Planning the "unplannable" – the innovation management paradox

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Abstract

R&D is often regarded as a fundamentally creative process that is best left to its own devices. This attitude, borrowed perhaps from popular cults surrounding modern-day celebrity technology entrepreneurs, can be found equally in start-ups trying to conquer a place in the competitive business landscape as well as in established multinational corporations serving steady markets. Empirical evidence based on personal experience seems to suggest this laissez-faire attitude is at the root of many innovation projects' failure mechanisms. Failing to properly plan for innovations often leads to failed innovations or even project cancelations. Main issues with innovation project planning and control I found to be tied to lack of a) technical expertise, and b) understanding of product development business processes and quality requirements, both of which result in insufficiently detailed and specified work breakdowns and correspondingly unrealistic schedules. Tackling these issues in a step-by-step approach often proves more helpful than solely focusing on expedited execution, relying on frenzied rescheduling efforts.

Keywords: Innovation Management; Work Breakdown; Backlog; Planning; Scheduling; Research Management; Reasons for Failure; How to Plan R&D.

1 Introduction

The value of a systematic project-based approach to achieve specific objectives is generally accepted in most fields, but somehow when it comes to innovation there still is a widespread, persistent belief that those contributing to the effort are somehow best left to their own devices and not be bothered too much with processes or rules (as alluded to in Trott, 2021). Innovation, then, is viewed as a creative, organic, and therefore inherently chaotic process. I would argue the opposite, though: precisely because innovation tends to venture into the unknown, the risk of getting lost is ever present, even more so than with other, more predictable types of undertakings, and therefore planning and control are even more critical to success (Kirsner, 2017).

The myth about innovation's elusiveness is echoed in corporate attitudes towards R&D projects that have derailed when the cavalry called in is briefed that basically all is well and required ingredients are supposedly present, it's just some "day-to-day guidance" and "project management savvy" that would be missing. The key issue with failing R&D projects, though, I seldom found to be a lack of project management expertise—how to set up a work breakdown or project backlog, putting together Gantt charts, organizing regular demonstrations or retrospectives to keep contributors and stakeholders involved—which is after all easily fixed, but rather a lack of a) rigorous technical expertise and experience, and b) thorough understanding of the relevant

business processes and quality requirements, both of which are much harder to address (Shenhar and Dvir, 2007).

Faced with these issues and their consequences—delays, budget overruns—attempting to somehow, anyhow, regain control of the project and salvage business goals, senior-level leadership tends to become fixated almost to a point of obsession with scheduling—milestones and deadlines—increasing sense of urgency and pressure (which by then usually already is widespread), often making things even worse. Subsequently, project leads deemed responsible for the debacle are replaced, often by crisis-managers with narrow focus on execution and expedition who eventually fail to bring about desired results as well as execution and expedition are downright impossible so long as it remains unclear precisely a) what to do, and b) how to do it. Ultimately perceived as unfeasible, the project is then (rightfully) killed, albeit for the wrong reasons, whereafter potentially wrong conclusions are drawn for the business (see also Kirsner, 2017).

2 Technical expertise: the What

Any project-based approach, by definition, should start with establishing a work breakdown: a thorough assessment (*and* explicit listing) of what needs to happen across all involved disciplines to achieve project goals. Most of the struggling projects I encountered had in common that they lacked an explicit and sufficiently detailed work breakdown, either in the form of a waterfall-type WBS (work breakdown structure) or Agile user story backlog. Instead, there was only a vague notion of what needed to be done, often copied from generic quality manuals highlighting typical deliverables at each of the project stage gates, along with the assumption that good professionals would somehow figure out what was expected of them along the way. Standardized work breakdowns and deliverables might work (reasonably) well for projects that resemble past ones, but as soon as you set out to achieve something truly novel and more disruptive, you had better avoid cheating and carefully prepare the homework yourself.

Note that this by no means implies all activities—work packages or features—should be worked out to excruciating detail right at the onset of the project, nor that they be fixed in stone (an excuse often (mis)used for not having any work breakdown at all); it just means that proceeding through trial-and-error, feeling your way along, should be avoided if one is to have a sense upfront of what one is getting into and appreciate the challenges ahead as well as the budget, time, skills, and people and other resources needed to successfully tackle these.

Needed technical expertise to figure out the What is not limited to the discipline of product engineering, which, typically finding itself at the forefront of any innovation project, is often (unjustly) pointed out as the main problem; it includes all contributing disciplines. Product marketing, for example (see McGrath, 2000), is equally essential to project planning and success, and often equally problematic. Preparing or executing innovation projects without clear vision or roadmap, without sound sense of evolving market needs, often leads to unnecessary drifts in product and business requirements during the successive project stages, resulting in constantly moving targets which are then unsurprisingly missed at virtually every milestone gate review. Similarly, supply chain, procurement, manufacturing, sales, after-sales service are all equally important to achieving identified objectives and should be considered when preparing the work breakdown.

Increased technological complexity as well as stricter product safety and effectiveness demands have pushed up project size and costs, requiring ever more specialists, material resources, documented evidence of regulatory compliance, etc., making planning even more complex and critical to success (Trott, 2021). Setting up a practical work breakdown is harder than ever, requiring

in-depth understanding of each of the many specialisms involved as well as a comprehensive overview on their interaction and mutual interdependencies, which, I believe, is the main reason so many organizations today are struggling with managing innovations.

3   Operational expertise: the How

Next to missing technical expertise, lack of an actionable work breakdown can also be linked to operational inexperience. Frequently, teams struggling with planning are in fact struggling with formally imposed product development processes—project governance, applicable stages and milestone gates, needed deliverables, documentation and formats, roles and responsibilities, etc. Sometimes these teams are altogether unfamiliar with the way of working, for example in start-ups or newly established departments, or after company takeovers and mergers. But I have also encountered this issue in established companies that had been developing and marketing their products for decades, where quality guidelines were not followed because they were either outdated or so general and vague that it rendered them next to useless.

On other occasions, however, sensible processes are deliberately (be it quietly) bypassed trying to speed up development and improve time to market, usually as a result rather slowing it down and further delaying (or even outright ruining chances of) market release. Formal processes are then perceived as dilatory administrative overhead; creativity should be able to freely flow, is the argument often heard, unhindered by present-day's obsession with control and tendency to micro-manage. Notwithstanding any product of creativity, say a piece of art like a novel or a painting, involves at least some level of planning for it to materialize, rendering the argument against planning invalid, present-day business of innovation, with its ever-critical shareholders and investors, simply no longer allows for ad-hoc adventures with uncertain and untimed outlook on returns.

The argument against planning typically (though not exclusively) surfaces when innovation is supposed to be truly disruptive and involves major departures from the state of the art: R&D projects where the "R" is significant and critical. Yet even research undertakings—where the outcome itself may be uncertain but the steps towards the outcome, after all, aren't—can and should be planned.

An elegant way in which organizations go about research-heavy innovations is by upfront identifying all business and technological uncertainties involved, the parts of the endeavor requiring further investigation, and pulling these in into pre-development or feasibility stages. Ideally, then, at the onset of the true development phase, all (or at least the biggest) unknowns and uncertainties have been eliminated and chances for the innovation to eventually make it to market greatly improved.

Though most companies these days have such staged development processes in place, they still are prone to falling into the trap of advancing feasibility studies to development too quickly, sometimes even skipping the first altogether. I've seen this happening under pressure to keep up with competition, or with entrepreneurs trying to secure funding for endeavors that were more uncertain or would realistically take more time to complete than investors or executive decision makers were thought to be comfortable with.

Sometimes, too, it's just a lack of realism (or, more positively, over-optimism) that's at the root of the impatience. Whatever the reason, pushing uncertainties down the line usually results in even bigger delays and added costs as assumptions proved wrong at a late stage in the R&D process typically require consequential product and business changes implying extensive and lengthy rework.

At the same time, on the note of shortening time to market, following a staged approach to avoid wasted effort and budget doesn't mean *all* implementation should wait for pre-development phases to be completed. Those parts of the project that can be decoupled from the uncertainties under investigation could be implemented concurrently. Different parts of the project (swim lanes or features) may even follow their own asynchronized, decoupled development stages. Also, one could adopt a risk-based approach whereby the risk of wasted budget and resources is weighed against the potential business gains of earlier market entry, thus deliberately pushing ahead with development activities that might later on prove redundant. Pure, rigid waterfall methods (by which any phase should be entirely completed before starting the next) therefore hardly still qualify for innovations targeting today's fast-changing market needs (or whims). Time to market is of paramount importance; Agile has become the new standard—thought it too is a systematic method calling for planning and control, resisting chaos (see for example Cohn, 2005).

4   Forecasting expertise: the When

Only after the What and the How have been secured can the crisis manager come in and focus the teams on the When—and no sooner than that. All too often I have witnessed entire projects, steering committees and senior leadership included, pre-occupied with scheduling, coming up with timelines one after the other, promising delivery dates and deadlines almost to the day, with little more than a couple of bullet points backing these, without sound (sometimes without any) grasp of a work breakdown or of the process and procedures followed.

Scheduling is hard; it takes a lot of skill and experience (ideally within the organization and with the teams carrying out the work) to get it right. It takes effort and time (of the entire team) to assess workloads and lead-times, figuring out the optimal order and assignment of work packages, etc. Schedules therefore remain estimates at best, their added value being in the operational control and confidence they inspire rather than in their predictive powers.

Summarizing, as a practical guide, when confronted with underperforming innovation projects that somehow keep delaying, keep missing deadlines and milestones, and that supposedly just need a tighter schedule and stricter discipline to get back on track, my advice would be:

1. Put existing schedules, timelines, and deadlines aside and focus on the underlying basis instead.
2. Make sure all required steps and deliverables needed for achieving project goals are made explicit and broken down into sufficient detail. Use the entire team for this.
3. Identify all skills and experience (not only engineering) needed to carry out these steps and check if you have those available in the team.
4. Identify all (technical and business) uncertainties and plan investigations upfront in one or more pre-development phases.
5. Resist any temptation to move research to development too soon, even if it means postponing some of the major development activities.
6. While in pre-development for some parts of the project, (depending on the capacity available) development of clarified and decoupled parts can proceed and run in parallel, thus speeding up time to market.
7. Make sure your development process is clear and practicable to all project members. Don't assume everyone knows it; make sure, for example by kicking off the project with refreshment courses and instructions.
8. Once above steps are secured, lay out the work packages or user stories in time to arrive at a schedule. Again, involve the entire team. Monitor your development speed during execution to improve workload and lead-time estimates. And remember, schedules are never met; they

remain rough estimates at best.

9. Finally, managing the project is not something the project manager does, it is something the entire team does, and this is especially true for projects as complex and specialized as innovation projects usually are.

5 Conclusion

Drawing from practical experience with numerous industrial innovation projects both at large established multinational corporations as well as small-scale start-ups, I found that issues with underperforming R&D projects despite assurances to the contrary often stem from lack of technical expertise and operational inexperience with product development business processes and quality requirements rather than from lack of formal project management training or know-how. Crisis management and project recovery should therefore focus on these underlying structural problems first and foremost rather than solely on strained expedition of inadequate and incomplete plans (often just trial-and-error efforts disguised as plan) adhering to unrealistic schedules. A proposed step-by-step guide could be used to arrive at a more thorough project plan, considerably increasing chances of project completion and ultimately market release.

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Biographies

Colin Ashruf. Dr. Colin Ashruf has been an independent consultant for the high-tech and medical devices industry for over twenty years. He has worked for notable multinational corporations as well as small-scale start-ups. He regularly writes about the business of innovation for international media and holds a PhD and MSc from Delft University of Technology.