CHAPTER 9 PROTOTYPE DEPLOYMENT

9.1 Introduction

This chapter describes the trial usage of the system by a group of end users and presents an overview of the trial usage process and details on the actual trials. A summary of the results of these trials including the feedback provided by users is also presented.

There are several reasons for conducting user trials of the system. Firstly, it exposes the system to ‘real world’ project managers and obtains feedback from them in relation to the systems functionality and advice. In addition, it provides a mechanism to elicit opinion from users as to the added value of the system as compared to traditional project planning systems. It should be noted that it was not the purpose of these trials to provide a comprehensive in-depth test of the system, but rather to gain an appreciation of user perception of the system - its usefulness and added value.

9.2 Trial Usage Process

The user trial process was conducted in two main phases:

- **Phase 1** - involved the P3 member organisations using the prototype system as described in chapter 8. It was conducted over an eight month period and contained four sets of user trials - one for each of the major prototype releases.

- **Phase 2** - involved non-P3 organisations using the pre-commercialisation beta version of the system. It was conducted over a two month period and contained two sets of user trials.

The six trials are summarised in table 9.1 below:
<table>
<thead>
<tr>
<th>Trial</th>
<th>Version</th>
<th>Users</th>
<th>Main Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Noumea</td>
<td>10 users from 1 P3 partner organisation.</td>
<td>Test the user interface with respect to data capture.</td>
</tr>
<tr>
<td>2</td>
<td>Salonika</td>
<td>6 users from 2 P3 partner organisations.</td>
<td>Test scenarios and generated advice associated with them.</td>
</tr>
<tr>
<td>3</td>
<td>Burgundy</td>
<td>11 users from 2 P3 partner organisations.</td>
<td>Test the total functionality of the system and quality of the advice produced by the system.</td>
</tr>
<tr>
<td>4</td>
<td>Tipperary</td>
<td>9 users from 2 P3 partner organisations.</td>
<td>Test the total functionality of the system and quality of the advice produced by the system.</td>
</tr>
<tr>
<td>5</td>
<td>Pre-commercial beta prototype</td>
<td>5 users from 4 non-P3 organisations.</td>
<td>Additional feedback from non-P3 project organisations.</td>
</tr>
<tr>
<td>6</td>
<td>Pre-commercial beta prototype - same version as used in trial 5</td>
<td>4 users from 4 non-P3 organisations.</td>
<td>Additional feedback from original tool users survey participants.</td>
</tr>
</tbody>
</table>

Table 9.1 - Overview of User Trials

Each of the trials consisted of three main steps:

1. A formal presentation given to the trial participants to introduce the scope and nature of the system.
2. A period of actual usage of the tool by the participating users from which a trial usage report was produced.
3. A review meeting involving all trial participants in which the trial usage report was discussed and analysed.

The actual usage of the tool consisted of one or more of the following steps, depending on the prototype version being used and the individual user:

- Creation of a fictitious project to allow experimentation with the system.
- Selection of a recent (previous) project and the creation of a project plan for it using the system, including a comparison of the two plans.
- Selection of a new or forthcoming project and the creation of a project plan for it using the system.
- Creation of a project plan for a supplied case study (see Appendix C).

At the end of each trial, the users were required to formally document their findings in a trial usage report and specifically to consider the tool under headings such as:

- Defining and refining a project plan.
- Creation and manipulation of project plan scenarios.
- Advice produced by the system while conducting the above.
- Suitability of the decision support framework provided by the system.
- Comparison in relation to other project planning tools used.
- Interaction issues such as GUI look and feel, etc.

The following six sections will present the main findings of the each of the trials. For each trial a high level view of its participants, duration and objectives is given. A summary of the main finding of each trial usage report which are pertinent to the objectives of this research are presented. For the sake of clarity, details on issues such as the GUI and installation program are not presented.

### 9.2.1 Trial 1

<table>
<thead>
<tr>
<th>Trial</th>
<th>Trial 1 using Noumea prototype.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User details</td>
<td>Ten staff from various departments of one P3 organisation. These included software developers, project managers and quality managers.</td>
</tr>
<tr>
<td>Duration</td>
<td>Trial conducted over a three day period.</td>
</tr>
</tbody>
</table>
| Objectives | • Assess user perception of added value of an intelligent assistant system as compared to traditional project planning tools.  
• Evaluate user understanding of the tokens used to characterise |
Main finding of trial usage report

- Generally, users considered that the system appeared to provide a good framework for supporting decision making - although much of the detailed functionality had not yet been implemented. They considered the tool provided a novel approach to decision making and had the potential to be of use in a commercial setting.
- They also noted that the tool was not a replacement for decision making by the project manager, but potentially a useful aid to support the decision making process.
- Users suggested that the system could be used from two complementary perspectives depending on a persons job function: The first could be for the quality manager who defines an organisations good practices from those of state-of-the-art and locally used standards. The second could be the person in charge of a project who applies these defined practices.
- The users considered that the overall success of the system was directly linked to the quality (suitability, understandability, etc.) of the advice it offered. Some participants noted that they would be disappointed if the tool only provided general or non-pertinent advice.
- Users considered it important to have a balance between the requested information by the user and the automated provision of information so the user will not be swamped with information.
- The perception of a number of participants was that the system could be viewed as a complementary tool to other existing project support tools, such as PSN6. It would therefore be desirable to have links between these tools and also to spreadsheet packages.
- Generally the tokens (project parameters) were easily understood by users. A small number of them were not understood or were considered not to be valid in a particular project / product context.
- The prototype was difficult for users to evaluate as it only
contained a basic element of the main functionality of the system. Additionally, as the prototype only contained a small number of simplistic agents, users commented that they were unsure about the exact nature of the advice as it would appear in future prototypes.

Table 9.2 - Summary of Trial 1

This trial was very important as it was the first time the system was exposed to end users. Therefore, of principal concern was user reaction to the approach and framework provided by the system. The majority of users responded in a positive manner to the framework, however, it should be noted that the prototype system used in this trial contained only the basic functionality of the system. Because of this, some of the users comments may have been based on their perception of what the fully functioning system would provide from the perspective of the presentation made to them and the partially functional prototype used as the basis for the trial.

Many of the users specific comments were based on the fact that the prototype (as evaluated by them) only contained some of the main functional services to be provided. In retrospect, this may have been caused by inappropriate guidance during the initial presentation session. The specific comments and concerns of this group were considered valid and were taken into account in the development of the third prototype, although some requests, such as an export facility were considered to be outside the scope of the early prototypes.

The second trial session was based on a substantially more complete prototype - for example, scenario support was not included in the prototype for the first trial. This additional functionality allowed trial participants to get a more complete picture of the decision support framework provided by the system.

9.2.2 Trial 2
<table>
<thead>
<tr>
<th>Trial</th>
<th>Trial 2 using Salonika prototype.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User details</td>
<td>Six staff from two P3 partner organisations.</td>
</tr>
<tr>
<td>Duration</td>
<td>Trial conducted over a two week period.</td>
</tr>
</tbody>
</table>
| Objectives | • The main goal of this prototype was the development of scenario support, therefore the emphasis was on obtaining user feedback on scenario usage and associated advice generated in scenarios.  
• Assess users attitudes towards the nature and type of advice being offered by the agents.  
• Gain additional user feedback with respect to the user interface, having taken account of the changes made since the last prototype.  
• As with the previous trial, assessing user perception of the added value of the system was an important issue. |
| Main finding of trial usage report | • This review confirmed the report from the first trial that the system was generally considered to provide a good framework for supporting decision making and the system had the potential to be of use in a commercial setting.  
• Users considered a strength of the system was that it could provide guidance and assistance on the “good rules of planning” by providing a clearly defined way of building a project.  
• Users also remarked that the system acted as a “planning reminder”, in that its approach provided a subtle mechanism to remind or prompt users about certain actions or issues to be considered in a plan which they may have inadvertently omitted. This facility may be of use to both new / inexperienced and experienced project planners.  
• In general, users considered that the use of scenarios to develop alternative views and paths through a project was useful. They considered it was useful to simulate variants of a plan and suggested that for most projects the capability to create five fundamentally different scenarios would be sufficient.  
• A number of specific comments and suggestions were made in relation to improving the mechanism by which scenarios are... |
developed for a project.

- Participants expressed a need for the system to offer guidance on the selection of the most appropriate lifecycle for a project.
- Many of the users considered the advice given by the agents to be general and not sufficiently specific. Some of the users expected the advice to be presented in a more conversational format and make explicit reference to the specific values associated with a particular scenario.
- Users requested that the advice displayed should be permanent (for the duration of a session) so users can see an advice history. The advice was considered by users to contribute to their overall understanding of a project and also assisted with the evaluation of risk to the project.
- There were issues relating to a duplication of advice being offered during any one user session. Users considered this could be a distraction from important issues.
- A small number of users commented that it would also be useful if some advice was expressed in more quantitative terms (for example, 70% probability of the project failing in a specific issue).
- Some users expressed the desire for the system to provide support for the on-going tracking of a project during its execution and not just during the planning phase.

<table>
<thead>
<tr>
<th>Table 9.3 - Summary of Trial 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>This trial was important as it was the first version of the tool to contain scenario support and a number of realistic agents. Further, this trial was conducted using a wider audience and over a longer time frame. The general comments of the users were very supportive of the concept of a support tool as they considered it a novel approach to planning by comparison to existing systems. At the review meeting there was substantial discussion on the possible usage patterns of the tool. The consensus was that the system was most appropriate for medium to large projects or projects where the level of uncertainty was high. The real potential of</td>
</tr>
</tbody>
</table>
the system was perceived to be as an aid to pre-planning, to assist the project manager “get a better mental picture of the shape of the project” prior to creating full and detailed plans, possibly using existing traditional systems. For this reason the ability to export project plan data from the tool was considered a priority issue.

Another important issue which arose during this trial was the desire for specificity and quantitative attributes of an agents advice. In particular, the issue of more quantitative advice - which could offer exact percentages or absolute numbers - in relation to a given situation was considered to be very important by a small number of users in one of the organisations. The possibility of offering more quantitative advice was discussed with the authors of the P3 Handbook and Training Guide and was considered to be very difficult and often not appropriate in many circumstances. For example, while it may be appropriate (and not unusual) for a risk management expert (agent) to comment that a particular project (or scenario based on a given project) was 70% likely to fail for a given reason, it would be unusual for an expert to comment that a particular lifecycle was 70% appropriate for a given project. However, as a direct response to this request, the scope of the search for suitable material - for use as the basis for agents - was widened to include more empirical studies which could be used to produce more quantitative advice.

The initial comments of the users in relation to performance and speed were considered to be a reasonably important issue, but given time restrictions it was considered more appropriate to use the majority of remaining time in the development of new agents, with a small time allocation for performance issues. Comments regarding the construction of scenarios were considered and some alterations made to the presentation of this information in subsequent prototypes.

9.2.3 Trial 3

<p>| Trial  | Trial 3 using Burgundy prototype. |</p>
<table>
<thead>
<tr>
<th>User details</th>
<th>Eleven staff from two P3 partner organisations which included most of the reviewers from trial 2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>Trial conducted over a three week period.</td>
</tr>
</tbody>
</table>
| Objectives  | • One of the principal goals of this prototype was to include a larger set of agents, therefore the emphasis of this trial was on gathering user feedback with respect to the advice being offered by the agents.  
• Get additional user feedback in respect of the construction and usage of scenarios - having taken into account the changes made since the last prototype.  
• As with both previous trials, assessing users perception of the added value of the system was also an important issue.  
• A secondary objective was the testing of a comprehensive automated installation program. This was an important issue as the development of an automated installation program for a distributed CORBA based system is a challenging process. |
| Main finding of trial usage report | • This review confirmed the report from the previous two trials, that users generally considered the system provided a useful framework for supporting their decision making process.  
• There were a large number of comments made about the type and content of the advice being produced by agents. These included issues such as the same advice being produced more than once in a session, ambiguity in the wording of advice and the relevance of advice not always being obvious.  
• A number of users (mostly from one organisation who employ a rigorous process and quality programme) again expressed the desire for (some) advice to be expressed in more quantitative terms.  
• In addition, suggestions were made that specific corrective advice should be given. For example, "…as your project is running 10% late, increase staff overtime".  
• The general user opinion was that using the scenario-based method
to examine alternative paths through a project was valuable. However, there was a need expressed to have a mechanism to visualize the currently active paths / scenarios through a project. This arose as some users considered it was possible to “get lost” or disorientated when multiple paths existed.

Table 9.4 - Summary of Trial 3

The general comments in regard to advice (ambiguity, relevance, etc.) were dealt with by making minor changes in either the advice structure and format or trapping the execution mechanism to ensure that duplicate advice is either not produced or not passed to the User Interface. The revised advice presentation format (which including the ability to browse the advice history) was considered to by the previous trial participants to be useful and meet their expressed need. They pointed out that this allowed them to look back at the reasons/motivation behind decisions made and also to refer back to suggested best practices and advice when necessary.

Once again, the point of major concern of these user comments was the desire to have advice expressed in more quantitative terms. This request was again discussed at length with the authors of the P3 project Handbook and Training Guide in addition to a widened search for more empirical published studies. However, there was little by was of quantitative advice incorporated into the agents in this prototype as little (suitable) knowledge was elicited prior to the trial of this prototype.

There were a number of performance issues in respect of this version which were subsequently rectified. In particular, a change to use the “InProcess” method of server threads increased the general speed of the tool. However, the initial tool startup was still extremely slow, due in the most part to the delay in starting the ORB and launching the CORBA servers associated with the tool.

9.2.4 Trial 4
<table>
<thead>
<tr>
<th>Trial</th>
<th>Trial 4 using Tipperary prototype.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User details</td>
<td>Nine staff from two P3 partner organisations and included most of the reviewers from trials 2 and 3.</td>
</tr>
<tr>
<td>Duration</td>
<td>Trial conducted over a two week period.</td>
</tr>
</tbody>
</table>
| Objectives | • The main addition to this prototype was a larger and more comprehensive set of agents with a wider scope of expertise. Therefore, particular emphasis was placed on user reaction to the nature and type of advice being offered by the expanded agent library.  
• This prototype also included a limited number of help screens and a basic user manual, therefore user assessment of this material was also required.  
• As with previous trials, assessing user perception of the added value of the system as a decision support framework was also an important issue.  
• A secondary objective was user testing of the efficiency and reliability of the system as a whole. This information was particularly important from a commercialisation perspective. Additionally, the testing of an updated CD-ROM based install and uninstall utility was being monitored. |
| Main finding of trial usage report | • Again as with previous trials, users generally considered the system provided a good framework for supporting the decision making process and had commercial potential.  
• The users who had been involved in the previous three trials considered that the development prototypes to date had (in the most part) brought the tool in line with the expected functionality of a standard pre-commercial (beta or release candidate) system.  
• There were numerous suggestions made as to the possible usage patterns of the system, ranging from a project pre-planning tool to a project manager training tool.  
• There were a number of favourable comments made regarding users understanding of a project and its parameters and the quality |
of decisions subsequently made. Users commented that they “had a better feel for” and “understood potential danger areas” of a project.

- The comments received in respect of advice being produced by the agents were generally favourable and were due to the expanded amount of advice being produced as a direct result of an increase in the number of agents in the agent library.

- A number of specific comments were made about the type and content of the advice being produced by agents. Users appreciated the expanded amount of advice being produced by agents in this prototype version and also the reduction in duplicate advice.

- As with two previous trials, there were more suggestions made with regard to the provision of quantitative advice.

- Some participants expressed the desire to have a high level of customisability in terms of a process model, tokens, etc., as they found the predefined models a little restrictive.

- The improvements in the appearance of certain aspects of the GUI which were made in this prototype were well received by users, in particular the alteration of a number of icons on the main screen which were now considered more intuitive.

Table 9.5 - Summary of Trial 4

During the review meeting there was substantial discussion on the possible usage patterns of the tool. As had emerged from previous trials, users considered it most appropriate for medium to large projects and not for small-scale projects. It was considered that the potential customer would be interested in using a tool which would help them “get an understanding of what the project required”, or use the tool to “help with thinking aloud about different approaches to a project”. This pre-planning usage was considered to be a reasonably unique aspect of the tool which could be used to complement existing traditional planning and management tools.
## 9.2.5 Trial 5

<table>
<thead>
<tr>
<th>Trial</th>
<th>Trial 5 using pre-commercial beta prototype.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User details</td>
<td>5 users from 4 non-P3 organisations.</td>
</tr>
<tr>
<td>Duration</td>
<td>Trial conducted over a one week period.</td>
</tr>
</tbody>
</table>
| Objectives | • The main objective of this trial was to expose the system to users who were not connected to the P3 project or P3 project organisations, thus getting feedback from a different perspective and from users who had not seen the tool evolve over time.  
• As with previous (P3 project based) trials, assessing user perception of the added value of the system as a decision support framework was an important issue.  
• Also of particular interest was user reaction to the nature and type of advice being offered by the expanded agent library.  
• A secondary objective was testing user reaction to the final system in terms of its commercial readiness, particularly in relation to issues such as install program, GUI look and feel, ease of use, help files, user manual and related product attributes. |
| Main finding of trial usage report | • The users considered that the system provided a novel approach to the creation of project plans and had potential to assist project planners with decision making.  
• They considered that the system could help project planners in “respecting good planning rules” and “remembering all the small things” about a plan.  
• It was suggested that the system may be of use to senior project managers to get “a view of what a project might look like” and therefore be better placed to understand the resources it may need.  
• Further, it was considered that the system had potential to “close the distance” between senior and junior project managers, as it could be used by the two managers to “sketch a basic high-level plan”, thus leading to common agreement on a basic project plan.  
• Users felt it would be useful if the system provided a facility in |
which they could attach their own (free text) comment to certain stages of a project as a memory aid on a particular project aspect or decision made.

- On a related point, some users expressed the desire to be able to annotate advice (with their own additional comments) created by the system and have that stored along with the system generated advice.
- In terms of the advice presentation (advice window) some users commented that it would be useful to have the facility to save advice to disk or export it to a word processor. Also they thought it would be useful if the advice contained web like hyperlinks to the appropriate sections of the handbook and training guide or relevant web sites to assist with getting more information on certain topics.
- The users placed great emphasis on the system's data export and reporting facilities. In particular they expressed a wish to have a data export connection to more tools than just Microsoft Project.

<table>
<thead>
<tr>
<th>Table 9.6 - Summary of Trial 5</th>
</tr>
</thead>
</table>

This trial was of particular importance as it was the first time the system was tested by non-P3 project users. The five trial participants were from four medium to large-scale software organisations. Two of the users elected to use the supplied case study, two used a recent project and the last developed a fictitious project.

The users responded positively to the system and considered it provided a novel approach to project planning and associated decision making, by comparison to existing systems. Much of the general feedback was in relation to the potential marketing strengths of the system - it was suggested that it would complement existing traditional planning and management tools and/or that it could be used to create high-level project plans by senior project managers in a multi-project environment as an aid to assigning personnel to projects.
## 9.2.6 Trial 6

<table>
<thead>
<tr>
<th>Trial</th>
<th>Trial 6 using pre-commercial beta prototype.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User details</td>
<td>4 users from 4 non-P3 organisations who had participated in the earlier tool user survey. Only four of the original six surveyed were able to participate.</td>
</tr>
<tr>
<td>Duration</td>
<td>Trial conducted over a three week period.</td>
</tr>
</tbody>
</table>
| Objectives | • The main objective of this trial was to ‘close the loop’ between the survey of tool users conducted prior to system development and the actual system developed. This provided feedback from a different perspective and from users who had not seen the tool evolve over time but who were familiar with the initial objectives of the research.  
• Another objective was assessing if the prototype system fulfilled the expectations of the survey participants, based on their understanding of what the proposal system was going to provide.  
• In line with previous (P3 project based) trials, assessing user perception of the added value of the system as a decision support framework was an important issue.  
• A secondary objective was testing user reaction to the final system in terms of its commercial readiness, particularly in relation to issues such as install program, GUI look and feel, ease of use, help files, user manual and related product attributes. |
| Main finding of trial usage report | • In general the users considered the system met their expectations in terms of provision of advice on project planning and the construction of project plans. However, some had expected the system to be more orientated towards the subsequent management and tracking of a live project rather than just planning.  
• They considered that one of the potential benefits / uses of the system was in allowing a project planner “walk around” a project and get a “feel for” or understanding of “what the final plan could look like”. |
• A criticism was that the system did not have any explicit / dedicated services directed at the planning of the software maintenance stage of a product or legacy system. It was suggested that the lifecycle of a maintenance project differs from that of systems development.

• The users considered that the system could be useful in a wide range of projects and should have the potential to be tailored to different types of project. For example, they suggested that the agent library be expanded to include features for typical data processing applications, internet applications, embedded systems, etc. and provide a feature for the user to select the general classification of project they are working on and provide specific advice for that classification.

• Likewise the users suggested that the agent library should contain a series of agents which were specialists in different standards, such as CMM, ISO 15507, etc.. The user could then select the standard they wished to work with and receive advice on creating project plans using that standard.

• The users further suggested that the system should provide the ability to ‘turn off’ agents that a user ‘didn’t like’ or ‘didn’t agree with’.

• One of the potential strengths of the system which was identified was the ability to expand the agent library. It was suggested that of great potential benefit to an organisation would be the facility to create a set of company-specific agents (for internal standards, practices, etc.) and have these inserted into the agent library. This suggestion fitted closely with the intranet / network system deployment approach.

• It was suggested that the system could be used in a ‘training mode’ or as a training tool to assist with training new project planning / management staff, or as an aid to transfer of know-how within a company or department.
• Furthermore, they suggested that the system could be of potential use in an academic environment as a training tool which could be used to complement a project planning / management course.

Table 9.7 - Summary of Trial 6

This trial was important, because, as with trial five, the participants were also non-P3 project users. Furthermore, these users had participated in a survey of project planning / management tools and were aware of the initial objectives of this research. Of the original six survey participants, two had worked in P3 partner organisations at the time of the survey, but no longer worked for those organisations at the time of this trial. Furthermore, only four of the original six survey participants were able to be part of the trial process. Three of the users elected to used a recent project and re-create a project plan for it, while the final participant developed a fictitious project.

Overall the users response to the system was favorable and they made a large number of suggestions and recommendations. Of particular interest were their suggestions of several possible enhancements to the agent library and the functioning of the agents. Many of these are suggestions which should be incorporated into further releases of the tool.

One of the objectives of this trial was assessing if the prototype system fulfilled the expectations of the users based on their participation in the survey. Notwithstanding the suggestions noted above, the general impression of these users was that the system did provide the type of features they had expected. Further, they considered the system was commercially viable but probably not to small software organisations. Of particular importance from a commercial perspective was tool interoperability and data export facilities, which were considered to be of high level importance to potential customers. They also noted that the system should be marketed as a companion or complementary system to existing (traditional) project planning and management tools. In this respect they shared the views of the users in trial five that the system could be aimed towards the pre-planning or feasibility stage of a project.
9.3 Trial Usage Findings

The motivation for conducting the user trials was twofold. Firstly to test the tool in operation by project managers and secondly to assess user opinion of the added value of an intelligent assistant system. The trials were conducted in six distinct stages, one for each of the four major prototype releases plus two additional trials based on the pre-commercial prototype release. The initial four trials were conducted at an early enough stage during this research to influence the evolution of the subsequent prototypes.

For the first phase of trials a total of fifty person weeks effort over a six month period involving twenty two different participants was logged. These users represented project management staff from two of the P3 project partner organisations and represented a broad range of experience from novice to highly experienced.

The second phase of trials involved fifteen person weeks effort over a two month period involving nine different participants. These users represented project management and quality assurance staff from eight different organisations and represented a broad range of experience from relatively novice to highly experienced.

The main output of these trials was a set of review documents which detailed the comments and opinions of the users involved in each trial. To summarise, the combined findings of these reports were:

- **Decision support** - The general feeling of users was that the prototype system demonstrated that the notion of intelligent assistance for software project planning was feasible. In addition, they considered that the prototype implementation provided a suitable framework for supporting decision making and had the potential to be of use in a commercial setting.

- **Plan descriptions** - The general opinion of users was that the mechanisms of describing projects plans (via models and scenarios based on a model) was an appropriate and useful device to capture information about a project.
• **Scenarios** - Users considered the ability to create multiple scenarios to examine multiple views or a projects plan (with corresponding advice) to be very useful.

• **Advice** - Of paramount interest in these trials was user feedback in relation to advice produced by agents. The overall trend was that novice users considered the advice appropriate and useful as either a reminder of a particular aspect of planning or as an indicator of which direction to consider. However, more experienced users expressed the desire for more specific and quantitative advice.

• **Plan understanding** - There were many comments made such as “get a better mental picture of the shape of the project”, “get a better feel for a project”, “understand potential danger areas” and “remember all the small things about a plan”. These comments related to the project planner / managers understanding of a project and the parameters which influence the decisions made about it. A common theme in many user comments was that this aspect of understanding a project (either a specific project or general project planning) was increased.

• **Training tool** - A suggestion put forward by a number of users was the possibility of a repositioning of the system for use as a training tool in which users could develop a model of a fictitious project and thus practice project planning skills on a ‘virtual project’.

• **Deployment** - The prototype system was successfully deployed on a number of user machines via an automated setup program. Notwithstanding a number of small problems with ORB / JVM identification and access to the Windows NT registry, the prototype was successfully deployed by end users on a variety of machines.

• **Operation** - The prototype system was successfully operated by a number of users on a variety of machines. This was an indication that the prototype system was capable of being executed in a commercial environment, although the slow speed of execution in early prototypes was an important issue. However, users acknowledged that the speed issue was not of great importance for a research prototype, but would be for a commercial version.
- **User interface** - In general, users were satisfied with the GUI and its ability to handle data input. A large number of comments were made in the early stages and these were incorporated in subsequent prototypes.

One of the most difficult issue to tackle which arose during the user trials was the request for advice which was more quantitative in nature. This has proven difficult for two reasons; Firstly, little suitable source material was available which contained quantitative data / results that could be used as the basis for agents. Secondly, it is difficult for humans to discern the differences between quantitative values at a fine grain level with domains such as software project planning. For example, there is no appreciable difference between the values of 70% and 75% if they were expressed as a measure of suitability for a given lifecycle model. However, it is worth noting that this quantitative issue - while important in its own right - is not a central issue to the proposed architecture of this thesis. It is however an indicator of the nature of advice users perceive to be useful in addition to advice already produced.

Following from the series of users trials described in this chapter, the pre-commercial beta prototype system is currently being further enhanced - based on many of the comments made above - with a view to launch on the commercial tool market.

**9.4 Summary**

This chapter has presented a discussion on a series of user trials. For each trial the objectives were presented and the users comments discussed. In addition, this chapter also presented a brief discussion on the outcome of the trials.

Chapter 10 will present the conclusions of this research based on the proposed architecture, the construction of a prototype implementation and the series of user trials. This chapter will also propose directions for future work in all areas addressed in this research.