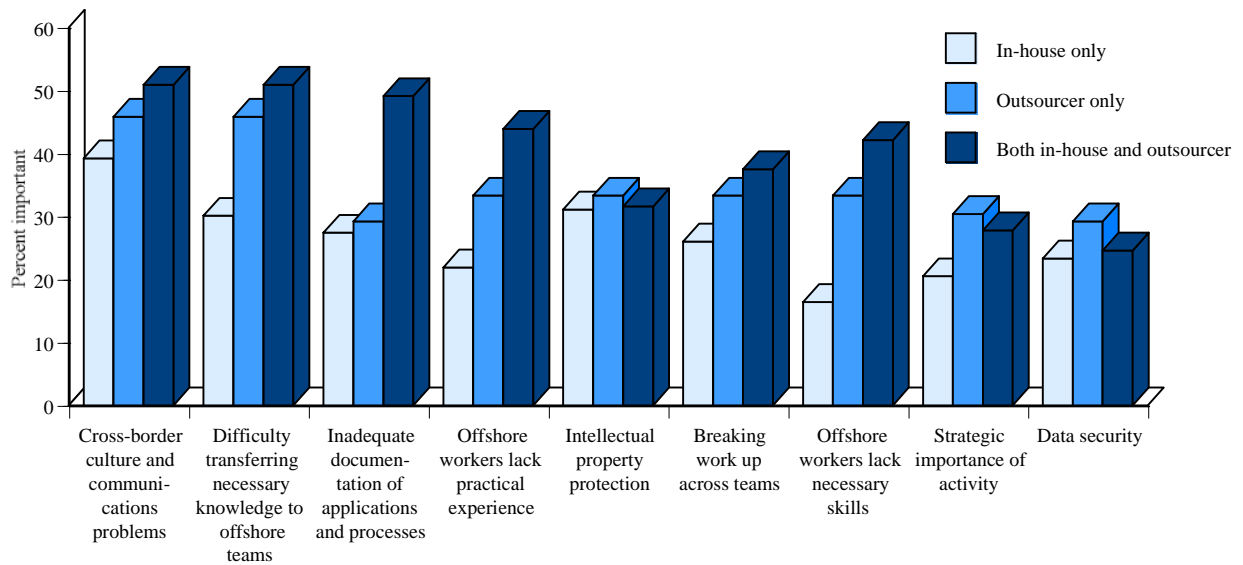
The biggest obstacles reported with offshoring involved cultural and communications problems, difficulties with knowledge transfer, and inadequate documentation of applications and processes (Figure 6). The skill and experience levels of offshore workers were less important, and concerns about data security or about moving strategically important activities were the least problematic. There was greater concern about intellectual property protection, so risk factors do come into play for many firms. Overall, however, the biggest challenges involve the process of collaborating and sharing knowledge among teams in different locations, compounded by cultural and perhaps language differences.

Figure 6. Obstacles to offshore development



Comparing firms by mode of offshoring (in-house, outsourced, both), we find that firms that use only in-house development report fewer problems in general (Figure 7). The differences among firms by mode of offshoring are statistically significant for difficulty transferring necessary knowledge, inadequate documentation, and offshore workers lacking necessary skills. Thus, it appears that firms are better able to hire skilled workers and manage the knowledge transfer process when they set up their own captive operations than when they outsource offshore development or do both.

Figure 7. Obstacles by mode of offshoring

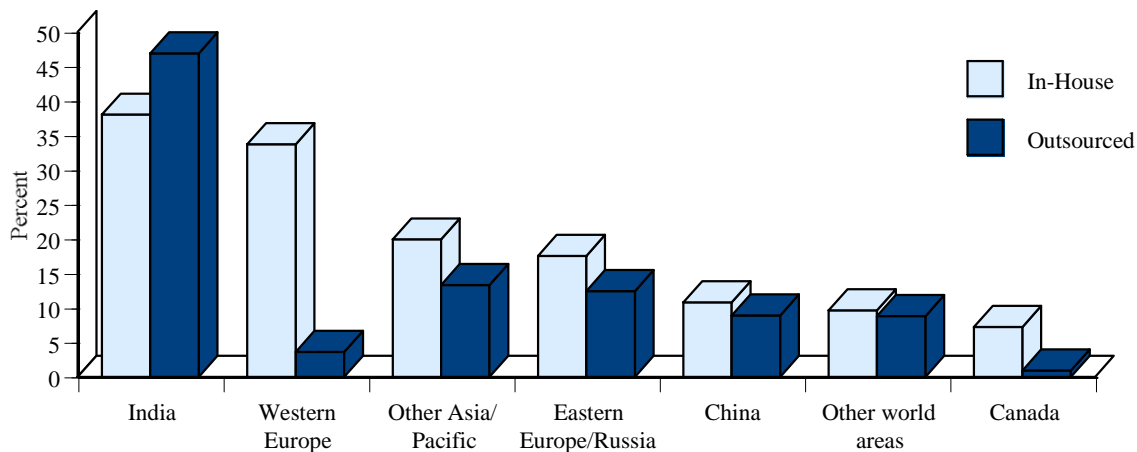


Location of offshore development

The most common location for in-house offshore development is India, identified by 38% of those firms who have any offshore development. Next is Western Europe, at 34%, followed by other Asia/Pacific (outside China) at 20%, Eastern Europe at 18% and China at 11% (Figure 8).¹

The picture is different for outsourced development. Here, India is more predominant, mentioned by 47%, with other Asia-Pacific a distant second at 13%, Eastern Europe next at 12% and China at 9%. These differences are consistent with the idea that in-house development is aimed more at serving affluent markets such as Western Europe, while outsourced development is mostly about access to low cost talent and is focused more in India. Also, many of the major outsourcing service providers are based in India and have most of their development there, so respondents might be outsourcing work to those firms.

Figure 8. Countries or regions where in-house developers are located



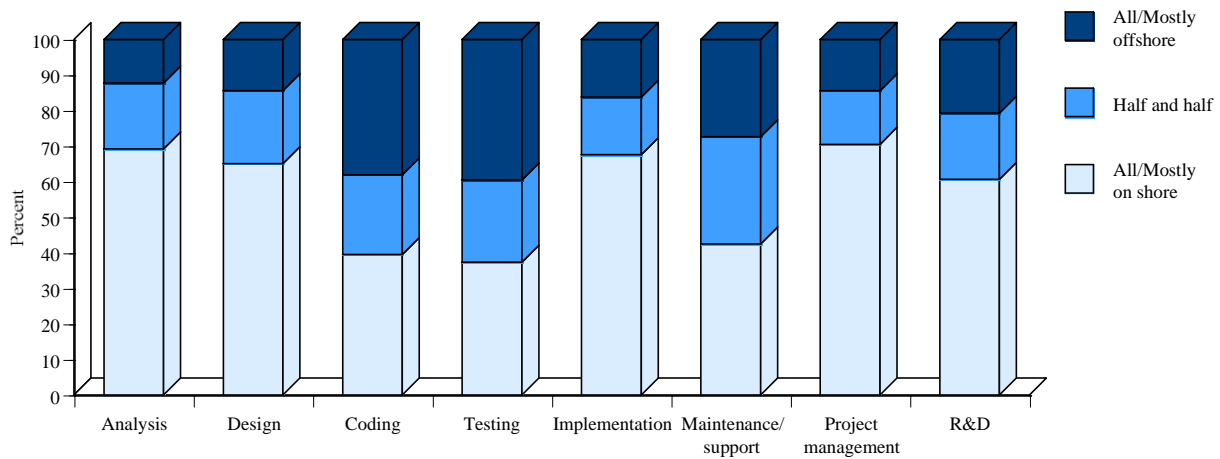
Which activities do firms conduct offshore

Software development can be divided into several different tasks or activities, including analysis, design, coding, testing, implementation, maintenance, project management and R&D. Firms may keep some activities onshore while moving others offshore, or they may move the entire process offshore for a particular project or product. It is often argued that more routine tasks can be more easily relocated, while more specialized tasks need to remain at home to utilize workers with specific skills and experience or to be close to customers.

In the case of in-house development (Figure 9), our results are consistent with these expectations. The activities that are most often carried out offshore are the more routine tasks of coding, testing and maintenance/support. Higher level activities such as analysis, design and R&D are less likely to be done offshore. Also less likely to be offshore is project management, which requires customer relationship management skill and experience; and implementation, which generally must be done at the customer's site.

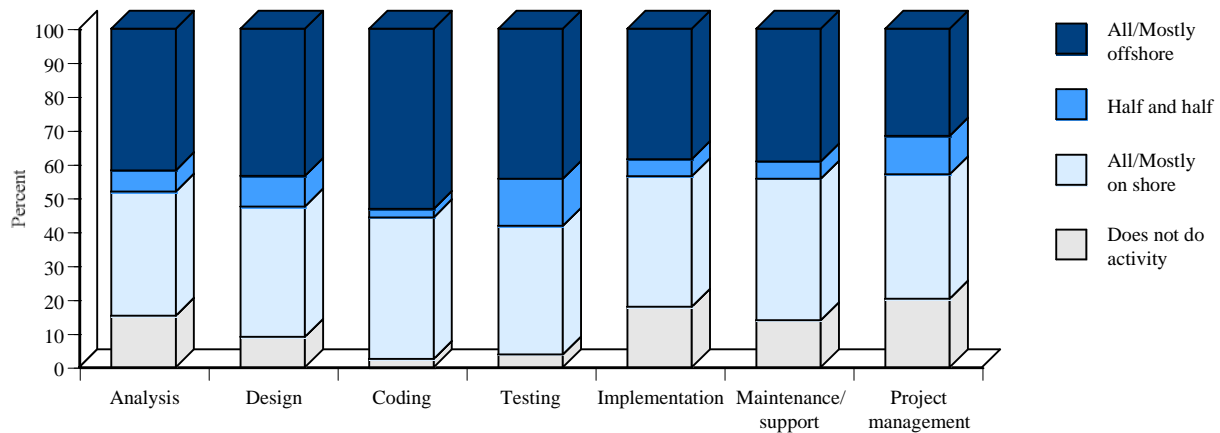
¹ Note that firms can have more than one offshore location.

Figure 9. Proportion of in-house development activities done onshore or offshore



The situation is different for outsourced development, however. In this case, a much higher share of analysis, design, maintenance, implementation and project management are done offshore (Figure 10). Again, this is probably at least in part due to end user firms outsourcing to foreign (especially Indian) firms who carry out the full range of activities in their own home locations.

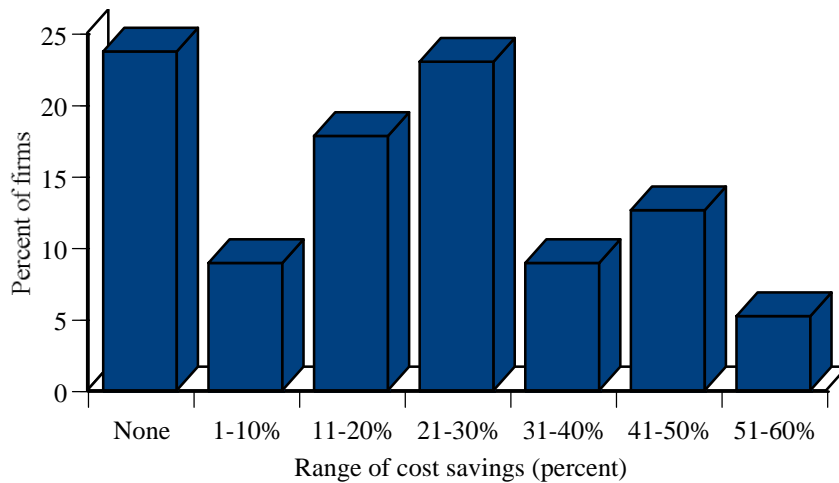
Figure 10. Proportion of outsourced development activities done onshore or offshore



Offshore Performance

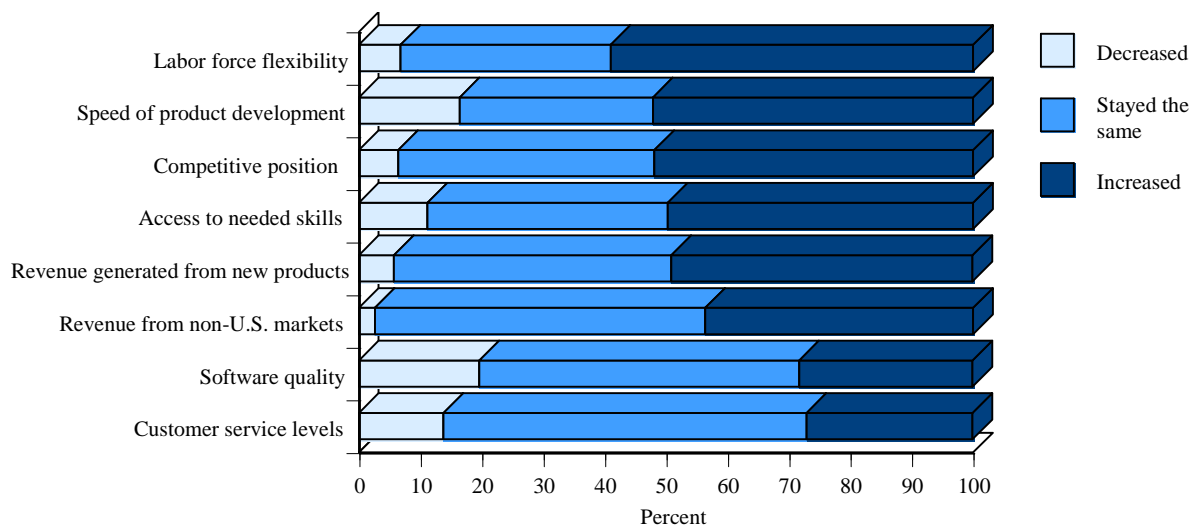
Respondents were asked how offshoring affected their firms' performance on several measures. First we looked at cost savings. The average (mean) cost saving reported was 24%, with a median of 20%. There was a wide variance in savings. Fully 24% of firms reported no cost savings at all, while 27% reported savings of greater than 40% (Figure 11).

Figure 11. Cost savings from offshore development



Respondents also reported impacts of offshoring on a number of qualitative measures (Figure 12). The greatest positive impacts were seen in labor force flexibility, with 59% reporting improvement. About half of all firms reported improvements in speed of product development, competitive position, access to needed skills, revenue from new products, and increased revenues outside the U.S. About a quarter reported improvements in software quality and customer service. Some firms reported worse performance as a result of offshoring, most commonly in software quality, speed of product development, and customer service.

Figure 12. Impacts of offshoring on performance

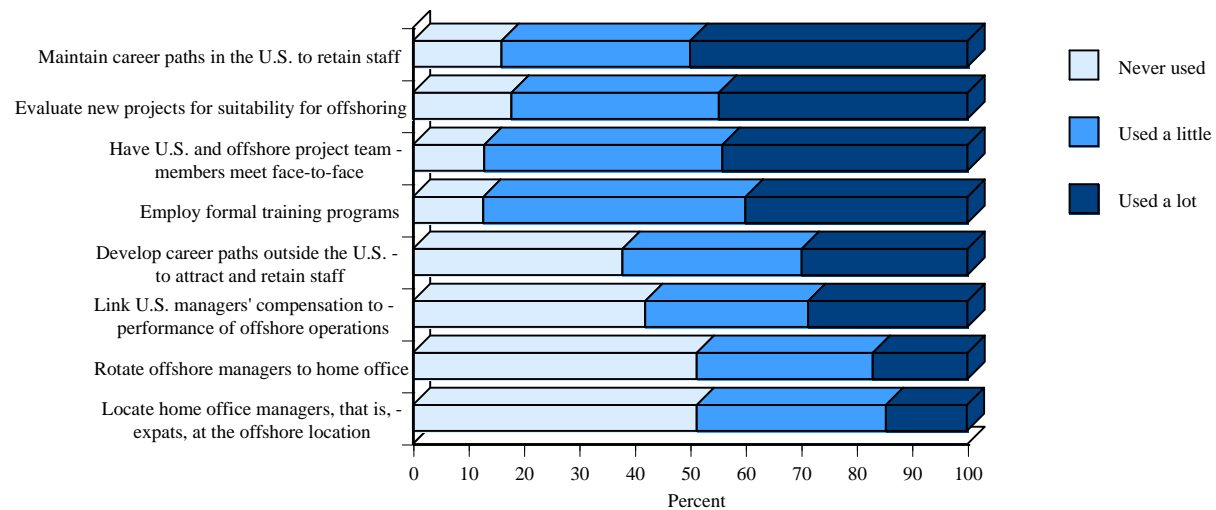


Management of offshore development

Firms use a number of tools to manage their offshore development processes (Figure 13). Half of those interviewed said they made extensive use of maintaining career paths in the U.S. to retain staff, an important issue when work is being moved offshore. Only 30% focus on developing career paths outside the U.S. to attract and retain offshore staff. About 45% evaluate new projects for suitability of offshoring a lot, a process likely to lead to greater use of offshoring.

In order to facilitate collaboration and knowledge sharing, 44% frequently have U.S. and offshore team members meet face-to-face, 40% use formal training programs, while only 17% rotate offshore managers to the U.S. and 15% have U.S. managers locate to offshore sites as expats. While U.S. managers may be responsible for the performance of offshore teams, only 29% of firms frequently link U.S. managers' compensation to the performance of those operations.

Figure 13. Offshore management practices



Among the firms in the entire sample, there was widespread use of a set of software development and project management practices (Figure 14). Interestingly, there was no significant difference between those that use offshore development and those that do not, even though practices such as standardization and formalized processes are often seen as prerequisites for effective offshoring.

Figure 14. System development and project management practices

