

RETURN ON INVESTMENT (ROI) IN SOFTWARE PROJECT MANAGEMENT TOOLS AND SOFTWARE QUALITY CONTROL

The construction of large software systems is one of the most hazardous activities of the business world. The failure or cancellation rate of large software systems is over 50%. Of the large systems that are completed, about two thirds experience scheduled delays and cost overruns. Yet some large systems are finished early, meet their budgets, and have few if any quality problems. How do successful projects differ from projects that fail? Better project management and better quality control are the most important differences between success and failure in the software world. Thus excellence in software project management has a very favorable return on investment (ROI) due to cost avoidance.

"What was surprising was that all of the successful projects tend to follow a similar pattern even though they were created by different companies, in different countries, and within different sub-industries, and had different business and technical purposes for creation... The pattern is this: there are myriad ways to fail when building large software systems. There are only a very few ways to succeed. All of the paths that lead to successful software have these twelve essential attributes: effective project planning, effective project cost estimating, effective project measurements, effective project milestone tracking, effective project quality control, effective project managers, capable technical change management, effective development processes, effective communications, capable personnel, significant use of specialists, substantial volumes of reusable material.

A **function point** is a unit of measurement to express the amount of business functionality an [information system](#) provides to a user. [Wikipedia]

Using these six size ranges, table 1 shows the approximate frequency of various kinds of outcomes, ranging from finishing early to total cancellation. Table 1 is taken from the author's book, *Patterns of Software Systems Failure and Success* (International Thomson Press, 1996 and republished in the author's newer book *Estimating Software Costs*, McGraw Hill 2007).

Table 1: Software Project Outcomes By Size of Project
PROBABILITY OF SELECTED OUTCOMES

	Early	On-Time	Delayed	Canceled	Sum
1 FP	14.68%	83.16%	1.92%	0.25%	100.00%
10 FP	11.08%	81.25%	5.67%	2.00%	100.00%
100 FP	6.06%	74.77%	11.83%	7.33%	100.00%
1000 FP	1.24%	60.76%	17.67%	20.33%	100.00%
10000 FP	0.14%	28.03%	23.83%	48.00%	100.00%
100000 FP	0.00%	13.67%	21.33%	65.00%	100.00%
Average	5.53%	56.94%	13.71%	23.82%	100.00%

As can easily be seen from table 1 small software projects are successful in the majority of instances, but the risks and hazards of cancellation or major delays rise quite rapidly as the overall application size goes up.

Table 2: Differences Between Successful and Unsuccessful Software Projects In the 10,000 Function Point Size Category

Successful Projects

Software cost estimating tools
Quality estimating tools
Project management tools
Project cost tracking tools
Formal project milestone tracking
Formal design reviews
Formal code inspections
Formal testing

Unsuccessful Projects

Manual estimating methods
No quality estimates performed
Partial use of project management tools
Partial use of cost tracking tools
Informal milestone tracking
No design reviews utilized
No code inspections utilized
Informal testing

Tools by themselves do not make successful projects. Capable managers and capable technical personnel are also needed. However, attempting to construct large software projects without adequate management and quality control tools is not a safe undertaking. No one in the industrialized world today would dream of starting a large engineering project without adequate tools for project management. Yet software projects whose total staffing compares to many large-scale engineering projects are routinely started using "back of the envelope

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Full article:

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