

Why Projects Fail

NASA's Mars Climate Orbiter Project

A High Tech, High Profile Failure

But the lessons learned are of value to all projects

Of interest to:

Principals, Vice-Chancellors, Senior Management, IT Managers,
Project Managers

Project Failure is an all too common phenomenon

We look at some of the reasons why.

Space Probes aren't very different from Student Systems

The fundamentals of project management apply to any scale of
project and they are ignored at your peril.

Projects are about People

The problems had little to do with technology and everything to do
with lack of sound project management.

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Why Projects Fail

NASA's Mars Climate Orbiter Project

In 1999 a Mars space probe from NASA was 'lost'. A number of the failures related to project management according to the report of the subsequent investigation.

The problems

There was one cause of the space probe loss that hit the headlines: two teams involved in the space probe development were using different systems of measurement – one was using metres, centimetres and kilogrammes, the other was using feet, inches and pounds.

However, the wide-ranging investigation into the failure came up with a number of other contributing factors:

- There had been inadequate consideration of the entire mission and its post-launch operation as a total system
- Communications and training within the project had been inconsistent
- There was no complete end-to-end verification of navigation software and related computer models

Actions taken

As a result, the culture of 'Faster, Better, Cheaper' was replaced with 'Mission Success First'.

Actions taken subsequently for another project, NASA's Mars Polar Lander, included:

- a new senior management leader was assigned
- work plans were freshly reviewed and augmented
- detailed fault tree analyses took place for pending mission events
- daily teleconferences took place to evaluate technical progress and plan work yet to be done
- the Deep Space Network for communications with the spacecraft was made available to more staff
- independent peer review of all operational and contingency procedures was introduced

Reasons for the failure

Clearly in this type of scientific project, there is little leeway in project outcomes and margins of error are small. The project had failed to set clear **success criteria** for the project outcomes.

The **scope of the project** had not been matched to the funding, leading to inadequate funding for defined outcomes.

The project was judged to be lacking in good **team working** and **adequate and appropriate staffing**. The problem was found to be poor communication between, rather than within, different teams. In particular the report called for better monitoring of the work of contractors. Better trained personnel were required, and project management courses were part of this recommendation.

There was inadequate **risk management** and **issue control**. The report recommended that

future projects should conduct continuous risk analysis and discussion of issues from start to end of the project. NASA needed to foster a climate in which issues could be easily raised.

Minimising risk was also behind recommendations that in future NASA should plan long-term for a different type of **technological innovation**, focussing on smaller, low-risk products that could then be incorporated into wider projects.

Reference: Report on 'Project Management in NASA' by the Mars Climate Orbiter Mishap Investigation Board at: http://www.dcs.gla.ac.uk/~johnson/Mars/MCO_MIB_Report.pdf)

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