

Critical Success Factors in eBusiness Project Management

The results of a study into effective eBusiness project management

Background

John Carroll is a project management consultant, based in the South West of England, with many years experience of software development project management. In recent years this has increasingly involved eBusiness projects, often using some of the more radical software development techniques, such as rapid application development (RAD), extreme programming and the like. One question that often gets asked in this environment is: do the traditional project management methodologies and processes apply to these fast-moving projects or are they now inappropriate? A review of current literature seemed to indicate that this question had not previously been researched and hence the need for this study.

Approach

Following a review of critical success factors, a questionnaire was developed to probe for these and other factors in a project. This evolved into a number of questions about the methodology and life-cycles used on a project, together with questions about the project management processes used. The initial process questions were based on the 44 processes defined by the PMBOK (PMI, 2004). But as these did not cover all the success factors identified, a further six areas were defined, based on PRINCE2 (OGC, 2002):

- Active and committed top-management support
- Full involvement of the end-users right through the project
- Establishment of a business case for the project
- Project team empowerment through management by exception
- A formal issue management process
- A formal configuration management process

Finally questions were added to cover the basic demographic data of the projects, project managers, project resolutions and success criterion. The questionnaire was placed on the Project Management Institute (PMI) and the British Computer Society (BCS) Project Management Specialist Group (PROMS-G) web sites with a request for volunteers. Unfortunately, this produced no response, so the members of the PMI eBusiness Special Interest Group (EBSIG) were emailed directly along with the author's associates and clients. This direct approach produced 26 responses which were then analysed.

Demographics

The project managers in the sample were aged between 27 and 62 (with an average age of 45), they had between 2 and 36 years project management experience (average 14 years) and were predominantly male (81%). This probably reflected the bias towards professional project managers in the sample group.

Traditionally project size has been measured in the duration, cost and number of people working on the project. However, it was decided that cost was too vague a metric as some businesses do not cost internal staff and others include computer hardware and operating costs. Work effort (people/days) was seen as a more suitable metric so, for this study, project size was measured in terms of duration (months), work effort (days) and maximum number of people working on the project at any one time. Table 1 displays the results and shows that the average project lasted around 7 months, required 930 days work effort and had a maximum of 18 people on the project at any one time.

Metric	Minimum	Maximum	Mean
Duration (months)	3	12	7
Work effort (days)	35	3,330	930
Number of people (max)	2	110	18

Table 1: Project Size

In terms of the project resolution, 33% of the projects in the sample were successful (i.e. completed on-time, within budget and with all required features and functionality) which is fairly close to the Standish (2004) result of 29% and their previous result of 34%. However, 63% of the projects in this survey were challenged (i.e. did not meet one or more of the three success criteria) and 4% (one project) failed (was abandoned or not implemented). This compares to the Standish figures of 53% challenged and 18% failed. Initially it was thought that the lower failure rate might be indicative of eBusiness projects, but there was no evidence to support this view. What was thought more likely was that, it represented a bias in the experience level of the sample group or a reluctance to give details of failed projects.

Of the challenged projects: 40% were still on time, 53% were still within budget and 73% were still feature complete. Again this can be compared to Standish (2004) results of 18% on time, 57% within budget and 52%

feature complete. So the eBusiness projects seem to have a better record of being on-time and feature-complete than general IT projects. In this case there was also evidence to support this conclusion with eBusiness projects frequently using techniques such as time-boxing and the evolution of functionality which would encourage these results.

Critical Processes

The questionnaire asked the project managers to rate how critical to the success of a project they considered each of the 50 processes to be and whether or not they had used it on their project. Responses were scored on a scale of 1 to 5, with 4 being critical and 5 very critical. While all 50 processes had criticality means of between 4 and 5, the top-10 processes were selected based on their criticality means and percentage use as shown in Table 2.

Rank	Project Management Process	Mean	Used on %
1	Monitor and Control Project Work	4.81	100.0
2	Scope Change Control	4.77	80.8
3	Top management support	4.77	80.8
4	Acquire Project Team	4.76	84.0
5	Activity Resource Estimating	4.73	100.0
6	Integrated Change Control	4.73	84.6
7	Full user involvement	4.73	76.9
8	Preliminary Project Scope Statement	4.69	96.2
9	Schedule Control	4.69	92.3
10	Project Management Plan	4.69	84.6

Table 2: Top-10 Processes

It is worth noting that four of these critical process areas had not been identified by previous surveys: monitoring and controlling project work; acquiring the project team; control of the schedule; and producing a project management plan. It was felt that there was sufficient justification, and that a case could be made, for defining these as being specific to eBusiness projects.

The processes were further analysed to see if any correlation could be found between their use and the likelihood of project success. Two of these (top-management support and full user involvement) were already in the top ten above, the other five were:

- Project closure
- Issue management
- Communications planning
- Team empowerment
- Quality control

Methodologies

The most popular methodology in use turned out to be an in-house methodology as opposed to the use of PMBOK or PRINCE2 (see Figure 1). However, further investigation indicated that these in-house methodologies were often based, in whole or in part, on one or the other of these mainstream methodologies.

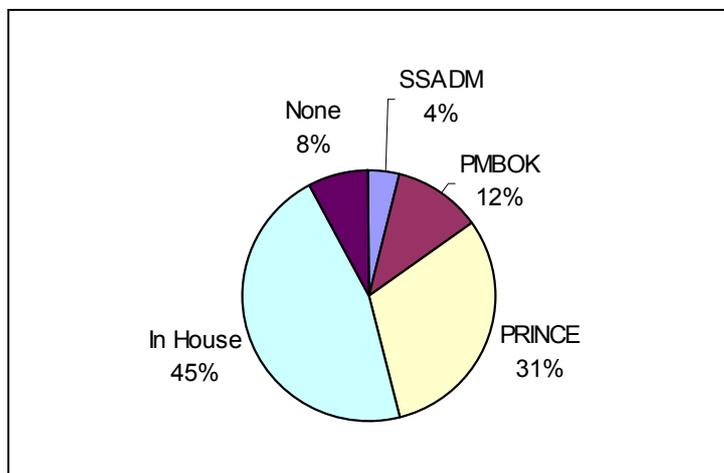


Figure 1: Project Management Methodology Used

Somewhat more surprisingly, 50% of the projects using an in-house methodology turned out successfully as compared to less than 10% of the projects using PMBOK or PRINCE2. We can assume that an organisation that has defined an in-house methodology will almost certainly be more supportive of the project management process and will be higher up the capability maturity model than one that has not. This in turn would suggest that better project resolutions could be expected in this environment, which may account for the difference.

Figure 2 shows the analysis of the software development life cycles (SDLC) used and again the surprise factor here was that nearly half of the projects still used the classic waterfall SDLC and a further 16% used a combination of waterfall plus RAD or spiral. In terms of the success ratio: 42% of the projects using classic waterfall were successful; compared to 33% of the projects using waterfall and RAD; and only 20% of the projects using RAD alone. There were no successful projects using incremental, evolutionary or spiral life cycles. So it would seem that the classic waterfall is still the most widely used and successful SDLC on eBusiness projects.

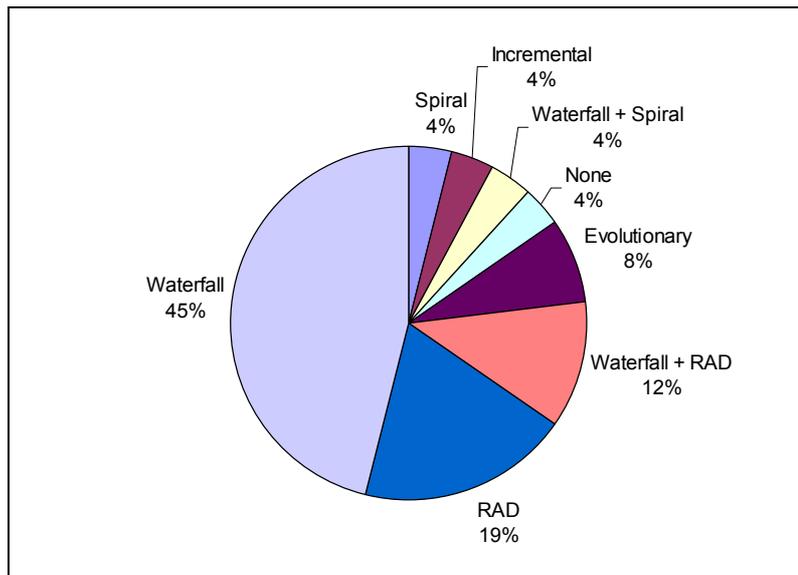


Figure 2: Software Development Life Cycles Used

Hypotheses

In addition to the basic research question, the study also set out to explore three hypotheses:

1. Firstly, that project managers would use the processes they believed to be critical to project success. This was fully supported by the data and the project managers in our sample did indeed use the processes they thought were most critical and they did not use the ones they thought were less critical, so no surprises there.
2. Secondly, there would be a positive correlation between the level of experience of the project manager and the success of the project. This was not supported by the data and in fact the less experienced project managers were just as likely, if not more so, to have a successful project. It should be noted that none of our project managers had less than two years experience and arguably first-time project managers would be most likely to run into problems. Nevertheless, it does show that length of experience on its own does not guarantee project success for an eBusiness project.
3. Finally, there would be an inverse relationship between the size of a project and the likelihood of success. This one had the most interesting results. The three items of size data (duration, work effort and number of people) were analysed into three bands (small, medium and large) each representing around a third of the projects. As expected there was indeed a higher rate of success on the small projects but, with the exception of duration, the large projects had a better success rate than the medium projects (see Table 3). Further study suggested that one possible reason could be that large projects have full-time resources allocated to them while medium projects are often staffed by part-time team members. This could lead to time conflicts and delays (time overruns representing the most frequent reason for a project being challenged). Whatever the reason, there was no such issue with project duration where short-duration projects (less than 6 months) were successful 50% of the time, medium-duration projects (6 to 9 months) were successful 40% of the time and there were no successful projects of over 9 months duration.

Size Criteria	Small	Medium	Large
Duration	50.0%	40.0%	0%
Work Effort	42.9%	14.3%	28.6%
No of People	50.0%	12.5%	33.3%

Table 3: Percentage of successful projects by size criteria

Conclusions

The most encouraging conclusion to be drawn from these results is that the traditional project management processes and methodologies (as defined by the PMBOK) are alive and well and just as relevant to eBusiness projects. The other major conclusions are:

- The top-10 critical processes for an eBusiness project have been identified and these include four processes that have not traditionally been associated with critical project success factors.
- Five additional processes have been shown to have a strong correlation to project success in an eBusiness project and their use is to be encouraged.
- The use of an in-house project management methodology coupled with the classic waterfall SDLC are the most likely to result in a successful eBusiness project.
- The duration of an eBusiness project is the most critical size factor and projects exceed nine months at their peril.

On the basis of these results, it is recommended that all organisations which have not yet defined their own project management methodology should consider doing so based on PMBOK and/or PRINCE2 best practice. That methodology should also incorporate guidelines of which the most significant is that eBusiness project duration should not exceed nine months.

From a personal perspective the author has been able to use these results to gain a better understanding of the project management of an eBusiness project, to develop an effective eBusiness project management course and define a service to assist organisations in implementing in-house project management methodology.

The full results of the survey are available at www.carroll.co.uk and for more information on any aspects of the study please email John Carroll at john@carroll.co.uk with your interest.

References

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