

TYPICAL MANAGEMENT SHORTFALLS IN NEW PRODUCT DEVELOPMENT (NPD) AND THEIR AVOIDANCE

(for mass and batch produced products)

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ABSTRACT

This paper briefly reviews one model of the total NPD process, viewed as a “strategic business process”. The model is based upon that used by the UK Time to Market Association, [1][2], and its member companies, and put forward as being, for many NPD situations, a “best practice” model. The most successful implementation of the model usually requires good “change management” within companies and also demands *particular attention* to the avoidance of some potential management shortfalls that are liable to occur. These have been noted to be prevalent for various ways of organizing NPD activity so that a consideration of them should be generally useful to all companies engaged in NPD. This paper reviews these typical management shortfalls. They have been observed from practical experience as well as from the case studies [2]. These typical shortfalls are:

- 1 The High Level Team (HLT, for overseeing the work) lacks cohesiveness and diligence.
- 2 Reviews are not effective, time wasting, and may even undermine the project.
- 3 The project team leader is not sufficiently qualified.
- 4 Manufacturing inputs are too little and too late.
- 5 The project planning is unrealistic.

Whether or not these shortfalls are *universally* the “most frequent” and the “most important”, is arguable. What is clear from practical experience and some case studies, is that they are certainly very frequent and very important – because their effects can be devastating to the NPD effort. We here discuss the “root causes”, and suggest ways to avoid and remedy them.

Keyword: New product development.

1. INTRODUCTION

Figures 1-3 show a model of the NPD process, as used by the UK Time to Market Association and its member companies. The model is simple and serves as a good reminder of a “best practice” way to conduct NPD.

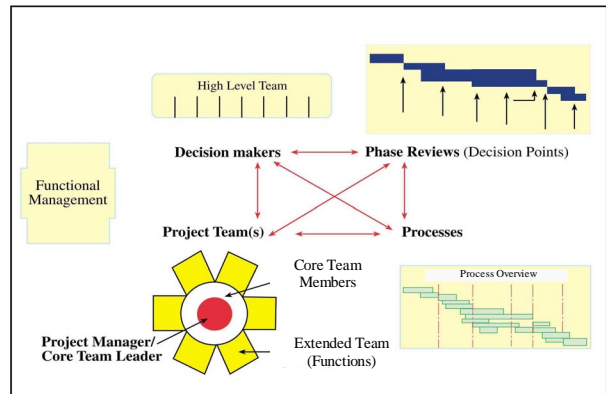


Fig 1 “Product Creation Model” (centerpiece of Fig 2)

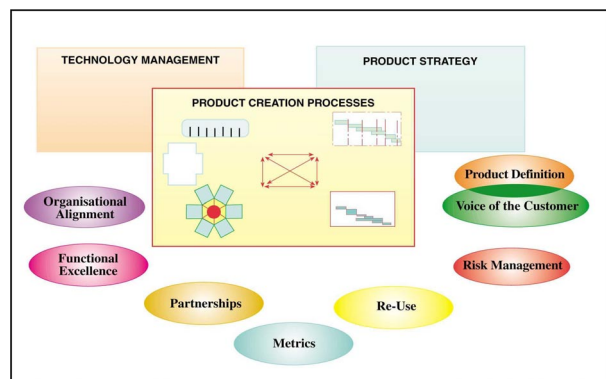


Fig 2 Overall NPD Model

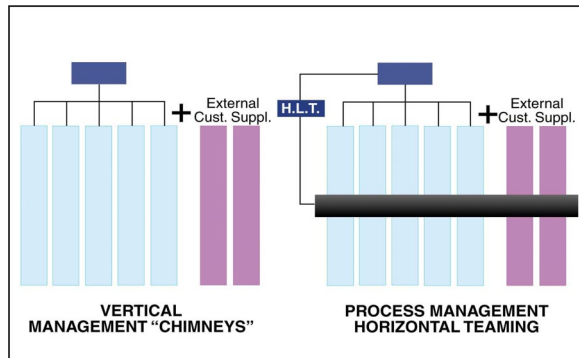


Fig 3 Cross-functional Teaming

Arguably, the above model does not always apply universally – there may be circumstance where different arrangements might be more appropriate as a “best practice”, [3][4]. Nevertheless, we suggest that the *basic principles* underlying the model are appropriate for the majority of NPD situations. The central part of the model, i.e. Fig 1 is based upon the following basic principles:

- Cross-functional project teaming, Fig 3, is more satisfactory than having the individual project staff working within the various functional boundaries, or “chimneys”. Where possible, Fig 1, it is best to have a relatively small “core team” dedicated to the project – rather than having these team members working on a number of projects in parallel. An “extended team” structure will usually be needed which is made up of staff working from within the various functions. They may be working full or part-time on the project.
- Because the project team will usually be absorbed by the day to day project work, they will mostly tend to be subjective rather than objective. They will not always see the overall picture, or know that there are changes of circumstances that require some re-direction of the project. Also, quite inevitably from time to time errors will occur. Thus a “High Level Team” (HLT), Figs 1 &2, is needed to help steer the project, oversee an effective review process as a major part of the TQM arrangements, and also counsel and assist the project team - particularly the project team leader.
- It is usually best to have a free-standing project team working under the guidance of a good HLT as shown in Fig 1, as compared with having the project supervised by one function like R&D, Business Management, or Engineering, where functional views and interest are likely to be too narrow, or too departmentally biased.

- The various processes need to be documented when it is clear that they are generally applicable to most NPD projects, and are appropriate for repeated use. This capturing of the best ways found for doing things saves time and effort by providing guidelines on how to proceed for both established and new staff.

The above principles for NPD are utilized by many companies world-wide so as to achieve good NPD success. Most of these companies have developed their NPD process by trial and error, as well as from learning, often via benchmarking studies, from other companies’ experiences. In developing and implementing such NPD processes, it is clear from [2] as well as from our own experience, that a number of managerial problems are somewhat quite likely to occur unless special care is taken by senior management to avoid them. These problems are liable to undermine the NPD process. These areas are:-

- 6 The High Level Team (HLT, for overseeing the work) lacks cohesiveness and diligence.
- 7 Reviews are not effective, time wasting, and may even undermine the project.
- 8 The project team leader is not sufficiently qualified.
- 9 Manufacturing inputs are too little and too late.
- 10 The project planning is unrealistic.

We will now consider each of these in turn, discuss the various root causes and indicate the ways and means for avoiding them.

2. HIGH LEVEL TEAM (HLT) LACKS COHESIVENESS AND DILIGENCE

The HLT members need to be chosen for their knowledge and abilities related to the project. Normally they will be senior people who have a very good understanding of the company’s business, products, competitors, and technology. Often some of the HLT members will be functional managers. Others may be senior professionals, or consultants from outside. Usually, some of them would have helped to make the case for the project and “champion” it. The HLT may also have approved and recommend the project for funding and helped to set up the project team. Thus the HLT ought to be overall very competent to carry out its tasks of assisting the project team generally, orchestrating the project reviews, steering and re-directing the project as needed from time to time. However, in practice we find that the

HLT may fall short of its duties because it, in the event, lacks cohesiveness and diligence. The typical root causes for this are outlined as follows.

The HLT members may see their HLT job as a “second lower priority job” – particularly if they are also busy functional managers. Therefore they may not give enough time and effort to their HLT work and start to lose touch with what is going on.

Because they are senior people, it is likely that some will tend to show “political behavior”. Those who were not the original project champions, but asked to serve on the HLT, may find themselves not fully in agreement with the project. They then may take an adversarial approach to their HLT colleagues and to the project team. This immediately shows up as the HLT lacking in cohesiveness – particularly if the HLT becomes polarized into groups being “for”, “against” and “neutral – still need convincing”. This creates understandable alarm amongst the project team because they see the HLT as being unclear in its support. This, plus the loss of being in touch with the progress of the project by some of the HLT members can, for example, result in demands being made by some HLT members to re-run arguments over and over again for and against the whole project or some specific aspects. This can result in project discussions degrading into destructive adversarial “point scoring” rather than being collaborative and helpful.

The HLT members therefore need to be counseled by the HLT leader or senior management as follows.

It is not allowable to regard membership of the HLT as a mere “second job”. The HLT duties are a major part of the TQM of the project. If there are conflicts of interest and time allocation, or conflicts of support and opposition to the project, these conflicts need to be addressed at the outset. If an HLT member has not fully “bought into” the basic ideas of the project he needs to review his reservations with his HLT colleagues and senior management. If he is unable to resolve his reservations and still feels uncommitted then it is probably best if he is taken out of the HLT. Sometimes it can be useful to have an HLT member who instills some caution into the project discussions on a dissenting “beg to differ basis”. However, this will only be useful if the dissenter is able to express his concerns in a helpful non-adversarial way. It should be explained that the HLT duties are best carried out in a collaborative rather than adversarial manner.

It should be stressed that the success or failure of the project is quite substantially in the hands of the HLT

members. To stress this and to provide good incentive, their annual performance appraisals, salary reviews and bonuses could usefully reflect their HLT performance, and the project’s degree of success.

To be effective, the HLT members are required to “do their homework” to make sure they are properly briefed, and to keep in well in touch with the project both formally and informally.

The use of “teaming tools” for the HLT as well as for the project team have been found useful. These can include “wet and windy” long weekend team exercises and the Belbin “Preferred Team Roles and Styles, [5]. The choice of the HLT leader is clearly important. He needs to be an excellent and well balanced facilitator, combining enthusiasm for the project with a high level of objectivity and realism.

3. INEFFECTIVE REVIEWS

Ineffective project reviews will lead to errors being undetected, any necessary changes in direction not being made, and the making of poor decisions. Such reviews are therefore mostly a waste of time and can undermine the project and everyone’s morale. These reviews are then regarded by the project team as an unpopular nuisance involving lots of extra work of preparation – rather than being a welcome supportive part of the overall NPD process.

The phase reviews and other reviews must be done properly. This is to ensure safe progress and to strongly support the project team. The project team members are unlikely to all be highly experienced. They may not have all worked together before and such teams are seldom ideally balanced in terms of their various abilities and teaming characteristics. Projects usually involve substantial technical, time, financial, and resource shortage challenges. The project team is therefore likely to be apprehensive and wanting to know that their work is sound. The reviews must therefore have high rigour and be definitely supportive. As the senior partner, it is one of the jobs of the HLT to set the right good tone for the reviews.

Some examples of a poor tone to be avoided are:

- Some members of the HLT, or other delegated review group, are not knowledgeable about the present position of the project. They then have to be reminded about the background and what is going on.
- The Chair of the review is either not effective as a facilitator, or is too dominant.

- The review agenda is set by the project team leader.
- The project core team – being apprehensive – do not declare the full story, omitting to state problems and anxieties. They rather seek to justify the present position and overstate the chances of trouble-free future progress and a final good outcome.
- The review group feel ill-informed and uneasy. They suspect they are being misled. Some of the review group members react by being adversarial. The project team is defensive and closes ranks.
- The review group stalls on approving the next steps, or perhaps approves them in hope rather than conviction.
- New key issues, errors and new risk items are not uncovered – and no remedial actions are put in place.

Clearly these types of reviews have little chance of improving the project outcomes. On the contrary, they will be damaging because they generate uncertainty, loss of credibility and general dissatisfaction: a waste of precious time and energy.

Examples of a good tone are the opposite of the above, and are worth elaborating on as follows:

- The members of the HLT, or other delegated review group, are well-informed because they have followed the project informally and have studied the pre-reading briefing notes given to them by the project team. The need for some remedial actions is already known and proposals for them previously circulated. Key issues and new risk items are therefore mostly already somewhat understood.
- The Chair of the review meeting is a skilled facilitator.
- The agenda has been agreed between the project team leader and the Chair of the review body. There is a clear reason for having a review, e.g. “a Phase review is needed to allow us to order the tooling – otherwise we risk spending a lot of money in error”; or: “a design review of a mother board PCB is needed before we make the prototype/pilot production run”; or: “a business case review is needed because our continual monitoring of the market and competition indicates some new threats or opportunities”.
- The project core team explains its view of the project progress – declaring the full story as they see it. Probing questions are put by the reviewers and constructive discussions result. The proposed remedial actions are agreed with some

modifications. Two or three additional risks or other issues, that were inadvertently previously overlooked, were identified and dealt with.

- The HLT, and the review body (if not the same people), and the project team feel the review was good and needed. All parties feel more confident, and feel that the real project status as well as risks are known.

These types of reviews much improve the chances of a good project result. There is very good pay-back on the time spent preparing and running the review. The actual preparation – which is part of the review process – is very valuable for the project team. It enables them to have a fresh and more objective look at the project status. The project team will feel well supported and appreciated. The HLT or other review body members feel they have made a good contribution to the project.

4. PROJECT TEAM LEADER NOT SUFFICIENTLY QUALIFIED

The job of the project team leader involves a blend of project planning and review, people management, technology and often “the politics”. The qualifications for team leadership should arguably include having previously worked in a key position as a member of a project team *on a successful project*. For large capital projects or for large NPD projects for aircraft, motor cars and the like, companies usually make careful choices of their project leaders or “Project Managers”. These companies are very aware that considerable expenditures are involved, that very much is at stake, that project failure would likely be disastrous to their businesses. The project managers are therefore usually well-seasoned professionals who have acquired project management capabilities from substantial experience and training. For project teams engaged in NPD projects smaller in scale than the above, our experience suggests that the job of project leader and its importance is underrated by many companies. This seems to be because the project expenditures are not usually major proportions of the companies’ total expenditures – at least not until later on when tooling has to be purchased and production lines put down. Thus there may be, before the project is started, a feeling of there being “less at stake”. In fact, though, the revenues expected from the NPD projects may well account for substantial proportions of the revenues being counted upon for the years ahead, and may even be comparable with the revenues expected by companies in the capital plant, aircraft or motor car businesses.

Giving the project leader job to someone not really sufficiently qualified – “to try them out for a bigger job later on” or as part of a fast track management progression scheme - is risky and often a mistake. Sometimes there is not a sufficiently well qualified person available for the job. In that case it can be appropriate to select someone with good potential who is well thought of in the company by his seniors, peers and juniors. No doubt, if time permits, some formal training in project leadership would reduce the risks. Certainly, the project leader would need mentoring. Although becoming more and more used, mentoring still appears to be under-utilized in industry. A good mentor would most likely be someone who has a very successful track record of leading NPD projects, but has now moved on to other things. To avoid conflicts of interest it is probably best in most cases if the mentor is not a member of the HLT. That is not a rule, though, and sometimes mentoring from a HLT member can also give good results.

The selection of a well qualified project leader may be inhibited by the level of the appointment as regarded by the company, or by concerns of the potential project leader about his next career move. In some companies, the project leader position is not regarded as being a substantial management job and does not therefore offer an attractive salary. Those companies need to re-appraise the position of project leader and elevate the level and salary accordingly. Another issue may be career development. Sadly, one still hears of cases of project leaders – as well as his/her team members – being made redundant at the end of a successful product launch. They had completed their task, but the company had no further plans in place for their career development. Obviously, companies need to try very hard to offer some job security to people working on NPD projects that are bound to last typically only 1-3 years.

5. MANUFACTURING INPUTS TOO LITTLE AND TOO LATE

It is still possible to find some manufacturing departments which take little ownership of, or interest in, the new product development work going on in their companies. They may feel already over-stretched in maintaining the quality, quantities and time schedules for today’s products. The arrival, “over the wall” style, of the manufacturing drawings and bills of materials for the new product may suddenly present them with aspects that they do not

welcome. They may see that the design could have been much less costly to produce if manufacturing had had one or two people assigned to the NPD team several months ago. They may see that some of the piece parts or tooling cannot be procured at the price, volume or lead-time required by the product plan. They may see that the product will be difficult to make and assembly within the necessary tolerances. Besides the above, some manufacturing staff may feel that the design, development and R&D people have more interesting and creative opportunities and less routine in their work. If manufacturing people are not much involved in the NPD process, they are always having to make someone else’s NPD creation. It is unfortunate but understandable in these cases that the staff involved in NPD and the manufacturing people are not always the best of friends, and that tensions result. Although occasionally these tensions may be “creative tensions”, it is clear that mostly the tensions are damaging – and prevent companies from reaching their full potential in NPD, even with the finest technologies and most skilled staff. Such problems can occur even in companies that otherwise are quite excellent, or even “word class”.

The ways to avoid these problems is really to *fully* implement “concurrent/simultaneous” engineering. That includes having one or two people from manufacturing, right from the start, as members of the NPD core project team and the HLT. Also, the manufacturing budgets, staffing and resource planning must include sufficient allowance for NPD participation.

6. UNREALISTIC PROJECT PLANNING

Senior managers sometimes have the dubious policy of not permitting any allowances in the overall NPD plans for remedial actions. The practice is then to base the whole planning on absolutely everything proceeding perfectly. This policy may be in order to present the NPD team with highly stretched targets – so as to ensure the teams’ highest diligence, hard work and extra hours of effort. When, inevitably, things do not go according to plan – because of errors or unforeseen circumstances, the result is disappointment, and blame may be assigned. The project can never have happy outcome, even if quite successful, because it overran on the development cost, was late to market and probably had higher manufacturing costs - all as compared with the unrealistic project plan. Whilst some degree of “stretch targeting” will help concentrate peoples’

efforts and up-rate their diligence, being too unrealistic is a poor practice which project team leaders need to be able to reject. Here, the guidance of the HLT or mentor could be invaluable. Certainly, project plans should not be accepted if there is no allowance for remedial work, recognition of the risks, or if the stated required manufacturing costs is obviously much less than the current best estimates. Persuasions like “well, we will not let the project proceed unless you accept those targets” may be hard for project teams to deal with – they are placed in a “no win” situation. Not accepting the targets may mean that their project may not go ahead, and possibly be “career threatening”; accepting the targets will mean inevitably falling short and attracting blame – also “career threatening”. Senior managers have to create a better environment to achieve the best NPD. One good and helpful practice to help resolve unrealistic targeting is to have 3 cases recognized in the overall product plan:

- best case – when everything proceeds *perfectly*.
- likely case – where some of the recognized risks give rise to the need for remedial work and more time and costs.
- worst case – where substantially more remedial work is needed than was realistically hoped.

Even if the latter case is a “No Go” case it is worth recognizing as a possibility. A careful consideration of it should be part of the risk analysis and risk management for the project. These need a structured approach. Possible risks from internal and external risks should be assessed in term of the realistic chance of them happening and the impacts if they do. Reducing the chances for some risks can be achieved by diligence and rigour. Reducing the impacts is achieved by contingency planning for remedial action and back-ups. Putting these in place will add to the development costs and should be allowed for in the plan. Those costs can be traded off against the likely reduction in the NPD payback financials due to the risks.

7. CONCLUSION

From the above discussion it can be seen that the potential management shortfalls which have been outlined should not be particularly difficult to avoid provided they are recognized by senior management who have the will to implement the avoidance or remedial actions. Sometimes, the shortfalls can be interpreted as “lack of leadership and buy-in from the

top”. It is our experience that change-management, e.g. as often needed to implement concurrent/simultaneous engineering and improved NPD process, is only maximally successful when it has the full interest, endorsement, and active support of the senior management. In other cases, the shortfalls come about simply because senior managers do not agree or recognize, as “critical success factors”, the need for HLT cohesiveness, excellent review process, well qualified project leadership, concurrent/simultaneous engineering, and realistic project planning. We hope that this paper is helpful to management and staff in companies who want to improve or start up NPD.

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