

What Makes Information Systems Projects Successful?

An essay by

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Abstract

This paper attempts to provide answers to the vexing question faced by organisations today – how to predict and measure success for investments made in Information Systems (IS). A significant portion of organisation capital and operating expenditure is consumed in IS today, and ensuring the delivery of return on the investment of this expenditure is crucial.

Unfortunately, many businesses today have no effective technique for predicting and ensuring the success of IS projects.

This paper provides a review of the literature examining the criteria for IS success, looking at two dimensions – Project Success and Product Success. A number of studies are examined and some recommendations provided which will enable business and IT management to tailor the project ecosystem to deliver successful resolution of the business problem addressed by the new Information System.

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Introduction

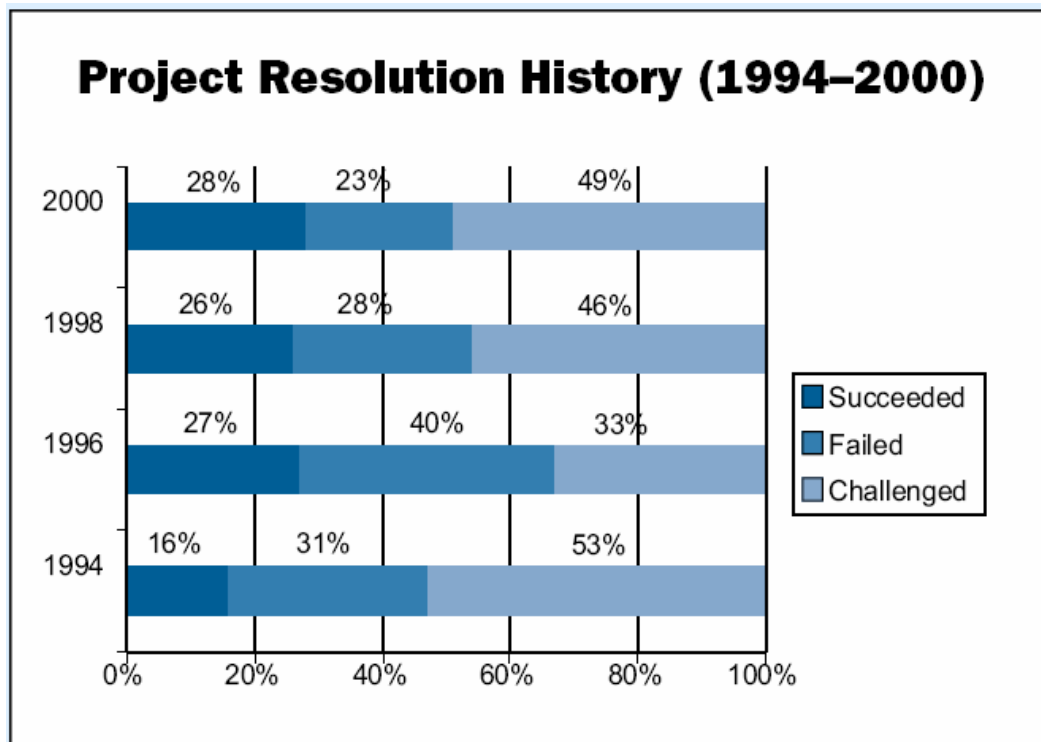
Worldwide Information Systems investment is projected to account for in excess of 2600 Billion US Dollars in 2006 (Gartner 2003). For the vast majority of organisations, IS expenditure is one of the largest investment items, however the history of IS projects indicates significant challenges in successfully attaining a return on many of the IS investment projects (Standish Group 2001).

This paper examines success in IS projects from an academic and practitioner perspective, reviewing the literature to present a picture of the current state as found in the Standish Group Chaos surveys conducted from 1994 to 2003, then examining various frameworks for measuring and predicting Information System PROJECT and PRODUCT success with an initial focus on the Delone & McLean Model of Success (Delone & McLean 2003), supplemented by the work of a number of other authors.

A set of recommendations is presented which could assist management in identifying projects that are likely to achieve success, and provide guidelines on changes to make in the project ecosystem (Highsmith, 2004) to make success more likely.

The Current State – IS Projects Measured

According to the Chaos Surveys, conducted every two years by the Standish Group (see www.standishgroup.com), IS projects have a dismal history with less than 30% of projects actually delivering on the original promise.



1: IS Project Success 1994-2000

The chart above (sourced from Standish Group 2001) is a view of project success over eight years and in excess of 30000 projects. A failed project is one that is cancelled before any return is received on the investment, and a challenged project delivers only some of the anticipated benefits.

Based on the Standish Group figures, success in IS projects is statistically unlikely.

Compounding the problem is the fact that many businesses today are totally dependant on Information Systems to enable them to conduct business, so IS projects must be successful if the organisation is to survive and prosper.

This results in a tension and pressure on IS implementations to deliver success in the face of unfavourable odds.

Faced with these pressures, it is important that IS stakeholders and implementers understand just what is meant by success.

Dimensions of Success – A Literature Review

What constitutes success? A variety of authors have defined success for IT projects using a myriad of metrics and definitions.

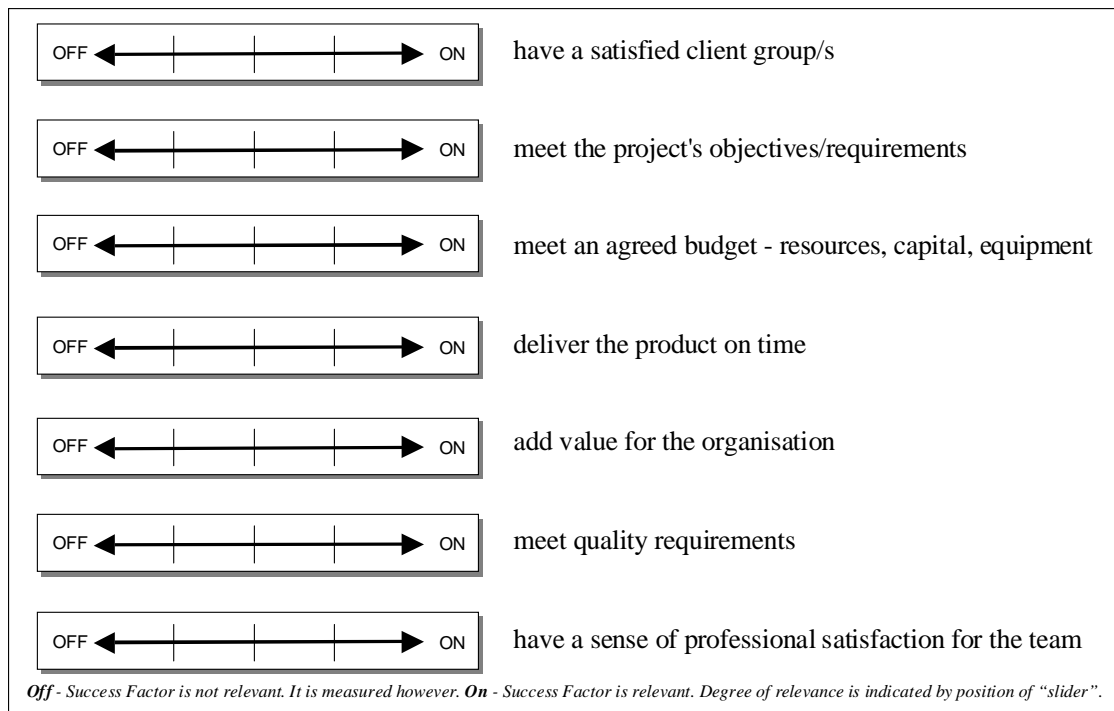
Careful examination of these measures result in a common set of success factors, which can be grouped into two broad areas, PROJECT Success and PRODUCT Success. These two groupings are defined below.

Project Success

Project Success is a measure of the effectiveness of the organisations processes for implementing new IS projects, up to the point of deployment of the new system to the end user community. This incorporates all the project related activities to ensure

- Project delivery on-time
- Project delivery on budget
- Project delivery of required features & functions
- Project delivery to the requisite quality standard

Rob Thomsett (2002) provides a framework for establishing and running an IS project, examining seven dimensions which need to be considered and balanced when implementing and running a project:



2 Thomsett Sliders

Project stakeholders need to assess these seven elements and decide which must be placed where relative to the others. The primary rule is that only one slider can be fully “on” – this will be the dimension that drives decisions, traded-offs and actions on the project.

Take, for example a Compliance type project, implemented to comply with a new piece of government legislation. The project profile will have either the Time (if there is a legislated date when the product must be deployed) or the Objectives/Requirements (legally defined set of requirements per the legislation which may not be deviated from) slider fully On. The other sliders will be set at lower values based on the other project drivers, but the legislative need will be the strongest factor in all decisions. (See Software Education Associates Ltd 2006 and Krutchen 2006 for a comprehensive discussion of the implications of these trade-offs on running projects).

Project success is only one element of overall Information System success. Provided the project does deliver a working product, the delivery of value to the organisation is

dependant on the successful integration of the new product into the organisation's business processes. For the purposes of this paper, this is referred to as Product Success and has been the focus of much of the academic literature.

Product Success

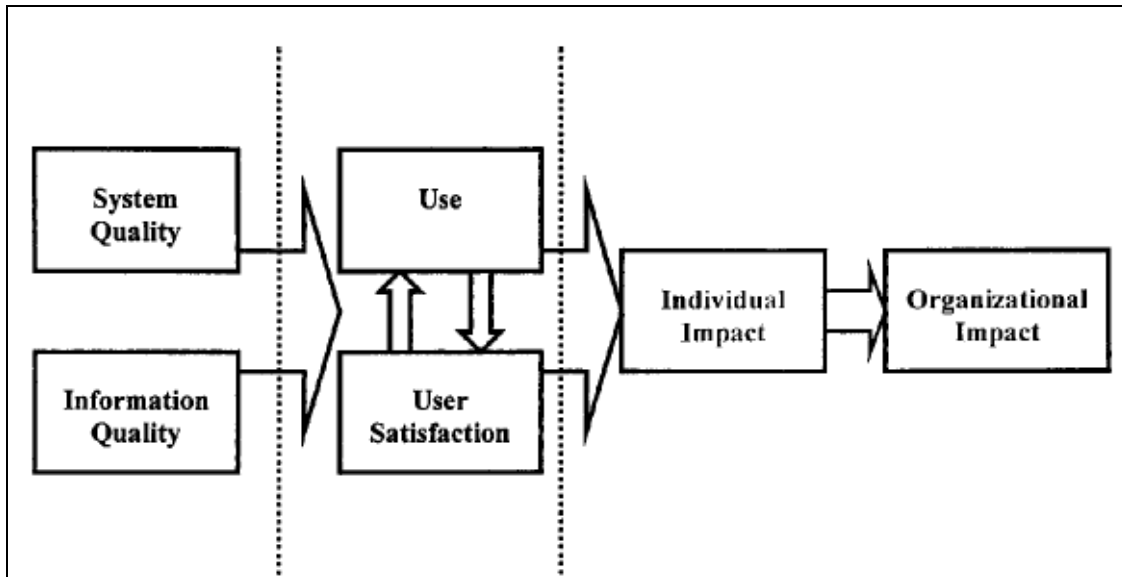
Product Success is the measure of the value the delivered system returns to the organisation, after completion of the project and when it is deployed to the eventual users to become part of the characteristic way business is conducted in the organisation (Software Education Associates Ltd 2006).

The most cited and widely used academic model for Information Systems success was presented by Delone & McLean in 1992 and updated by the original authors in 2002.

The Delone & McLean Model

The Delone & McLean model of Information System Success has been widely accepted in the academic literature as a powerful and effective representation of the factors which combine to create success in Information Systems (Delone & McLean 2002). By 2002, over 285 papers had referenced and cited the model in refereed journals and proceedings.

The original model proposed a number of causative relationships that together result in Organisational Impact being delivered from the implementation of an Information System. In the revised paper (Delone & McLean 2002) the original authors examine a number of studies which have attempted to validate the causative nature of the model and identify if the various factors do in fact follow in the sequence as proposed.



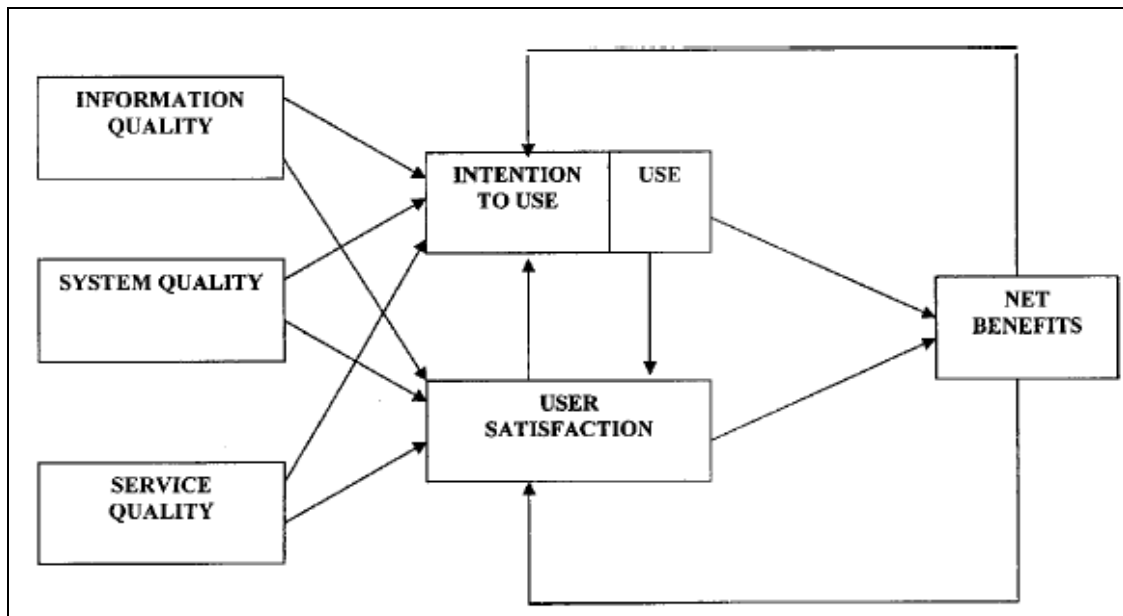
3 The Original Delone & McLean Success Model

The key dimensions defined in the original model that were shown to be causatively linked in the 2002 study are:

- System Quality → Individual Impact
- System Use → Individual Impact
- Information Quality → Individual Impact

Other links were found to be statistically validated and the authors conclude *“Taken as a whole, these empirical studies give strong support for the proposed associations among the IS success dimensions and help to confirm the causal structure in the model.”* (P15).

In their 2002 article, Delone & McLean extensively examined the research conducted over the preceding 10 years and identified significant enhancements to the original model, combining Individual and Organisational Impacts into a single “Net Benefits” category and adding a new factor of Service Quality, the revised model is shown in figure 4, below.



4 The Updated Delone & McLean Success Model

Delone & McLean (2002) further refine the definitions of the various factors when addressing the implication of the model with regard to E-Commerce systems:

- “System quality,” in the Internet environment, measures the desired characteristics of an e-commerce system. Usability, availability, reliability, adaptability, and response time (e.g., download time) are examples of qualities that are valued by users of an e-commerce system.
- “Information quality” captures the e-commerce content issue. Web content should be personalized, complete, relevant, easy to understand, and secure if we expect prospective buyers or suppliers to initiate transactions via the Internet and return to our site on a regular basis.
- “Service quality,” the overall support delivered by the service provider, applies regardless of whether this support is delivered by the IS department, a new organizational unit, or outsourced to an Internet service provider (ISP). Its importance is most likely greater than previously since the users are now our customers and poor user support will translate into lost customers and lost sales.
- “Usage” measures everything from a visit to a Web site, to navigation within the site, to information retrieval, to execution of a transaction.
- “User satisfaction” remains an important means of measuring our customers’ opinions of our e-commerce system and should cover the entire customer experience cycle from information retrieval through purchase, payment, receipt, and service.
- “Net benefits” are the most important success measures as they capture the balance of positive and negative impacts of the e-commerce on our customers, suppliers, employees, organizations, markets, industries, economies, and even our societies.

(pp24-25)

Delone & McLean are far from the only authors to have examined the success factors in IS implementation, the following section presents perspectives from other researchers and authors.

Other Viewpoints

A number of authors have taken the Delone & McLean model, incorporated it into their own research and expanded on the model with additional factors that are considered important for successful implementation of new Information Systems. See for example Adekoya (2005), Bokhari (2005), Bondarouk & Sikkel (2005), Chen & Chen (2004), Fisher & Howell (2004), Sugumaran & Arogyaswamy (2003). These authors identify two broad categorisations of success criteria, User Satisfaction and Technology Acceptance, Wixom & Todd (2005) provide a consolidated viewpoint that links these two streams of research into a single consolidated viewpoint.

A summary of the common factors from these authors is presented below:

- Effective technology that is accessible and understandable to the target audience
- Sustainable system that can be maintained and enhanced as the business needs evolve
- Design elements that are appropriate to the cultural and social makeup of the target audience
- Systems that align with the beliefs of the intended audience regarding usefulness and utility
- Systems that deliver accurate, useful and relevant information to the right stakeholders in an appropriately timely manner
- Realistic expectations of the benefits and characteristics of the new Information System
- Real and tangible benefits from the implementation of the Information System, including but not limited to:
 - Productivity improvement

- Service delivery improvement
- Service quality improvement
- Increased revenue
- Decreased cost
- Increased profits

Segars (1998) identifies the following additional factors that are considered important for product success:

- Ensuring there is alignment between the organisational strategy and the IS strategy, and that the product supports this strategy
- Effective analysis of the real business needs and identification of requirements that truly meet those needs
- Cooperation among all stakeholders in the implementation of the new product
- Ensuring that the new product does truly improve on the organisations capabilities in measurable and visible ways
- Adaptability, the new product must be adaptable to the organisations current and future needs, it must not be an anchor preventing future change

None of these perspectives is at odds with the Delone & McLean model, and can in fact be mapped to the different elements of the revised model with ease.

Building on these elements, it is possible to make some recommendations which general business and IT management should consider when implementing new Information Systems.

Recommendations

Project Success Factors

The Standish Group surveys provide a powerful framework for project success, which is updated with each survey. (Standish Group 1998, 2001) The latest “Chaos 10” framework identifies the following weighted factors for project success:

Executive Support	18
User Involvement	16
Experienced Project Manager	14
Clear Business Objectives	12
Minimized Scope	10
Standard Software Infrastructure	8
Firm Basic Requirements	6
Formal Methodology	6
Reliable Estimates	5
Other	5

Each factor has been weighted according to its influence on a project's success. The more points, the lower the project risk.

5 Standish Group Chaos 10 (2000)

IS implementation projects are dependant on a significant number of interrelated factors; these ten are not intended to be a comprehensive assessment of all the contributory

elements of IS implementation, but they do provide a valuable framework for predicting project success, and preventing the initiation of a “death march” project (Yourdon, 2004).

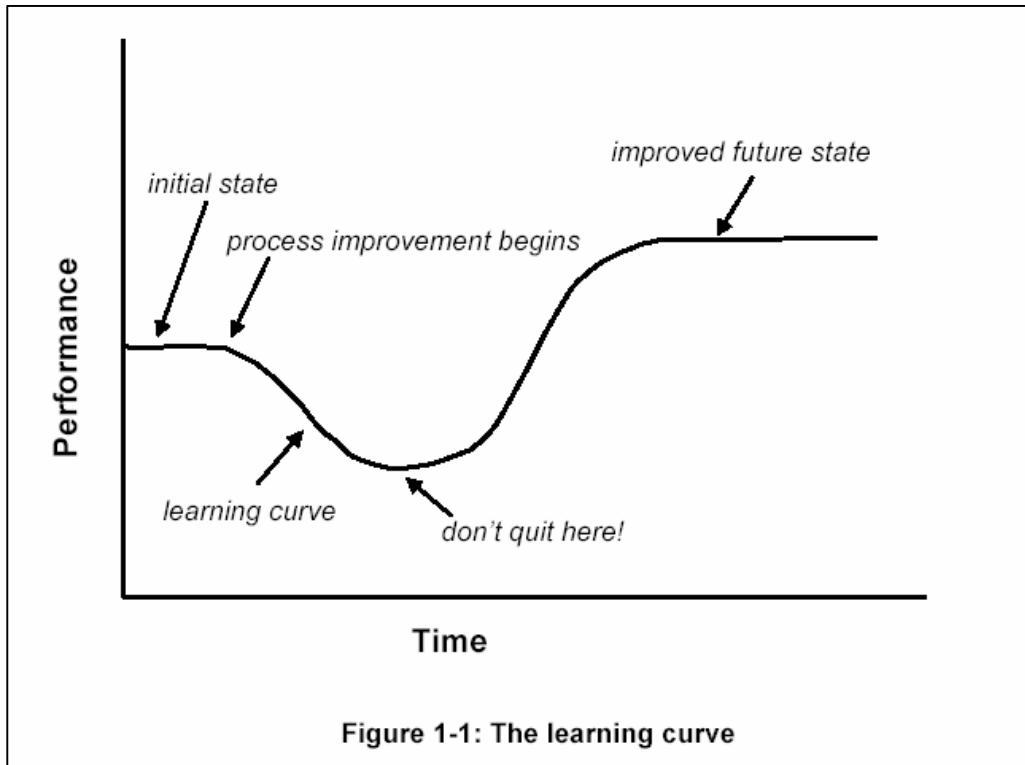
Yourdon (2004) provides a comprehensive analysis of a number of failed IS projects. He makes the very important point that *“In many death march projects, the most serious problems were not so much technical as they are political, social, cultural and people-orientated”* (p147). This echoes the Standish Group (1998) statement that *““What has become clear . . . is that people and process have a far greater effect on project outcome than technology.”*

People make projects successful. People are also primarily responsible for Product success. Managers responsible for initiating projects, and planning to achieve the resultant business benefits from successful product implementation need to ensure that the project ecosystem (Highsmith, 2004) is conducive to project success and the project team members are empowered to actually achieve success. Once the project has been successful, it is possible to then focus on the institutionalisation of the new product into the business processes of the organisation, and ultimately achieve the planned for benefits through product success.

Product Success Factors

One of the most important recommendations that can be made regarding the incorporation of a new Information System into the business processes of an organisation is the concept of “slack” (DeMarco, 2004) – time to assimilate the new way of doing things, and the mental space to adapt to the new reality.

Karl Wieggers (2005) presents a graphical viewpoint of what happens when organisations implement any process improvement initiative; there is an initial period where overall productivity decreases as the organisation assimilates the new way of doing things and adjustments are made to the way business is conducted.



6 The Productivity Curve

In addition to the breathing room to allow the new IS to become effective, it is important that all stakeholders approach the product implementation with mutual respect and an understanding of the realistic benefits the product can deliver.

The Delone & McLean model of IS Success is a framework that has been validated in numerous research articles, and one that can be effectively applied to the implementation of a new Information System.

Remember the advice from Robert Glass (2003) that unrealistic expectations, coupled with poor estimation, is one of the most significant causes of project failure.

Conclusion

This paper has presented a brief overview of some of the dimensions that constitute success in Information Systems projects. The topic has been investigated from the perspective of both Project Success (all the activities that are undertaken to create a new Information System) and Product Success – the activities and actions undertaken to incorporate the new Information System into the organisation’s “business as usual” processes. These two perspectives are inextricably linked in that the success of the product is impossible without first achieving project success, but there are two distinctly separate groups of stakeholders and participants whose interests and concerns need to be addressed and protected to enable the delivery of business benefits.

For Project Success, a number of studies have been examined that identify a framework which can be used, with an emphasis on the people factors in the project teams.

The Delone & McLean model of IS success has been examined as a framework for success in the implementation of the resultant product, the elements of this model have been validated as being important to the delivery of business benefits from the new Information System.

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* Note: Standish Group survey material obtained as part of the Software Education Associates Ltd course “Software Project Management”. See www.softed.com for details.

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