

Sources of Resource Risk

Like schedule risks, resource risks represent less than one third of the records in the PERIL database. Resource risks have an average impact of nearly seven weeks, intermediate between scope and schedule risks. There are three categories of resource risk: *people*, *outsourcing*, and *money*. People risks arise within the project team. Outsourcing risks are caused by using people and services outside the project team for critical project work. The third category, money, is the rarest risk subcategory for the PERIL database, as very few of the problems reported were *primarily* about funding. Money, however, has the highest average impact and the effect of insufficient project funding has substantial impact on projects in many other ways. The root causes of people and outsourcing risk are further characterized by type, shown in this summary:

Resource Root-Cause Subcategories	Definition	Count	Cumulative Impact (Weeks)	Average Impact (Weeks)
Money: Limitation	Slip due to funding limits	17	228	13.4
Motivation	Loss of team cohesion and interest; often on long projects	8	69	8.6
People: Late Start	Staff available late; often due to delayed finish of earlier projects	15	115	7.7
Outsourcing: Late or Poor Output	Deliverable late from vendor. Includes queuing, turnover	34	260	7.6
People: Loss	Permanent staff member loss due to resignation, promotion, reassignment, health, etc.	40	277	6.9
People: Queuing	Slip due to bottleneck (includes specialized equipment)	27	117	4.3
Outsourcing: Delayed Start	Contracting related delays	13	56	4.3
People: Temporary Loss	Temporary staff loss due to illness, hot site, support, etc.	33	128	3.9

A Pareto chart of overall impact by type of risk is in Figure 5-1. Although risks related to internal staffing dominate the listed resource risk subcategories, both outsourcing and money risks are included in the top three.

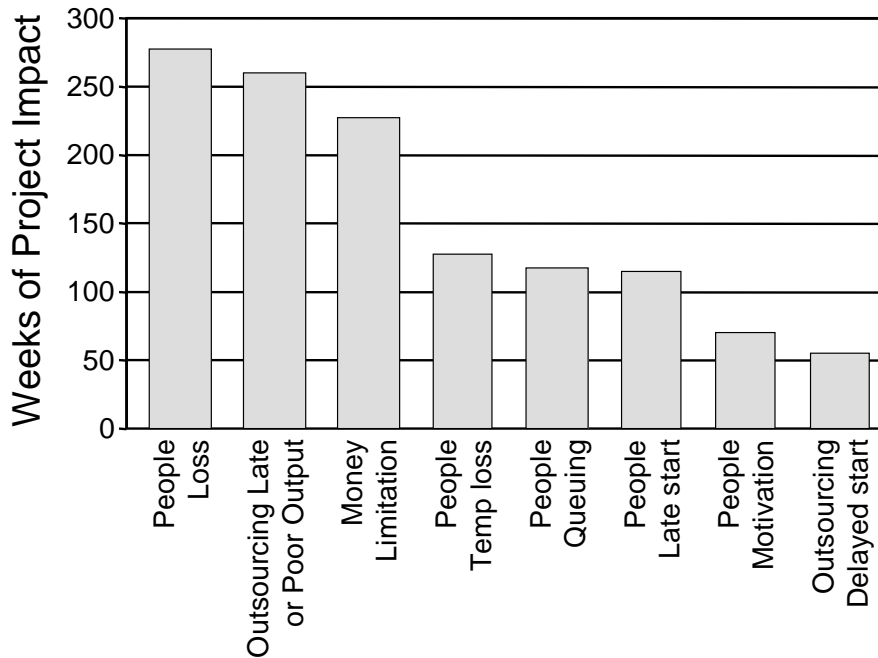


Figure 5-1: Total Project Impact by Resource Root-Cause Subcategories

People risks

Risks related to people represent the most numerous resource risks, comprising almost 20 percent of the entire database and nearly two thirds of the resource category. People risks are subdivided into five subcategories:

- *Loss*: Permanent staff member loss to the project due to resignation, promotion, reassignment, health, or other reasons
- *Temporary loss*: Short-term staff loss due to illness, hot site, support priorities or other reasons
- *Queuing*: Slip due to other commitments for needed resources or

expertise

- *Late start:* Staff not available at project start; often due to late finish of previous projects
- *Motivation:* Loss of team cohesion and interest; typical of long projects

Loss of staff permanently had by far the highest overall impact, resulting in an average slip of almost seven weeks. Permanent staff loss represented about one third of the people risks. The reasons for permanent staff loss included resignations, promotions, reassignments to other work or different projects, and staffing cutbacks. Discovering these risks in advance is difficult, but good record-keeping and trend analysis are useful in setting realistic project expectations.

Temporary loss of project staff was the next most common people-related risk, with roughly another third of the total. Its overall impact was lower than for permanent staff loss, causing an average slip of nearly four weeks. The most frequently reported reason for short-term staff loss was a customer problem (a “hot site”) related to the deliverable from an earlier project. Other reasons for short-term staff loss included illness, travel problems, and organizational reorganizations.

Queuing problems were about 20 percent of the people-related risks in the PERIL database. The average schedule impact due to queuing was just in excess of four weeks. Most organizations optimize operations by investing the bare minimum in specialized (and expensive) expertise, and in costly facilities and equipment. This leads to a potential scarcity of these individuals or facilities, and contention between projects for access. Most technical projects rely on at least some special expertise that they share with other projects, such as system architects needed at the start, testing personnel needed at the end, and other specialists needed throughout the project. If an expert happens to be free when a project is ready for the work to start, there is no problem, but if he or she has five other projects queued up already when your project needs attention, you will come to a screeching halt while you wait in queue. Queuing analysis is well understood, and it is relevant to a wide variety of manufacturing, engineering, system design, computer networks, and many other business systems. Any system subject to queues requires some excess capacity if it needs to increase throughput. Optimizing organizational resources needed for projects based only on cost drives out necessary capacity and results in project delay.

Late starts for key staff unavailable at the beginning of a project also caused a good deal of project delay. While the frequency was only a little more than 10 percent of the people-related resource risks, the average impact was nearly eight weeks. Staff joining the project late had a number of root causes, but the most common was a situation was aptly described by one project leader as the “rolling sledgehammer.” Whenever a prior project is late, some, perhaps even all, of the staff for the new project is still busy working to get it done. As a consequence, the next project gets a slow and ragged start, with key people beginning their contributions to the new project only when they can

break free of an earlier one. Even when these people become available, there may be additional delay, because the staff members coming from a late project are often exhausted from the stress and long hours typical of an overdue project. The “rolling sledgehammer” creates a cycle that self-perpetuates and is very hard to break. Each late project causes the projects that follow also to be late.

Motivation issues were the smallest subcategory, at only a bit more than 5 percent of the people-related resource risks. However, these risks had an average impact of nearly nine weeks, among the highest for any of the subcategories in the PERIL database. Motivation issues are generally a consequence of lowering interest on very long duration projects, or due to interpersonal conflicts.

Thorough planning and credible scheduling of the work well in advance will reveal some of the most serious potential exposures regarding people. Histogram analysis of resource requirements may also provide insight into staffing exposures a project will face, but unless analysis of project resources is credibly integrated with comprehensive resource data for other projects and all the non-project demands within the business, the results will not be very useful. Aligning staffing capacity with project requirements requires ongoing attention. One significant root cause for understaffed projects is little or no use of project planning information to make or revise project selection decisions at the organization level, triggering the “too many projects” problem. Retrospective analysis of projects over time is also an effective way to detect and measure the consequences of inadequate staffing, especially when the problems are chronic.

Outsourcing risks

Outsourcing risks account for more than a quarter of the resource risks. Though the frequency in the PERIL database is lower than for people risks, the impact of outsourcing risk was nearly seven weeks, about equal to the database average. Risks related to outsourcing are separated into two subcategories: *late or poor outputs* and *delayed start*.

Late or poor output from outsource partners is a problem that is well represented in the PERIL database. The growth of outsourcing in the recent past has been driven primarily by a desire to save money, and often it does. There is a trade-off, though, between this and predictability. Work done at a distance is out of sight, and problems that might easily be detected within a local team inside the organization may not surface as an issue until it is too late. Nearly three quarters of the outsourcing risks involved receiving a late or unsatisfactory deliverable from an external supplier, and the average impact for these incidents was nearly eight weeks. These delays result from many of the same root causes as other people risks—turnover, queuing problems, staff availability, and other issues—but often a precise cause is not known. Receiving anything the project needs late is a risk, but these cases are compounded by the added element of surprise; the problem may be invisible until the day of the default (after weeks of reports saying, “Things are going just fine...”), when it is too late to do much about it. Lateness was often exacerbated in cases in the PERIL database because work that did not meet specifications caused further delay

while it was being redone correctly.

Delayed starts are also fairly common with outsourced work, causing about one quarter of the outsourcing problems. Before any external work can begin, contracts must be negotiated, approved, and signed. All these steps can be very time consuming. Beginning a new, complex relationship with people outside your organization can require more time than expected. For projects with particularly unusual needs, just finding an appropriate supplier may cause significant delays. The average impact from these delayed starts in the database was just over one month.

Outsourcing risks are detected through planning processes, and through careful analysis and thorough understanding of all the terms of the contract. Both the project team and the outsourcing partner must understand the terms and conditions of the contract, especially the scope of work and the business relationship.

Money risks

The third category of resource risks was not very common in the PERIL database, representing less than 10 percent of the resource risks and about 2 percent of the whole. It is significant, however, because when funding is a problem, it is often a big problem. The average impact was the highest for any subcategory, at over 13 weeks. Insufficient funding can significantly stretch out the duration of a project, and it is a contributing root cause in many other subcategories (people turnover due to layoffs and outsourcing of work primarily for cost reasons, as examples).

Black swans

The worst 20 percent of the risks in the PERIL database are deemed “black swans.” These “large-impact, hard-to-predict, rare events” caused at least three months of schedule slip, and 33 of these most damaging 127 risks were resource risks. As with the “black swans” as a whole, the most severe of the resource risks account for about one half of the total measured impact. The details are:

Resource Risks		Total Impact (Weeks)	“Black Swan” Impact (Weeks)	“Black Swan” Percentage
Money	Limitation	228	174	76%
Outsourcing	Delayed start	56	12	21%
	Late or poor output	260	152	58%
People	Late start	115	58	50%
	Loss	277	101	36%
	Motivation	69	53	77%
	Queuing	117	50	43%
	Temp loss	128	12	9%
Totals		1,250	612	49%

As can be seen in the table, the “black swan” resource risks were distributed unevenly. The money category represents a much higher portion of the total, with outsourcing about as expected and people-related risks much lower.

Not surprisingly, **money** issues were a substantial portion of the “black swan” resource risks. Eight cases, more than half of the risks reported in this category, were in this group, including such problems as:

- Project budget was limited to the bare minimum estimated.
- Important parts of scope were missed due to insufficient resources.
- Not enough staff was funded to cover the workload.
- Major cut backs delayed fixes that lost time and ultimately also cost a lot of money.
- Only half the resources required were assigned to the project.

There were also ten **outsourcing** “black swan” risks. Nine were due to late or poor output, with these among them:

- The vendor was unable to control the subproject and the work had to be redone.
- The supplier was purchased and reorganized; the project had to find a new supplier.
- Outsourced research work was not managed well, and all work was ultimately redone.
- Changes were agreed to, but the supplier shipped late and it failed.
- The subcontractor failed to understand technology and requirements.
- The partner on the project defaulted.
- The supplier was not able to meet deadlines.

There was also a “black swan” outsourcing risk due to a delayed start when settling the terms of the agreement and negotiating the contracts took months and caused the project to begin very late.

There were 15 additional “black swan” **people** risks. This category had a smaller proportion of severe risks but did have the largest total number of these severe risks.

The three “black swan” risks associated with motivation were over one third of all the motivation risks, and they account for nearly 80 percent of the impact from this category of risk. These risks were:

- Management mandated the project but never got team buy-in.
- Staff got along poorly and frequently quarreled.
- The product manager disliked the project manager.

Permanent staff loss also caused a lot of pain and led the list of “black swan” people risks with five examples:

- A key staff member resigned.
- The committed medical expert was no longer available.
- Staffing suffered cutbacks.
- Specialists were lost, including designers, business analysts, and QA/testers.
- There was a company-wide layoff.

There were also three “black swan” project risks due to queuing, where projects were slowed by lack of access to specific resources:

- Insufficient QA resources were available to cover the auditing tasks and training tasks.
- Key decisions were stalled when no system architect was available.
- Several projects shared only one subject matter expert

There were three more major people risks caused by late staffing availability. All were due to people who were trapped on a delayed prior project. Temporary loss of people caused only one “back swan” risk, due to an unexpectedly early start of conflicting peak-season responsibilities that resulted in a protracted loss of project staff.