Managing innovation as Projects

Smart Practices

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ABSTRACT

When you are entrusted to develop a solution for an unmet Need, all you know is the Need, and not the Solution when you start such a project. You don't have any "specifications" for the product or the solution that you have to come up with as project outcome. Such projects call for a very high degree of innovation. And innovation, along with it, brings big uncertainties. This, in turn, poses greater challenges in fitting innovation in a project framework, with "triple constraints" of Schedule, Cost and Quality. Also, whether the solution chosen, is the "right" solution from a business perspective, and would make a success in the market ?

Such projects, therefore, call for project manager to think little beyond the standard contours of project management. It calls for integrating some smart practices in the overall project management approach. Some of them are - a very rigorous Need validation, greater research both primary and secondary, creating

an environment conducive for innovation, encouraging ideas, more frequent touch-points with potential users, assessing potential areas of expertise required early-on and connecting with the potential sources, multi-prong approach for risk areas, and so on.

I have been managing such innovation driven projects in the field of medical devices for a Start-up for last few years (out of my total 24 years of experience, 20 years being with L&T and GE kind of companies) and would like to put across these practices along with case studies in my paper.

INTRODUCTION

The projects which involve a high degree of innovation, tend to start with loosely defined, sometimes even ambiguous objectives that become clearer as the project progresses. The processes used are more experimental and exploratory, and may not follow linear guidelines strictly.

Such projects, therefore, call for project manager to think beyond the standard contours of project management, and integrating some smart practices in the overall project management approach, for a successful outcome of the project.

Here, to some extent, I am stretching the criteria for project's success; The outcome shouldn't only meet the "given inputs" and pass on the triple constraints of schedule, cost and "quality", but should be a business success. It should meet the objectives not only in letter, but also in spirit.

Some of these Practices are -

- Need validation to ensure that the project is targeting the right "Need" – Many a times, projects are initiated based on "gut feeling" or "hunch" not backed up by sufficient data,
- More frequent touch-points with potential users,
- Proactively assessing potential areas of expertise required and connecting with the potential sources and thereby effectively creating a diverse team,
- Being wary of Intellectual Property (IP) aspect all the time that the solution doesn't infringe anyone's IP as well as new IP if generated is protected in a timely manner,
- Having multi-prong approach for risk areas as the solutions are not tried & tested ones, and might not work.

The following section will elaborate these practices along with the examples and case studies, and how they led to successful project outcomes. This paper would use examples and case studies from medical device domain.

DETAILS OF THE PAPER

1.0 Smart Practices

Is Tata Nano a successful project? Yes/No !!

What do you think went wrong? Some say Product bad, some say Marketing.

Was the right Need captured? Or was the right Product solution provided?

Was the product conceived based on market research or by "hunch" of someone "very senior"? Was the Need found or Validated in a scientific manner?

This example brings us to our first point viz. Need validation.

1.1 Need Validation

How ideas typically originate...

- *An engineer with a needle-phobic mother, decides to design an alternate method for administering the daily insulin she takes to control her diabetes.*

- *A spinal surgeon, frustrated with the limitations of the implants he uses to treat vertebral compression fractures, starts working on improvements to the device.*
- *A business student, observing a birth at a hospital in Africa is struck by the need for a technology to prevent blood spray during the process to protect healthcare workers when the mother is infected with HIV.*

Was there sufficient ground to start development?

Scrub the Idea thoroughly...

- How did the "idea" originate? Was there any "Observation" in the clinical environment ?
- How frequently the event / negative outcome occurred?
- How serious the negative outcome is?
- Therefore, is it a valid "Need"?

First key step, therefore, is to identify the "right Need" and **Validate the Need.**

Here is what we have come up to doing it in medical device space; following a bio-design process. It can be applied to any field. The framework is as under –

Figure 1: Bio-design process framework

Let me explain the whole process using a case study -

<u>Case Study</u> – "VAPCare", **A device for secretion management in intubated patients on ventilator in ICU to prevent Ventillator-Associated-Pneumonia or VAP.**

First step to do is to be with the potential User to understand the real Need. This is done by doing a **structured clinical immersion process**.

For VAPCare, figure 2 below depicts the exercise done. It was a Need which came out of the immersion process and the same was further validated.

Figure 2: Clinical immersion for need finding and/or validation

Final need validation from Key Opinion Leaders (KOLs)

Attended the GAMET conference on emergency medicine held at Global Health City, Chennai, to get VOC inputs and validate needs with Emergency Medicine doctors from across the country.

The need was also validated with other emergency physicians and intensivists in Bangalore, Hyderabad and Mumbai.

Fig 29 : Validation with Key opinion leaders (KOL)

Figure 3: Need Validation from KOLs

Selected Need

There exists a Need for an effective prevention of the incidence of Ventilator Associated Pneumonia in intubated patients in ICU to ensure long-term ventilatory support.

Figure 4: Selected Need

Need after Secondary Research (With data like number of incidences, ..)

Over **7,00,000** people a year develop ventilator associated pneumonia (VAP) during ICU stay. **40%** of these people **do not survive**.

Figure 5: Selected Need after secondary research data applied

And we start thinking about the Solution Concept.

Figure 6: Outline of solution concept

After Need validation, while we start working on concept and then the development, we do not forget our Users. That brings us to our second smart practice viz. more frequent touch points with Users…

1.2 More frequent touch-points with Users

In an innovation project, it's very important to have much more frequent and wider level of contacts with User community during all stages of development. This ensures that the product continuously meets the requirement of a broader user community.

For VAPCare we remained connected with multiple clinicians globally, kept showing them our different level of proto-types, taking feedback and analysing and acting on those feedback. This helps you ensure that our product is relevant and make course correction early in the game, which is less costlier.

For VAPCare, figure 7 and 8 below depict the extensive exercise done through-out the project. Results indicate **that over 90% potential users gave a thumbs-up to the product concept and design.**

4 countries

17 cities

26 hospitals

Over 50 Clinicians

Figure 7: Potential users & opinion leaders consulted through out the project

Over 90% Clinicians gave thumbs-up to the concept and the design

Figure 8: Findings from user touch points

1.3 Diverse pool of resources

Developing an innovative solution might call for expertise in un-common areas which a regular team might not have. For example, contamination free fluid dynamics, or an algorithm development using independent component analysis, a shielding technique, or a balloon development for air pressure stabilization.

Team must sense such requirements early and connect with such resources. Reach out to research centres, academic institutions like IITs and IISc, experts from your network, past connections and make sure that such expertise is available at right time.

For Vapcare, we leveraged all the potential resources we could garner. For example, uses of pinch valve for contamination free fluid control idea came from an old colleague whom I connected to for finding a solution.

Similarly, for our another project which involved development of first transport CPAP machine, we leveraged expertise at IIT-Ropar to develop a custom balloon for pressure stabilisation.

1.4 Being wary of Intellectual Property (IP) aspect

Innovation projects involve use of new ideas generated within the team, and there is a higher amount of IP which gets generated. Projects need to check that one, they are not infringing on anyone else's IP, as well as, new IP generated is protected by filing patents in all relevant geographies.

Therefore, thorough patent search must be conducted for any incremental innovation during the project and accordingly actions must be taken.

For Vapcare, this aspect was also taken care of well. After ensuring that the invention doesn't infringe on anyone's IP, Patents were filed in multiple countries including USA and Europe besides India.

VAPCare has already received a patent from USA, while other countries' applications are under processing.

1.5 Multi-prong approach for risk areas

In an innovation project, since chances for failure are high, a multi-prong approach for riskier areas is a must. Have multiple paths running simultaneously till one leads to maturity. Also, for such areas, look for similar areas to figure out a solution.

For example, in our innovation project for foetal heart monitoring using foetal ECG, it was a challenge to develop a signal acquisition circuit which is immune to noise and can pick-up clean signal when the input signal is of the order of 15 micro-volts. Therefore, we took two prong approach – while we develop it in-house, we also looked for semi-ready solutions around the world. We found a solution used in similar weak signal applications like EEG acquisition. It was an open source solution so IP issues didn't obstruct usage of the same.

2.0 Benefits accrued

By following the above practices in innovation projects, following benefits were accrued to the organisation –

- The products developed continued to remain relevant and gain User's thumbs-up for addressing their unmet need and being user-friendly.

- Despite being innovation projects with high uncertainties, projects stayed on track schedule and cost-wise too (there was a marginal extension but not significant like most such projects)
- Organisation has a US patent for the innovation, and the invention is protected in other relevant geographies by patent filing.

Figure 9: Final solution with Patent granted in US.

CONCLUSION

As we saw, adopting the above mentioned smart practices in management of innovation projects will ensure that the project outcome is what actually meets the actual unmet requirement of the customers. Besides, it will also aid in ensuring that such projects, despite their high inherent risks, do not excessively slip on schedule and cost, and become a business success.

REFERENCES

(1) VAPCare project citations courtesy M/s. Coeo Labs Pvt Ltd., Bangalore through Nitesh Jangir, Co-founder,

Aanand Tower, Rajaram Mohan Roy road, Sampangirama nagar, Bangalore 560025. Contact: 080-40923864.
www.coeo.in

Note: The final presentation would contain more graphics and contents, which could not be produced here due to file size limitation.