

THE SIP REPORT

Software Industry Performance Report



Executive Summary

The IT software industry is often the subject of damning media reports, with continual tales of software development projects that have been abandoned at great cost, or are orders of magnitude over budget and/or duration. As the decades roll by the disasters continue. Or do they? Is the IT software industry performing better now than it was 20 years ago?

This report is based on research performed by the ISBSG using data submitted to its Development and Enhancement repository of close to 6,000 software projects.¹

It is important to note that the ISBSG repository is dominated by small to medium sized projects (<800 FP).

¹ In an attempt to provide the industry with a base of project history data from which it could learn and improve, the not-for-profit ISBSG was established in the mid-nineties, it has created a repository of software project history data that contains close to 6,000 projects and it continues to grow.

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Productivity over Time

The ISBSG analysed its software project history data to see if there have been any improvements in productivity over a 20-year period.

We grouped the data into five-year periods. For these groups, the following table (for all software development – New and Enhancements) shows the median number of hours taken to produce a function point of software²:

Year Groups	Median Project Delivery Rate (PDR) (hours per FP ³)
1989-1993	9.45
1994-1998	7.04
1999-2003	10.97
2004-2008	12.55

Figure 1: Median PDR over time

Despite the continuous search for silver bullets and/or the Holy Grail of software development, it is taking about eighty percent longer now to develop a function point of software than it did in the mid nineties.

Defect Rates over Time

This is an analysis of the percentage of projects in each period that reported some defects in the first 30 days of operation (i.e. it shows whether more projects or less projects are free of reported defects in the first 30 days of their operation).

Year Groups	Percentages of projects reporting no defects in first 30 days
1989-1993	12%
1994-1998	23%
1999-2003	46%
2004-2008	50%

Figure 2: Defect rates over time

² Note: These figures are based on level 1 effort only, and size in unadjusted function points (UFP). The ISBSG collects data about the people whose time is included in the project at three levels: Level 1 – Development Team only; Level 2 – L1 plus Support and IT operations personnel; Level 3 – L1 and L2 plus Customer and End User time. For a full definition refer to the ISBSG Glossary of Terms at <http://www.isbsg.org>

³ Scaled to equate to IFPUG V4.2 counting practice

There is a clear trend here. Among projects that report data about defects, the percentage of projects with no post-release defects rises steadily. This appears to be a trade-off. It takes longer to deliver a FP in recent years, but the quality of what is delivered is higher.

This aligns with the results of our analysis of the use of software quality assurance (SQA) over time. The chart below shows the percentage of projects that used SQA.

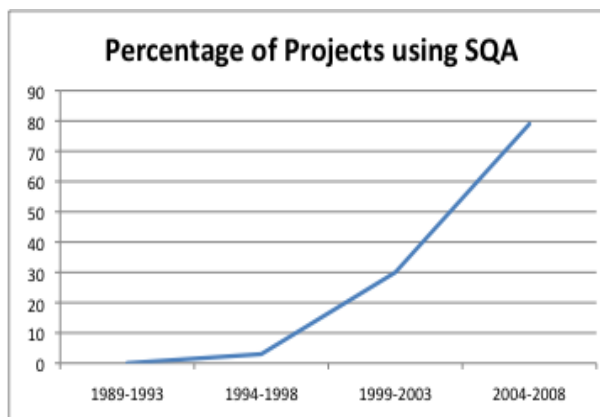


Chart 1: Use of SQA over time

Speed of Delivery over Time

This analysis shows the median speed of delivery for projects in each of the year groups. The speed of delivery is the functional size (in FP) per month divided by the maximum team size.

Year Groups	Median speed of delivery (FP pm divided by max team size ⁴)
1989-1993	8
1994-1998	9
1999-2003	5
2004-2008	4

Figure 3 – Speed of delivery over time

These results echo the productivity figures shown in the PDR table (*Figure 1 – Median PDR over time*).

Observation - Project Elapsed Time (New Developments)

Although the median project size for new developments from 1994 onwards sits at around 300FP, duration has become shorter from 1999 onwards, so it looks like the focus has been on reducing project duration, rather than on improving productivity. This aligns with observations about larger teams being used in more recent years.

⁴ For a definition of maximum team size refer to the ISBSG Glossary of Terms at <http://www.isbsg.org>

The Accuracy of Estimates of Project Effort

More projects are being delivered close to the estimated effort (and therefore, cost) than was the case fifteen years ago. The following chart shows the encouraging trend of a much higher percentage of projects being delivered close to their estimates of the effort required.

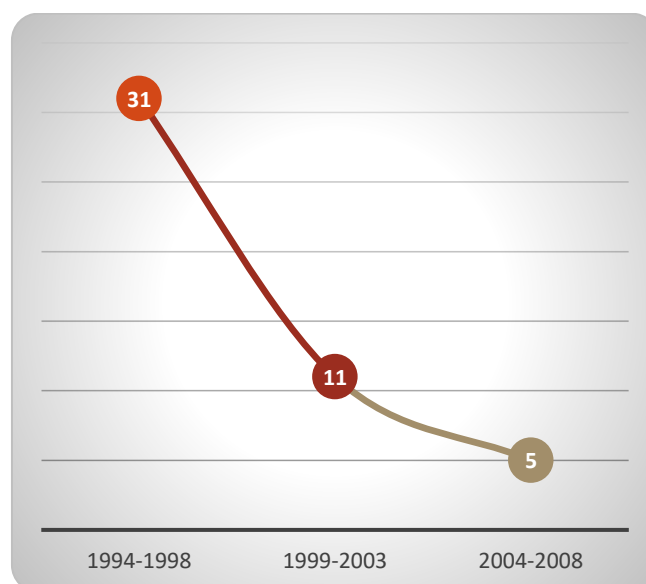


Chart 2: New development software project median over-run

For the period 1989-1993 there was insufficient data. In the subsequent periods the median over-run above the effort estimate dropped from 31% to 5%. In the most recent time frame 61% of all projects were within plus or minus 20% of their effort estimate.

Accuracy of Estimates of Project Duration

More projects are being delivered close the estimated duration than was the case fifteen years ago. The following chart shows the encouraging trend of a much higher percentage of projects being delivered close to their estimates of the time needed to complete the project.

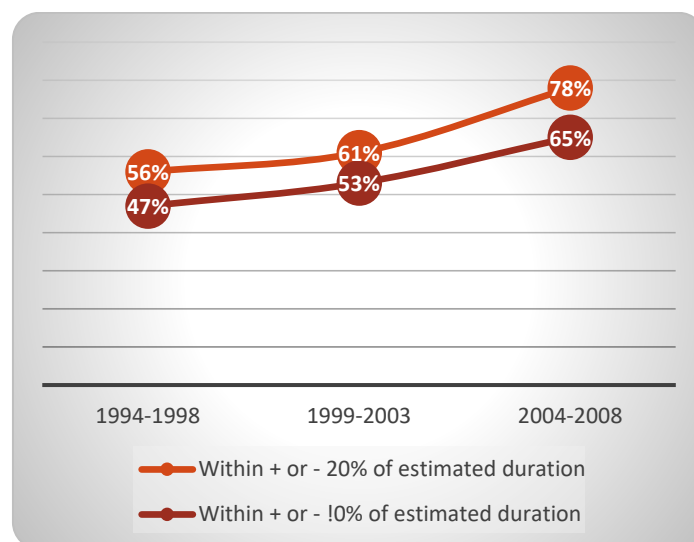


Chart 3: New development software duration estimate accuracy

For the period 1989-1993 there was insufficient data. In the subsequent periods, for projects that over ran the estimated duration, the median over-run dropped from 50% to 13%. In the most recent time frame 78% of all projects were within plus or minus 20% of their duration estimate.

Accuracy of Estimates of Software Size

Since 1994 there has been very little change in the percentage of projects that have their software size estimated accurately. There has only been a slight improvement from the first period when 30% of projects had an underestimated size, to 26% in the most recent era.

But the number of projects that have their software size estimated within plus or minus 20% has improved from 48% in the first period to 65% and 64% respectively for the following two periods.

Project Work Type over Time

The following chart shows the change in the type of projects being undertaken (New Developments versus Enhancement) over time.

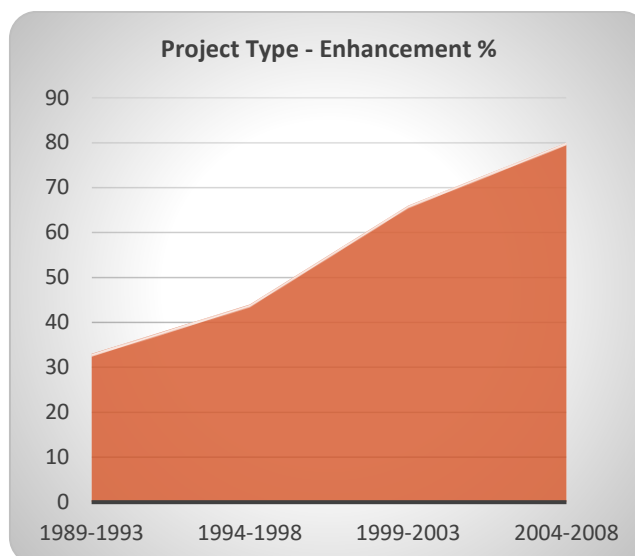


Chart 4: Project work type over time

In the data that the ISBSG has collected there has been a significant swing away from new project developments and an increase in the amount of projects that are enhancements to existing systems.

Size of Projects over Time

The following chart shows the median project size for the four year-groups, split between new developments and enhancements.

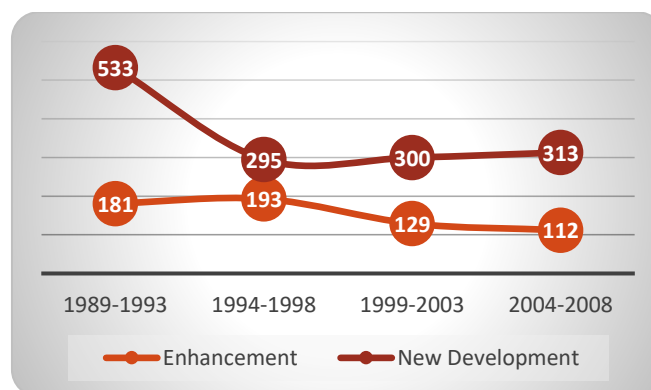


Chart 5: Project size over time

The large change in median size of new developments from the first year group to the second is possibly a quirk of the data that was collected for that first period. For the following three year-groups the median size of new developments is consistently around 300 FPs.

The median size of enhancement projects has steadily decreased over time, from 181 FPs in the first year group to 112 FPs in the fourth year-group.

Programming Languages

Cobol dominated the submissions to the ISBSG repository for 15 years -up to 2003, peaking at 40% of all submissions in the late nineties. By the end of 2008 Java represented almost a third of all submissions, with VB and C# .net on 21% and Cobol trailing on 12%.

These figures cover new developments and enhancements, so the continuing Cobol presence is understandable.

Another point revealed by the history is the learning curve involved every time a new language is adopted. It seems to take 18 months of low productivity before output starts to match established languages.

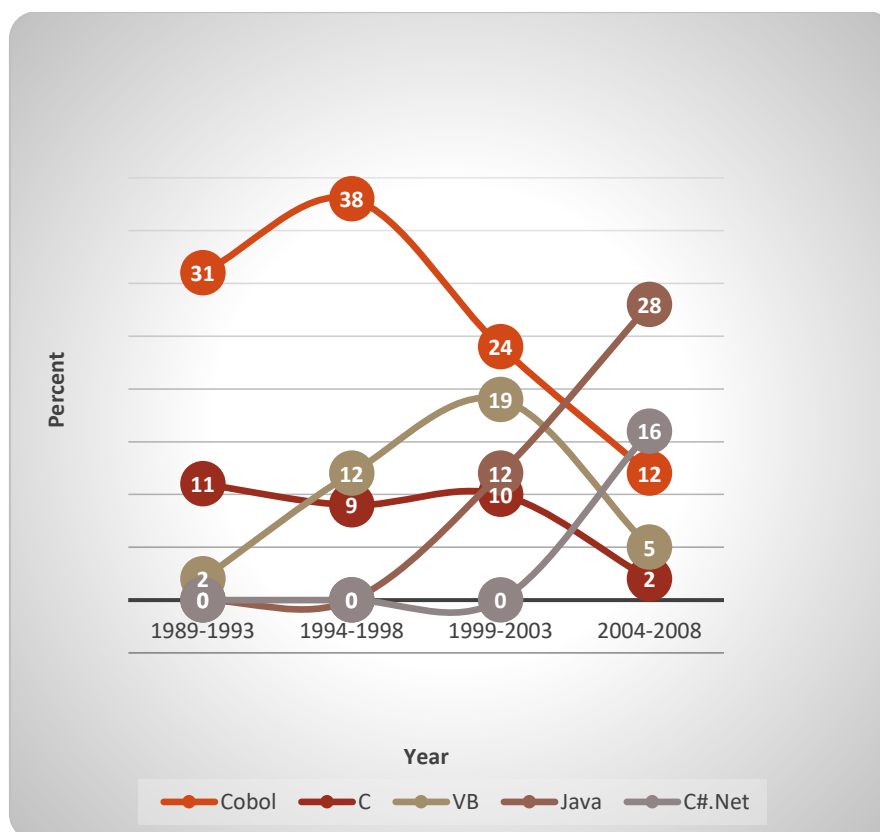


Chart 6 – Project submission percentage by programming language

Use of Methodologies

Among projects that report data about use of a methodology, the use has increased from 83% to almost 100% over time. Purchased methodologies have disappeared: they now appear only as part of the combined 'purchased/in-house' description of the source of the methodology.

Conclusion

This report provides a number of positives about the current state of the software industry.

However, it is important to remember that the ISBSG repository reflects the better performers in the industry as the data has been voluntarily submitted, which in turn suggests a certain level of maturity has been reached by the submitting organisations.

The International Software Benchmarking Standards Group (ISBSG)

The ISBSG is a not-for-profit organization founded in 1997 by a group of national software metrics associations. Their aim was to promote the use of IT industry data to improve software processes and products.

ISBSG is an independent international organization that collects and provides industry data of software development projects and maintenance & support activities in order to help all organizations (commercial and government, suppliers and customers) in the software industry to understand and to improve their performance. ISBSG sets the standards of software data collection, software data analysis and software project benchmarking processes and is considered to be the international thought leader in these practices.

The ISBSG mission is to help YOU and your organization improve the estimation, planning, control and management of your IT software projects and/or maintenance and support contracts.

To achieve this:

ISBSG maintains and grows 2 repositories of IT software development/maintenance & support data. This data originates from trusted, international IT organizations and can be obtained for a modest fee from the website www.isbsg.org/project-data/

Help us to collect data

ISBSG is always looking for new data. In return for your data submission, you receive a free benchmark report that shows the performance in your project or contract against relevant industry peers.

Please submit your data through one of the forms listed on <http://isbsg.org/submit-data/>

Partners

This page will help you to find an ISBSG partner in your country:

<http://isbsg.org/meet-isbsg-partners/>