

- ▶ Handle trade-offs when unexpected events occur.
- ▶ Manage the flow of information and avoiding unnecessary iterations.
- ▶ Install control processes such as the Phase Gate that allow clear management, and facilitate the transfer of learning from one project to another.
- ▶ Avoid queues and delays when managing a number of projects simultaneously.
- ▶ Develop a competence in managing collaborations with others.

Recommended Reading

- (1) Wheelwright, S. C. and Clarke, K. B., *Revolutionizing Product Development* (New York: The Free Press, 1992). Authoritative and readable introduction to the subject.
- (2) Cooper, R. G., 'Third-Generation New Product Processes', *Journal of Product Innovation Management*, vol. 11, no. 1, January (1994) pp. 3–14. Summary of the stage-gate process pioneered by Cooper and his co-workers.
- (3) Cooper, R. G., 'From Experience. The Invisible Success Factors in Product Innovation', *Journal of Product Innovation Management*, vol. 16 (1999) pp. 115–33. Excellent and practical survey of do's and don'ts in managing innovation projects.
- (4) Keizer, J. A., Halman, J. I. M. and Song, M. 'From Experience: Applying the Risk Diagnosing Methodology', *Journal of Product Innovation Management*, vol. 19 (2002) pp. 213–232. Detailed description of a successful process for identifying and managing risks in innovation projects.

Main Case Study Wipro Technologies, India – optimizing NPD

Before reading this case, consider the following generic innovation management issues:

- ▶ What are the issues when new product development is conducted at multiple sites? How can these issues be addressed?
- ▶ How can the product development process be optimized through learning from each project?
- ▶ What should companies do to stimulate learning that is not just related to specific new product development projects?

Wipro Technologies is a world leader in IT services with global revenues of \$1.2 billion. Moreover, it is the world's largest provider of R&D services, with annual revenues of over US\$270 million and employing nearly 8,000 engineers in this domain. Founded over 20 years ago, it has eight development centres, including a major facility in Bangalore, India. It provides offshore product engineering for a wide range of companies in both the electronics and service sectors. The industries where it is active include

Main Case Study continued

automotive electronics, medical devices, telecommunications, computing (hardware and software), consumer electronics and industrial automation. The company has an approach that it calls 'Extended Engineering', whereby clients can outsource any part of the value chain, including complete product development, product sustenance and support. The demand for cost-effective product development is high, as companies attempt to design products with faster time-to-market and lower costs.

The Problem

The downturn in the world economy has limited the amount of money that companies can invest in their portfolio of innovation projects, and heightened the interest in offshore engineering. Advances in information technology have made it easier to co-ordinate outsourced activities and the number of companies taking this approach has increased significantly. Sachin Mulay, Strategic Marketing Manager for the Embedded and Product Engineering Group, says there are a number of factors driving companies towards offshore engineering. 'Initially, it was the cost advantage that caught people's attention. That is still important, but now there is recognition that offshore engineering can also improve speed to market, and the quality of the finished product can also benefit'.

Cost, Quality, Time – Extended Engineering

It has long been recognized that co-location makes NPD teamwork easier. However, as an offshore R&D service provider, Wipro always has to deal effectively with multiple-site work and a global delivery model. A. Vasudevan is the Vice President of VLSI & System Design and manages over 600 engineers working on clients' projects. He has clear views on the challenges in new product development and says, 'We must excel at running multiple-site projects. To achieve this, we put a lot of emphasis on defining roles and responsibilities at the beginning of projects. We also have a 'handshake' concept, where we put milestones into the schedule where we deliberately check that both parties are 100 per cent satisfied with both progress and communications.' Wipro engineers are not only technical experts but also they are highly trained in project management. 'As part of our "Talent Transformation" programme, engineers receive intensive coaching in cross-cultural issues, project management techniques, optimizing communications, and negotiation', says Vasudevan.

A recent Wipro project was to develop a human-machine interface for IxFin Magnetti Marelli. This company is the second largest European automotive supplier of what are called 'instrument cluster' products – the instruments and related electronics located around the dashboard, including the entertainment system, air conditioning and the like. IxFin Magnetti Marelli were looking to position themselves as the technology leader in their market,

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offering automotive manufacturers a fully integrated 'infotainment system': an in-car multimedia system with GPS navigation, telephone connections, links to service centres for breakdown and emergency calls, and voice recognition controls for functions such as air conditioning. One challenge was that IxFin Magnetti Marelli had no previous experience of offshore projects. However, extensive communications allowed the transfer of key knowledge to the Wipro team and the timely delivery of a system that was needed for the launch of a new model from Fiat. In fact, in one year of the project only two person months out of 105 person months of engineering effort were 'on-shore'.

Wipro's expertise was initially seen by clients to be purely technical. That meant that clients' projects were run largely following their own NPD processes. 'Increasingly, however, clients are recognizing our process expertise and are interested in us helping them speed-up their own processes. We conduct over 500 projects per year and so Wipro has a greater opportunity to learn about the strengths and weaknesses of the product development process than companies working only on their own limited number of projects', says Vasudevan. 'After every project we analyse what the technical and managerial lessons are, and in the VLSI/Design space we have defined our design methodology called "EagleWisdom" ' (the name alluding to the clarity of an eagle's vision). Effective reuse and automation are the basic tenets of this design methodology.

Service Sector

Although Wipro is very active in electronics and manufacturing, it also has a rich history of working in the service sector, particularly financial services. These clients are served by a specific organization that has gained significant expertise in the different field of supporting new service development.

Prudential is a leading life and pensions supplier in the United Kingdom, with a customer base of around 7 million. The company had numerous call centres spread across diverse locations in UK, with each call centre dedicated to handle customer enquiries related to a single product line. This meant that customers had separate numbers for each of their products, and the call-centre consultant had to sometimes transfer them to a different department for each product. As a strategic IT partner, Wipro rationalized Prudential's product categories and business processes, and provided an integrated view of transactions across products. The most important initiative was the integration of multiple front-end customer services applications into a single consolidated system. This will give Prudential's customer service agents a consolidated view of the customer allowing them to deal with a significantly larger number of transactions. Prudential will be able to deliver on the brand promise of 'one operation', reducing costs and delivering even better customer service.

Main Case Study continued**The Innovation Council and the Future**

One of the potential dangers of R&D service consultancy work is that all of the innovation at Wipro could be solely in response to clients' specific requirements. Management recognized that innovation should not only be project-driven, and three years ago formed the 'Innovation Council'. 'We recognized that we consistently need to push forward our own expertise. Through our own knowledge of a wide range of technologies, we saw that we could identify opportunities', says Mulay. The Council evaluates technology development proposals and provides internal funding for the best ones. The resulting projects develop intellectual property that can be licensed to customers and integrated into their products. 'Such projects demonstrate our ability to offer leading edge technology to our customers. They see a roadmap of the components and technologies we are planning and know that it is not just a single product development project where we can serve them but really in the long-term', says Vasudevan.

The Innovation Council is made up of senior managers but the ideas are gathered 'bottom-up'. 'It is our engineers and project managers who are immersed in the technical issues who have the creative long-term ideas. Management's job is to choose the best ones, based on our analysis of how the resulting technologies and components will, in turn, both increase the quality and speed of NPD for our customers' says Vasudevan, 'and, for example, we have recently developed some key technology for wireless networking'.

Although Wipro Technologies was founded as a provider of contract R&D, it has come a long way. It has become a leader by not only developing technological know-how, but also by developing expertise in NPD processes, excelling at communications, becoming adept at spotting technological opportunities, and managing innovation in general. It is a hotbed of NPD learning that is likely to provide a lot of managerial lessons for the future.