

**Table 7**

Problems, decisions, reasons, and causes.

Phase	Case A	Case B	Case C	Case D	Case E
Requirements		X		X	
Design	XR	XDR	X	XC	X
Coding	XD		X	XD <sup>a</sup>	X
Testing			X	D <sup>a</sup> R	XD
Project management	X	X	X	X	
Poor quality and/or missing features		R	D <sup>b</sup> R		R

X: problems; D: cancellation decision; R: reason given in the cancellation decision; C: cause of the reason.

<sup>a</sup> In Case D the decision was made during prototyping with real-world data.<sup>b</sup> In Case C the cancellation decision was made after the project had ended.

phase after the first prototype was tested with real data. The reason for cancelling the project is one of the technical reasons for terminating research and development projects discussed in Kumar et al. (1996). The cause of the cancellation was the unsuitability of the selected architecture for the situation, and this was not noticed before the system was tested with real data.

The reason for cancelling the project in Case E was a combination of poor quality, exceeded budget, and exceeded schedule. Further analysis of the perceived poor quality showed that the software was not technologically up to the use for which it was intended. After several buggy versions had been produced and the schedule had been exceeded, the customers lost patience and decided to drop the project, which caused a disastrous impact on the supplier, leading to bankruptcy. The cancellation decision was made during the testing phase of an iterative development cycle.

Table 7 shows a summary of the problems encountered during the project, the cancellation decision, the reasons for the cancellation, and the possible cause of the cancellation. The table has an additional row showing whether there were features missing or quality problems in the project. It is notable that in only one case could the cause be identified as something that had taken place during the project. In other cases we were not able to identify something that had taken place during the project as being the cause of the cancellation reason.

The reasons for the cancellation decisions included poor quality, exceeded schedules, exceeded costs, and technologically inadequate software. These reasons do not provide any surprises, but it was surprising that the question why those failures happened was very difficult to answer in any meaningful sense when we considered only the project. Only by tracking the cause of the cancellation reason backwards in time were we able to identify that cause. However, we were able to identify the cause of the cancellation reason only for Case D, in which the selection of an unsuitable architecture made the actual cancellation reason (the slowness of the system) manifest itself later.

In other cases it was not possible to identify the cause of the cancellation reason from the normal project documentation. Therefore we had to expand our analysis to cover all project documentation. The results of that analysis are presented in the next section.

## 6. Doomed to fail or what happened before the project started?

### 6.1. Causes of the failures

In the previous section we analysed the cases and noted that the root cause of the cancellation decision was identified only in Case D: other cases did not provide relevant explanations. In this section we present the other cases and discuss the causes of the reasons for the cancellation decisions.

When trying to identify the causes of the cancellation reasons of other four cases, we summarized our observations thus:

1. the cause that made the reason for the cancellation decision valid seemed to exist from the beginning of the project;
2. we were not able to discover all the important reasons for the project cancellations by looking at the phases of the project; therefore
3. the cause had come into existence before the project started.

These observations made it clear that the cancellations of these cases cannot be sufficiently explained by something that can be clearly identified as belonging to a specific project phase. The conditions responsible for the actual cancellation reason seemed to be present in the project from its beginning, and therefore not explainable by anything that took place during the project itself. Consequently, we took a closer look at the part of the project documentation that had been classified as belonging to the pre-project phase in order to find out what happened before the project actually started. The events of each case are briefly described in the following paragraphs.

The project to tailor an existing system to fulfill the requirements of a competent and knowledgeable customer, Case A, turned out to have design problems that could not be expected to be solved in a reasonable time and with reasonable costs. Those problems were the reason for the cancellation decision, although problems with coding and project management were also present. However, the fatal problem – the unsuitability of the architecture of the existing system – lay behind the other problems. The project was doomed from the start, but why?

The customer had created a detailed description of the target system before contacting any supplier. That description consisted of process descriptions and detailed specifications of the required functionality. After creating the documentation, the customer made a survey of the market and contacted promising-looking suppliers. The customer started negotiations with one supplier and requested a detailed tender.

After comparing the requirements provided by the customer and the issues covered in the tender, it was clear that the tender had been created without any real understanding of the material provided by the customer. Some of the critical and very complicated requirements provided by the customer were not explicitly covered in the tender, which was created in a way that assured the customer that the requirements would be satisfied with a reasonable amount of changes to be made to the existing product sold by the supplier. The agreement was based on the tender.

The fiasco in Case A was unavoidable after the agreement had been signed. The supplier had made a mistake in making an unrealistic tender, and the project could not be saved regardless of all the efforts of the supplier or the customer. The fatal mistake was to offer a solution that was not doable in any reasonable way.

It is not possible to say exactly why the supplier in Case A offered an unsuitable solution. We have to conclude that for some reason the supplier did not pay enough attention to the requirements documentation created by the customer. If the supplier had read carefully the material provided by the customer and understood

the requirements, it is unlikely that the supplier would have made the tender at all.

In Case B the project was introduced to the customer by the supplier's representatives. The customer understood the significance of creating an overall architecture and asked several suppliers to provide tenders. The supplier that had suggested the idea was selected. This tender named several very competent people as the project team. The agreement was based on that tender.

The problems in Case B can be traced to the time between the date of the tender and the start of the project. The people named in the tender were very competent and would surely have been able to handle the project without any problems. However, when the project started, these people were not available, because they had been appointed to other projects before the start of the project. Therefore, one of the tasks of project managers, namely making sure that the right people are in the right jobs (Moore, 1999), was out of the control of the project manager. The supplier had to use less experienced people for a very demanding project. Problems were inevitable, and the cause of the cancellation can be identified as the staffing decision.

In Case C the customer had made an internal decision to replace an existing system with a completely new one. The customer created a good analysis of the target system before inviting tenders from several suppliers. Only one of the tenders was interesting to the customer, who negotiated an agreement with the supplier. In the agreement, the price of the project was the same as in the original tender, but the proposed timetable was shortened fairly dramatically because the upper management of the customer wanted the project to be completed as soon as possible.

The schedule was fixed in the agreement and was deemed doable but clearly too ambitious by the experts on both the customer and the supplier side. Although the schedule was tight, the supplier acceded to the desires of the customer's upper management, and both parties signed an agreement with that tight schedule. We assume that the reason why the supplier agreed to the schedule was the fact that the customer did not haggle over the price quoted in the tender. It could be that the profit-oriented optimization of the supplier's project portfolio won over caution. That is fairly understandable if we consider the optimization of the sales and delivery project portfolio in the sense presented by Tikkanen

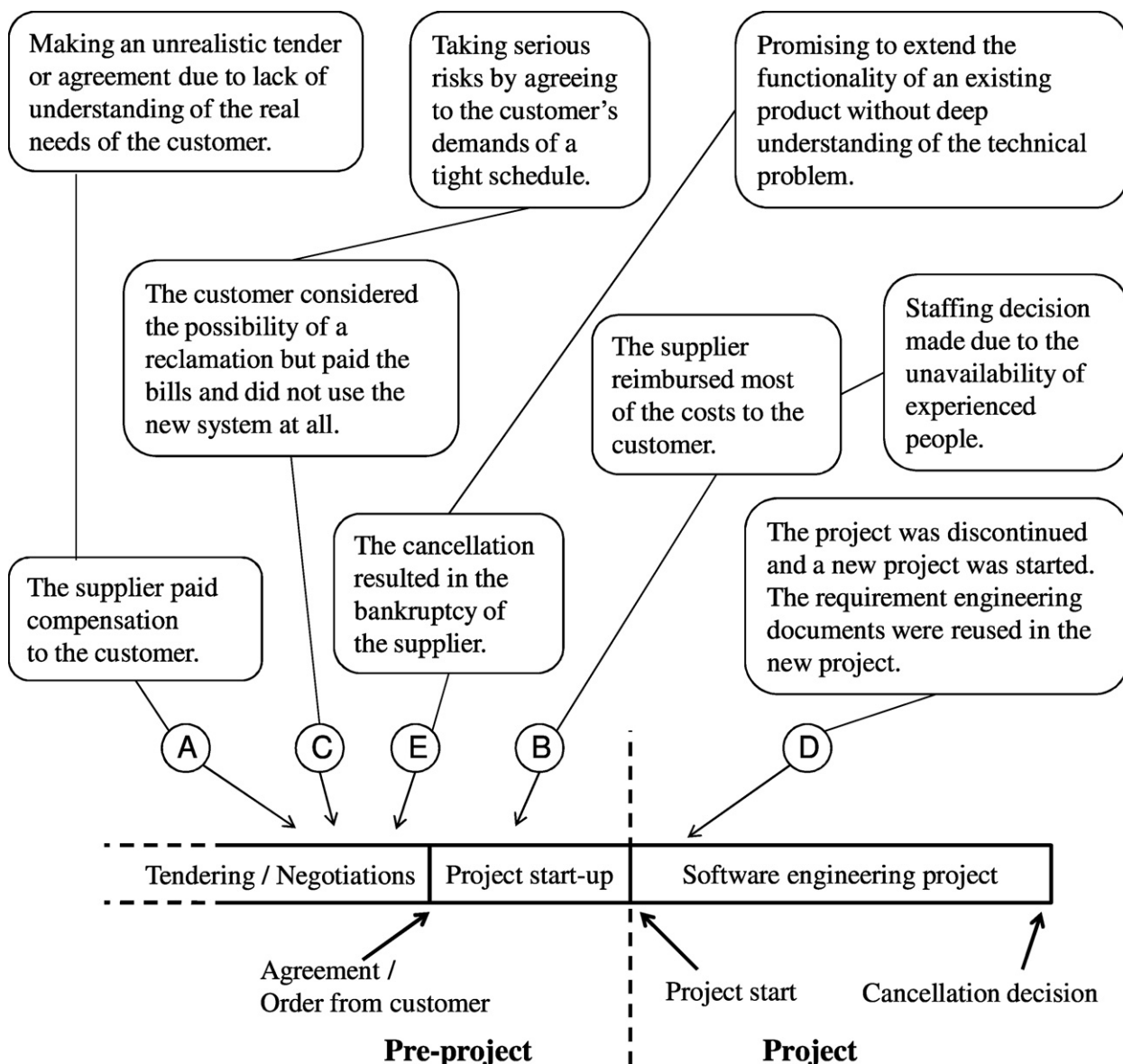


Fig. 1. The timing of the mistakes.