

WHITE PAPER

The Sun Certification and Team Performance: The Impact on Application Developers

Sponsored by: Sun

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IDC OPINION

Application development environments are increasingly complex. The pace of innovation is brisk. Legacy modernization, especially leveraging 3GL technology and integrated development environments, is being increasingly impacted by open source initiatives such as NetBeans. The speed of new technology introduction, compounded by ever-changing standards, has escalated the need for IT organizations to have a highly skilled and well-prepared workforce. Deploying, managing, and repairing a technology or solution without sufficient skills reduces the benefits organizations receive from their technologies. IDC believes that better-skilled development organizations are more capable of delivering high-quality applications that meet business objectives.

Key findings from a global IDC research study of 293 IT teams responsible for application development include:

- ☒ Many significant operational measures indicative of application development success are attained less than 70% of the time, suggesting that the average performance of application development teams can be improved significantly.
- ☒ Meaningful concentrations of certified application developers increase achievement of the most significant operational metrics, including applications meeting designed efficiency objectives, development projects completed on time, and meeting security standards.
- ☒ Team skill level, as measured by certifications, is directly responsible for organizational performance in several key IT functional areas.
- ☒ Teams with 50% of team members certified on relevant Sun technologies and processes perform at the top tier of operational performance.
- ☒ Every increase in certified staff improves performance in each metric reviewed. Team performance improves dramatically when more than 50% of the team is certified.
- ☒ Having 50% of a development team certified in Java (Sun certified) can improve performance in application development by more than 40%.
- ☒ Training, and ultimately certification, is critical to improving overall IT performance.
- ☒ Increasing the concentration of Sun-certified team members on a team directly impacts team performance.

SITUATION OVERVIEW

Worldwide IT organizations spent about \$6.5 billion on application design and development tools in 2007. To achieve value from their software investments, application development managers cautiously select the most appropriate technology, hire the most affordable and experienced consultants, and use sophisticated management practices to ensure functional success.

IDC believes that the talent of the IT team is often overlooked as the critical element of IT organizational performance. Team skill dramatically impacts the value IT organizations get from their technology improvements. Historically, there has been little research that attempts to describe the impact of certification on specific application development metrics. Based on a global IDC research study of 293 IT teams responsible for application development, this document identifies 10 key performance metrics for application developers and compares the performance of teams with various concentrations of certifications.

The research revealed the strong link between certification, training, and organizational achievement of key application development metrics. What is clear from this research is that well-trained teams perform demonstrably better than underskilled teams and that performance results in measurable improvement in productivity. Typically, teams that are well trained in best practices in development disciplines are more likely to meet both time and budget goals than their less prepared counterparts.

Metrics Matter

IT managers increase performance through close attention to a small number of key operating metrics. This study focuses on the application development function, an activity critical to overall IT success and particularly impacted by training and certification.

Overview of Performance Metrics

In a recent study of 293 application development teams, IDC assessed performance against 10 key process metrics. These metrics were chosen based on prior IDC research where IT managers identified key performance indicators of application development success.

Table 1 describes the level of performance achieved by application development teams. Each metric in Table 1 is represented by a frequency of achievement. For example, the first metric should be read as follows:

*For development groups with an average number of certifications,
75% of developed applications work at designed efficiency.*

TABLE 1**Key Process Performance Metrics: Application Development**

Performance Metric	Average Performance
% of developed applications that work at designed efficiency	75
% of development projects completed on time	73
% of developed applications that meet security standards	73
% of developed applications that interoperate with other applications	70
% of development projects with acceptable level of errors per line of code	69
% of developed applications that integrate business applications	69
% of developed applications that are readily modifiable to adapt to changes in business	67
% of development projects with full set of architectural design documents	59
% of developed applications that leverage Web services	56
% of staff commonly using new technologies to solve application development challenges	54

n = 247

Source: IDC's Certification Impact Study, 2008

Performance on the various application development metrics varied across the respondent companies. The "average performance" across all 10 metrics ranged from a low of 54% to a high of 75%, which indicates that the "average" performance is relatively mediocre. Examining performance of average development organizations, IDC found that 75% of developed applications work at designed efficiency. This "C+" performance suggests application development organizations in particular, and IT organizations in general, fail to live up to their business commitments 25% of the time. At the other end of the spectrum, the average frequency for the use of new technologies to solve application development challenges (54%) is surprisingly low. This operational metric shows the widest gap between low and high concentrations of team certifications. IDC believes that an untrained IT staff is disinclined to integrate new technology and that certification gives team members confidence to employ new technologies.

Certifications Impact Team Skill Level and Control of IT Risk

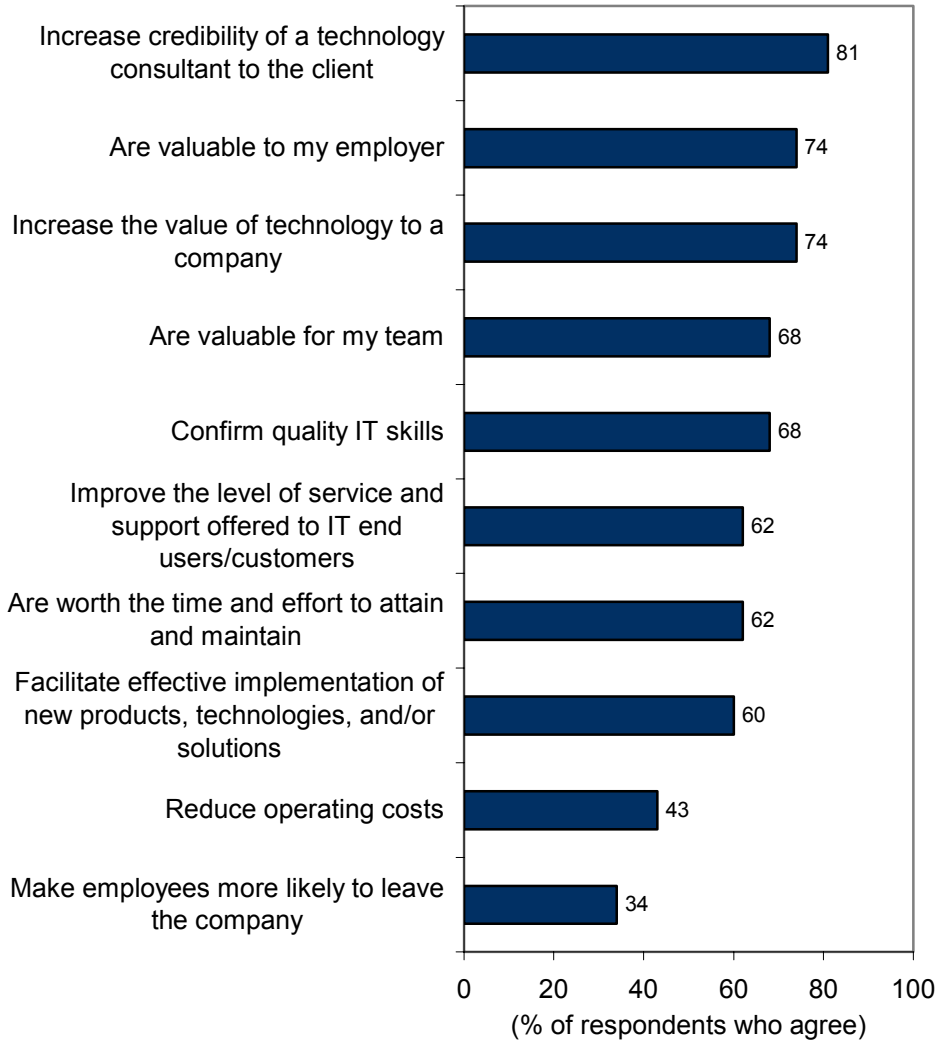
Other IDC research has shown that achieving high team performance is impacted by a number of factors, including turnover, motivation, installed technology, experience, training, and certification. IDC finds that of these factors, training and certification have the most significant impact. Consequently, well-trained and certified teams derive more benefit from their technology investments than undertrained teams. When teams are sufficiently trained, their functional performance dramatically improves. The best way to ensure that training is understood and can be applied on the job is through a rigorous certification.

IT department heads believe that certifications improve the value of a technology to a company and confirm the skills of a team member. Certifications also have a high value to both the team and the enterprise itself (see Figure 1).

FIGURE 1

Impact of Certifications on IT Performance

Q. *Certifications...*



n = 283

Source: IDC's Certification Impact Study, 2008

Certification, at its core, is simply an attestation to the capability of the test-taker's skill on particular tasks. To design a reliable and informative certification, the certification sponsor attempts to isolate those skills and behaviors that improve (or retard) performance and develop a test that reliably predicts the test-taker's knowledge of those items. So, to the extent the test elements are relevant to a particular organization, the test-taker who passes a test has demonstrated a level of capability or proficiency that the certification sponsor says is sufficient to improve performance. While this seems complicated, IT managers understand the impact that certifications have on IT performance.

Impact of Sun Certification on Team Performance

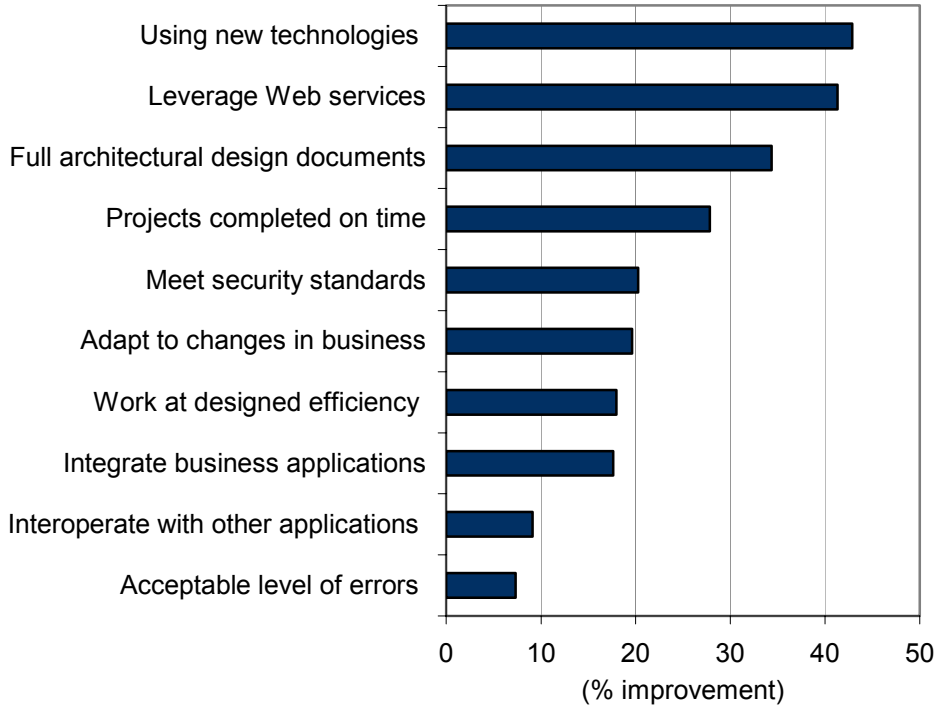
As we mentioned earlier, the performance of the development teams increases with higher concentrations of certified team members. We were interested if this also held true for teams with higher concentrations of certifications from a specific vendor. To test the validity of managers' perceptions that certifications improve the level of support and improve the overall quality of IT service delivery, we isolated the relative concentrations of certifications — specifically Sun certifications — to observe the impact that high or low concentrations of certifications had on a team's performance against these standard metrics. The study results were segmented into quartiles based on number of certified staff.

Revisiting some of the key metrics shown earlier, we calculated a "percent improvement" score using the following equation: $((\text{average of the top quartile of certified teams} - \text{average of the bottom quartile of certified teams}) / \text{average of the bottom quartile of certified teams})$. With this performance improvement score, it is readily apparent that organizations with higher concentrations of Sun-certified staffs outpace less certified teams across all facets of application development.

In general, we found a marked increase in team performance when more than 50% of a team is certified. For several metrics, improvements of more than 25% were observed (see Figure 2).

FIGURE 2

**Key Process Performance Metrics — Impact of Certification:
Application Development**



n = 247

Note: Performance improvement is the percentage difference between high and low concentrations of certified developers.

Source: IDC's Certification Impact Study, 2008

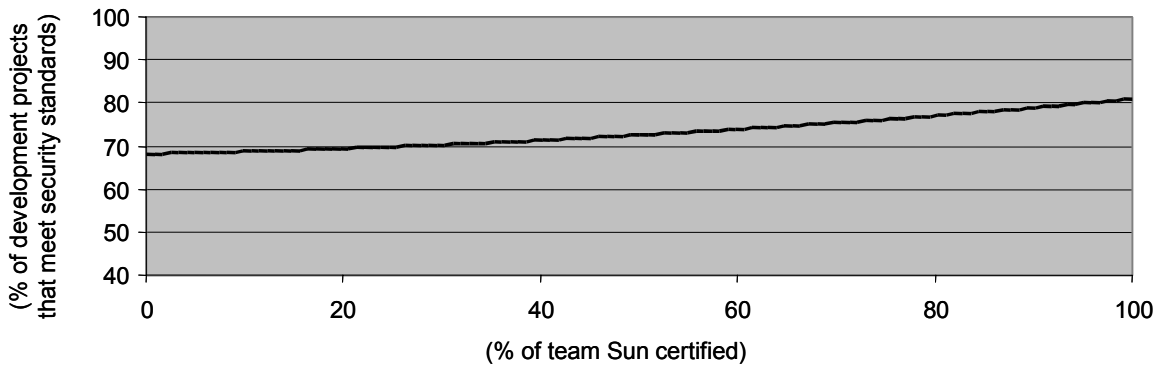
To further illustrate the range of performance, we offer three examples of how performance changes depending on the concentration of Sun-certified staff. We chose to highlight areas that have a high gain and metrics that have a direct impact on organizational performance:

- ☒ **Meet security standards.** An enterprise's policy on security — access security, data privacy, or other objective — is only as effective as an enterprise's compliance with those standards.
- ☒ **Projects completed on time.** Clearly, this metric has business value, especially when an application is tied to a particular business initiative that must be delayed when the supporting application isn't available.
- ☒ **Leverage Web services.** Leverage and reuse is a key measure of development efficiency and also improves design efficiency.

Figure 3 shows the range of performance in whether an application meets corporate security standards when initially developed. High concentrations of Sun-certified developers produce code sets that meet security standards more than 80% of the time when initially completed.

FIGURE 3

Percentage of Development Projects that Meet Security Standards by Percentage of Team with Sun Certifications

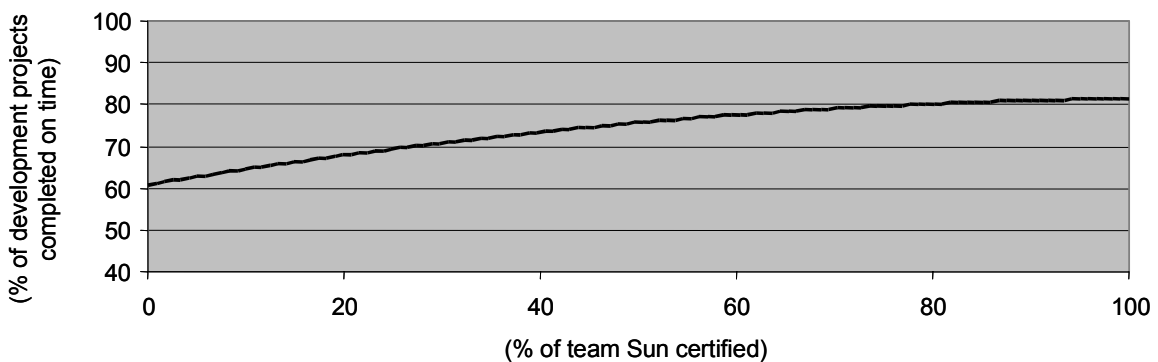


Source: IDC, 2008

Figure 4 shows the difference in achieving on-time delivery of development projects with different percentages of certified staff.

FIGURE 4

Percentage of Development Projects Completed on Time by Percentage of Team with Sun Certifications



Source: IDC, 2008

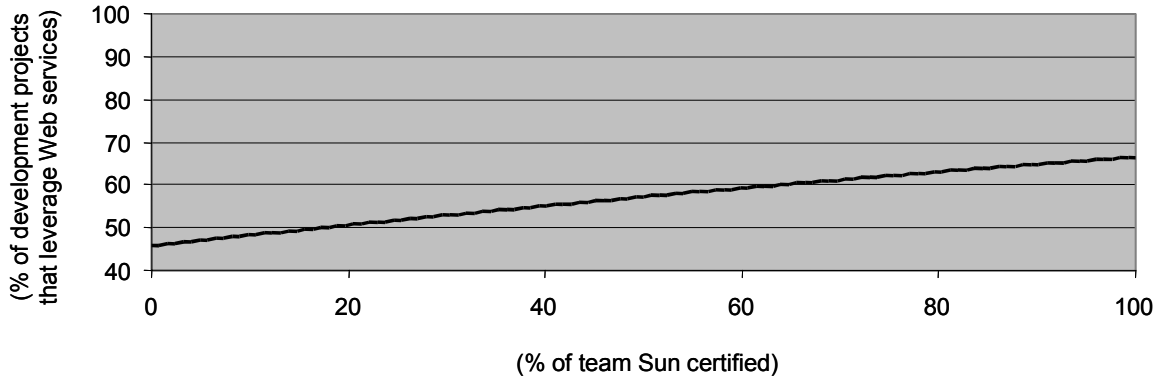
Figure 4 shows the percentage of development projects completed on time against the percentage of the team that held a development certification from Sun. (These teams were also programming in Java.) The teams with the highest concentrations of certifications — over 50% of the team certified — completed about 80% of their projects on time. This finding suggests that for Java development teams to perform at their "peak" according to this metric, 50% of the team should be certified.

In a final illustration of the impact of certification, consider one of the most important metrics for application developers: the frequency with which new applications leverage Web services. In this integrated, data-rich environment, developing applications that leverage standard application functions or facilitate interoperability with other applications is important both for development efficiency and to maximize security and reduce errors.

At the most basic level, teams with higher concentrations of certified team members are better able to leverage the built-in features and functions of a technology or tool than teams with fewer certified team members. Teams that leverage features use the features of the language more effectively and increase their own productivity. At the same time, certified team members are better able to anticipate problems, implement preventative actions, and work to develop operational improvements than their less certified counterparts because of their familiarity with the capabilities of the deployed technologies. Leveraging Web services is an example of the increasingly complex environment facing application developers and the impact that increased concentrations of certified team members have on performance (see Figure 5). Effectively using Web services requires a deep understanding of both the development language and the Web service to be integrated. Of all teams surveyed, the "average" employed Web services in about half of all projects. Teams of Sun-certified developers, working in Java, with as few as 10% of the team certified integrate Web services into new development projects about half the time. When the concentration of Sun certification increases to 50%, nearly 60% of projects include Web services. The teams with the highest concentrations of certified team members integrate Web services nearly 70% of the time. The relationship between certification and performance is indisputable. Every new certification increases application development team performance.

FIGURE 5

Percentage of Development Projects that Leverage Web Services by Percentage of Team with Sun Certifications



Source: IDC, 2008

Figures 3–5 suggest that an increase in the concentration of Sun certification directly improves team performance on these metrics. Each certification improves the application development team's performance. Clearly, IT managers must maximize their teams' skills to maximize team performance and the value received from their technology investments.

How to Increase Team Skill: Trusted Sources

IT managers are constantly balancing the benefits of and investment in training against the day-to-day operational requirements of the business. This tension forces IT managers to be particularly practical when choosing the types of training they most value. Value comes from balancing the source of training that is most "trusted" with the type of training considered most "convenient."

IT managers believe job experience and instructor-led training (ILT) are the most trusted sources of skill enhancement. IDC research shows their attitudes are reinforced by their belief that ILT and experience represent the most practical, complete, and relevant sources of skill delivery. At the same time, no manager has the freedom to send employees only to instructor-led classes, so managers choose the methods that they believe best represent the most authoritative and effective methods of instruction. Managers believe that "authorized" training focused on achieving certification and combined with on-the-job experience represents the most impactful combination of readiness for high performance.

Just as IT managers make technology decisions that they believe add to their organizational performance at a reasonable cost, they also invest in training that IT managers believe is on point and achieves the desired results cost-effectively. It is important that training materials be highly effective in helping IT staffs meet goals for IT process improvement.

CONCLUSION

To maximize the value received from technology investments, IT managers must maximize their teams' skills in areas where performance is critical. The benefits include technical performance improvement, increased team productivity and performance, and greater return on technology investments. Application development, including activities of developers, business analysts, and other professionals to create traditional applications, is especially susceptible to changes in team skill. IDC found that more application development projects were completed on time and more projects were completed on budget by teams with high concentrations of Sun-certified professionals. The benefits of team skill can be significant and include the following:

- ☒ Having 50% of an application development team certified in Java (Sun certified) can improve performance in application development by more than 40%.
- ☒ Training, and ultimately certification, is critical to improving overall IT performance.
- ☒ Relevant work experience increases the perceived value of certifications.
- ☒ The functional performance of fully certified teams is dramatically better than the performance of poorly trained teams. This includes a 42% increase in on-time projects and a 30% increase in applications that meet security standards.
- ☒ Every increase in certified staff improves performance in each metric reviewed. The performance of the team improves dramatically when more than 50% of the team is certified.
- ☒ Training has a positive effect on a variety of operational activities such as the rates of application performance, deployment timeliness, and other metrics.

Ultimately, IT managers make technology decisions that they believe add to their organizational performance at a reasonable cost. Research demonstrates that improving team skill through certifications has a significant impact on the success of those strategies. IT organizations that believe that the talent of their teams can keep up with the change in technology without actively developing skills risk poor performance and failed investments.

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