Managing Pilot Projects

Some Guidelines Derived from Experience

Pilot and prototype design are different from conventional projects. Yet project management courses and texts seldom deal directily with the issues involved in managing them. This brief document gives some insights which have been gained with such projects in a variety of engineering and information systems environment.

General Guidelines

1. Pilot or prototype design projects need to managed in ways which are very different from conventional projects. Pilot or prototype projects have as their primary objective the creation of a "first version" of something, either in the work place in general, or inside an organization which has never done such a piece of work before. As such, it is difficult to judge what their scope, size and work break down organization should be. In fact, this type of project is often under taken for the very purpose of acquiring the type of experience needed to set or estimate such traditional project management parameters.

2. The boundaries used to manage conventional projects all depend on prior experience. Construction, engineering and information technology projects have lots of past experience to which project planners and managers can refer. This past experience is the basis of the well defined project plans, robust resource estimates and traditional project monitoring techniques used to bound such projects.

3. Like conventional projects, prototype design projects need to have some external boundaries in order to be effective. Otherwise they tend to drag on, and not produce anything - even rejectable designs. But since there is little "product building experience" to go by, these boundaries must come from other sources.

4. Experience with prototype design projects in both engineering and information technology has shown thatseveral s8uccess factors are crucial in managing these projects effectively. They are:

    - calendar defined timing,
    - team leadership,
    - talented team members,
    - a staged approach / regular process evaluation,
    - slightly more than adequate resources for each stage.

    The guidelines derived from experience for each success factor are briefly given below.

5. Even when these guidelines are met, it is important that both team members and evaluation group members maintain a "prototype mind set" in their work. Prototype teams need be given a real chance to succeed. But they are not doing pure research work. Their objective is to produce a first working version of some thing. The experience acquired in doing so is valuable for future planning. Many times this experience is useful for showing "what not to do in future". So evaluation team members must be prepared to "stop" a prototype design project whenever it has not does not show concrete progress. Killing non-productive prototypes early is far better for overall morale, than letting them drag on non-productively. At the same time, a prototype team must never work in a way which leads to long term operational commitments, no matter how successful. That must remain part of the "roll out" or operational implementation of a working version of the product.

The Prototype Design Project Success Factors:

Calendar Defined Timing

1. Define the step in the project on the basis of the calendar, since the work break down structure cannot be based on history.

2. Set each work stage to last a maximum of a quarter (3 months).

   Teams which cannot show some concrete sign of progress on a prototype in 3 months will probably not do so in 6.

3. Insist that each work step conclude with some concrete deliverable, no matter how crude.

   Teams which cannot produce something tangible, even a comprehensible set of specifications or models of a product, in 3 months are not likely to do anything concrete in longer time periods.

Team Leadership

   (the 1st of the 2 key critical success factors)

1. Pick a team leader who has participated in successful prototype design projects before.

   The creative churn of a design team does not allowing learning "team leadership" as you go along. The work process leadership exhibited and managed by the team leader is often the only point of relative stability in the team's work.

2. Make sure that the team leader has demonstrated first class flexible collaborative work group skills in the past.

   Design teams lead by autocratic team leaders, no matter how soft their personal face to face style are not design teams. They are simply 'staff groups, whose job is to help articulate the design of one person - the so called team leader.

3. Pick a team leader who has demonstrated an ability to work with people who are both creative and more experienced in their areas of speciality than the team leader.

   Leading a design team members requires that the team leader can "forget" a personal area of expertise in favour of bringing insight into how the creative specialization of others can be blended or brought together in a prototype product or model.

Talented Team Members

1. Staff the project with individuals who have demonstrated "above average" talent and inter-personal effectiveness in their previous work.

- Innovative talent which can remain focused on the prototype product and not the others' personalities is extremely important.

- The team must translate their own and others' ideas into a more or less working model (a prototype) of an eventual product. This eventual product may be produced once (a "one off" product") or many times. In both cases, the future production team will have the experience of the "prototype type team" to guide them.

- This means that the talent of the design team will have be captured in the prototype, and through it be transferred to the eventual production or regular operations team. But no such talent transfer process exists for the prototype team. It is essential that this team be staffed with the "best talent" available at the time.

- Powerfully creative individualists who find it hard to work in teams may be a source of input and inspiration to a prototype design team. However, they do not tend to make good team members. They are better utilized as sources and "critical reviewers", than they are as team members.

2. Keep the prototype team small and tight.

- Human beings working in groups of more than 8 to 12 find it close to impossible to both manage their interactive working process, and focus on the content of their work at the same time. That is why large groups use defined rules of procedure, or project plans which can be well defined based on previous experience.

- Prototype groups need to work in ways which are extremely sensitive to the demands of what they are creating, and to the potential of each individual to contribute to this. They cannot work according to a "set procedure" or "pre-defined work plan" and handle the stops, starts, fall backs and leaps forward which will characterize their work.

A Staged Approach / Regular Process Review

1 Stage the project through a series of calendar defined work steps, each of which must deliver the best that can be done in the time allowed.

- This simply repeats the points made under "**Calendar Defined Timing"** above.

2. Conclude each stage with a clear "continue/stop" decision on the part of an evaluation group or board.

- The size of the team, and the calendar dates for progress review are the real ways in which the "burn" rate of dollars and people on a prototype project are controlled.

- Teams which cannot demonstrate concrete progress, either because of the nature of their composition, or because of the impossibility of the project, need to be stopped before the demoralization spreads outside the team. Another

team, or another approach may have a better chance, especially if it is mature enough to learn from the efforts of a "stopped" team.

- Human beings must continue to believe they can progress, even when it is clear they are not, in order to be effective at doing something new or innovative. A prototype team cannot be expected to "kill itself" until it has gone through a long period of demoralization. This "outside looking in" type of evaluation must be the responsibility a group which is distanced from the day to day work of the prototype team, which still being aware of all the issues involved in setting up the team in the first place. This is the review /evaluation group.

3   Pick evaluation group members who have a genuine stake in the prototype product's success.

- They will more interested in the critically evaluating the progress of the team than they will in keeping the team going for its own sake. They will take a risk on allowing a team another "work step" when there is promise, even if the results of the stage being currently evaluated are somewhat disappointing. They will be genuinely enthusiastic when the team is successful, allowing them to realistically praise the team, terminate the prototype project, and recommend its migration to the regular production or operation stage..

- Keep off individuals who will benefit from the team's failure, either politically or materially or in terms of their own personal reputation. Such individuals will not be realistic about what the team is accomplishing or not accomplishing. They will be realistic about their own needs, explicit or implicit. This will motivate them to work to kill the prototype prematurely, or implement it before it can realistically move into production or regular operation.

4.   Stop the "prototype" project when it is clear that:

   a)   this team is not making progress, and has no hope of making progress in the next work step,

      or

   b)   the prototype is at the stage where others outside the team want to start using the prototype product in ways which will require commitment to build a working version, with all of the implied operating resources needed to support such a version from year to year.

5.   Keep all prototype projects to less than a year, not matter what the size of the product.

- At the current rate of social and technological change, a average product life time is between 3 and 10 years. Developing a product prototype in a time period which is between 10 and 33 percent of its eventual life is just common sense.

6.   Insist that the deliverable at each stage remains a prototype, so that it can be surplanted when:

a) lack of progress on the prototype no longer justifies continuing the prototype design project,

or

b) the progress on the design prototype is such that it is time to stop the prototype, and make a commitment to regular production or operations.

• Human being have a normal tendency to try to ensure the continuation of their work. In organizations, they do so by building complex inter-dependences which make it difficult to "stop" things or projects. That may or may not be reasonable for "normal work" which is funded and given resources through annual budget cycles. But it has no place in prototype projects. Consequently, all prototype products should be "isolated" during the prototype stage. Any tendency to implicitly use prototypes designs for "regular production or operations" must be stopped by the evaluation team.

• Prototype designs test the "feasibility" of the design. They are not built with production or operating efficiency in mind. Once a prototype design proves the concept, these considerations can be added to the prototype design as part of a formal production design, or as a component of a regular operations implementation project.

Sightly more than adequate resources for each stage of the prototype.

(the 2nd of the 2 key critical success factors)

1. Provide the prototype team with enough resources to allow them to focus on with the difficulties of building a prototype, not on using their creative energy to get around or past normal constraints used to control regular production or operations.

    • This means

        - freeing up the team members' time so that they can concentrate on the difficulties of the design project,

        - freeing up the dollars they need as a "total budget" amount so that they can purchase what they think they want within that budget without having to provide additional rationale or explanation to individuals not involved in the prototype project,

        - ensuring that purchasing groups prioritize their requests, so that a team's lack of progress is not a function of "organizational lead time".

2. Control prototype project teams by their size, their calendar targets, and the evaluation of progress done by the review group, not by asking them to continually explain what they are up to as part of their resource expenditure activities.

    • Prototype design teams will make mistakes. Mistakes lead to learning and better designs. Mistakes cost resources. Asking such teams to continually justify their resource expenditures means they will tend to justify their mistakes, not reject them and move on to better ways of doing things.

- All investment in prototype projects is risk investment. It could lead to nothing. That is why the evaluation group is so crucial. Its job is to minimize investment loss by reviewing projects, and stopping non-productive efforts early in their cost cycle.