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On the know-how package

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Abstract : The technological heritage is one of the most valuable assets of any R&D organisation. Although the technology is all pervasive, its development and application are still fraught with problems for both users and manufacturers. Technology, however, does not work in isolation. It necessarily acts in conjunction with one another and adds value as an integrated system. The integration of technology, however, does not happen by itself. It rather needs conscious efforts to differentiate with respect to what should be integrated with what and for which purpose. It thus entails the interaction between the world of 'Research', the world of 'Manufacture and Product Application' and the world of IPR and its protection.

In view of the advantages of the potentially opportunistic consequences of global economy, there has been revolution in the market for newer innovative know-how packages. It is vital for our business to be fully acquainted with the commercial opportunities and costs that have arisen from this. Knowledge packages reflects the knowledge captured by the organisations that create them. These packages basically are expected to comprise knowledge of the underlying technical foundations, specific engineering fields, managerial processes, details of the manufacturing environment, users, channels and markets. In reference to the market and context of the application, it, however, leads to the contrasting problems in the management of innovation and its protection. These problems are generally beset with difficulties besides in transferring detailed knowledge, generated by the research and innovation, to the manufacturing site up-stream, to the individuals charged with designing the equipment and to the protection for business development. Intellectual Property Assets can provide the incentives for innovation, product development and technological changes. It is, however, vital that the organisations get itself fully acquainted with the IPR related issues, understands how IPR are accessible, affordable, accepted and enforced internationally and over all maximise the returns from the knowledge driven economy.

The paper intends to discuss the R & D activities that are aimed at the accumulation of specialised expertise in well defined domains and the integration of these domains into coherent system that works well in the

application context. The paper differentiates the technology integration process with respect to the project and the product performance. The paper illustrates the dependence of technology integration on various factors and describes some observation of the project performance with regard to various Intellectual Property matters including protecting IPRs from infringements and deploying Intellectual Property Assets (IPAs) in business development.

Keywords : *Business, Customer, Evaluation, Feedback, Quality, R&D, Satisfaction, Supplier.*

INTRODUCTION

R&D activities are traditionally founded on certain basic premises about how knowledge should be accumulated and communicated. The speed and complexity of modern technology environment have eventually challenged these premises. This in turn has created a gap between traditional research activities and development task generating the need for the integration of process of technology both with the market and IPR issues.

Several studies have shown that the research projects should have close contacts with the changing base of disciplinary knowledge. Research laboratories have thus typically been divided into narrowly specified functionai groups. Each group focuses on building great depth in rapidly changing domain of knowledge viz. Synthesis of nano-materials, amorphous and nano-crystaline soft magnetic materials, sensors for materials characterisation, self propagating high temperature synthesis of zirconium di-boride, titanium carbide Zr/Ti boride and alumina composite or algorithms for conducting rapid searches in parallel computing. This emphasis on deep specialisation and narrow focus in research projects also reflects the scientific method. In order to approach highly novel problems, scientists are taught to minimise complexity by controlling for every possible external degree of freedom. The complexity of the external world is explicitly eliminated by isolating the experiments from the real life situation.

The development, however, calls for completely different priorities rather than studying fundamental problem in isolation. The aim of the development is to define something that functions robustly and reliably in the real World i.e. the market. R&D models are traditionally completed by mechanisms for in technology transfer. Several

academics have studied the activities that provide a bridge between research and development. The research shows that transferring technology from research to development is facilitated/restricted by variety of factors including the protection of the research outputs and its adaptability in the market. The paper discusses the foundation for the study of research and development activities. It has eventually described effective process for research, for development, and for transferring knowledge from one to the other employing the IPR protection.

TECHNOLOGY INTEGRATION

The technology selection activities occur in any project, which envisage the implementation of novel technology. The technology selection is thus a bit like strategy setting. In projects, critical technology commitments are made frequently. The existence of a proactive integral process for making these choices is critical to R&D performance, however. With research this is the creation of individual technological option; with development, this is the execution of a well-defined product concept. Technology integration should thus not replace research and development but leverage both capabilities by managing their interaction.

Technology integration requires knowledge. it should be linked to the fundamental knowledge domains to each other and to their context of application. This is the knowledge of interactions, knowledge of how different discipline influence each other: of how advanced ceramic boards can be improved by coating them with polymers. In sum, the effectiveness of the technology integration process should be driven by knowledge that merges fundamental theories with the details of production systems and user environment. The elements of an effective process for technology integration thus fall into four type of mechanisms viz. Mechanisms for: Knowledge generation, Knowledge retention, Knowledge dissemination and Knowledge application

In summary a good technology integration process should proactively include a broad and informed approach to decision making and problem solving. The process should emphasize experimentation aimed at the early generation of knowledge about the potential impact of the novel approaches on the application context. The knowledge retained through experience and generated by person

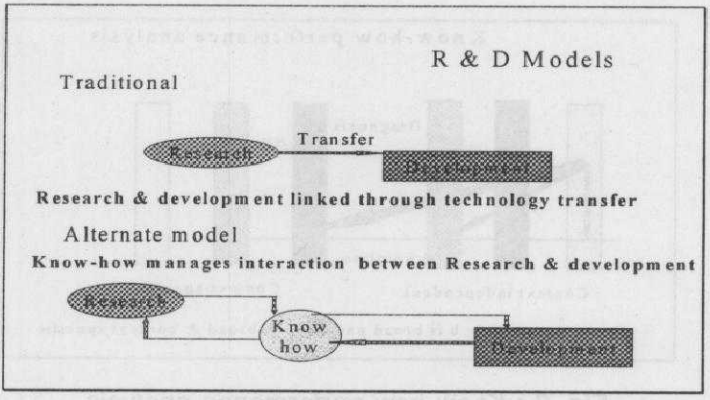

Fig. 1 : R&D traditional and alternate models

experimentation should be integrated by dedicated group of individuals charged with making technology choices with influence over the relevant application context. Analyzing the relationship between technology integration process and performance in a novel and complex environment entails difficult challenges:

- How does one develop accurate and robust measure of the performance of each project?
- How can one guarantee that the sample of organisations includes enough variation in approach to be interesting and representative?
- How can one define a methodology that is structured enough to provide reliable quantitative analysis while being rich and flexible enough to capture the subtlety of the phenomenon one is trying to study?

The very premises that the technological base evolves unpredictably and that the context of application is complex makes these question difficult.

The paper intends to define technology integration and differentiate it with respect to the state of investigation, evaluation, and refined activities aimed at bridging the gap between technical option and application context.

MARKET SAVVY TECHNOLOGY

The mission of any market savvy R & D organisation is primarily that of developing technology aimed at making the company more

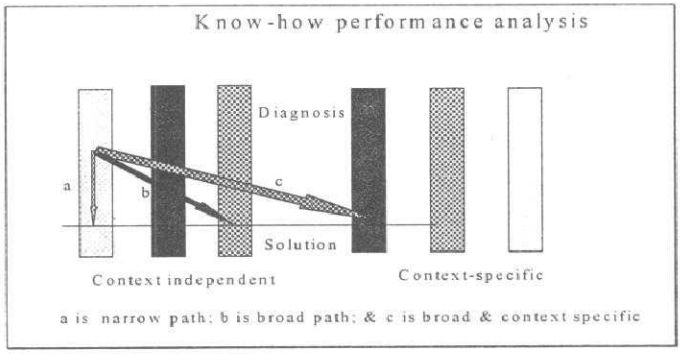

Fig. 2 : Know-how performance analysis

subsequent focus on commercializing those technologies outside the company. As such a wealth of experience has been acquired in technology transfer both internally and to third parties. The benefits of successful technology transfer are well proven and documented. This, as well as the over all investment in the technology development over the past decade, indicates the degree of experience acquired both in the acquisition and the transfer of technology.

There are various definition of a company's intellectual capital the simplest of which is the difference between its market value and its book value. That is the intellectual capital is the sum of tangible strategic assets which have the potential to generate value but which do not satisfy established accounting criteria and, therefore, do not figure on the company 's balance sheet. The concept ofintellectual capital is comprised of three elements:

- Human capital which is made up of knowledge, abilities and experiences of a company's personnel
- Relational capital consisting of the relationship with customers, shareholders, suppliers, government etc.
- Organisational capital framed basically by the organisational culture procedures and processes

TECHNOLOGY TRANSFER

Technology transfer is the communication, adaptation and use of knowledge, abilities and experiences from one organisation or

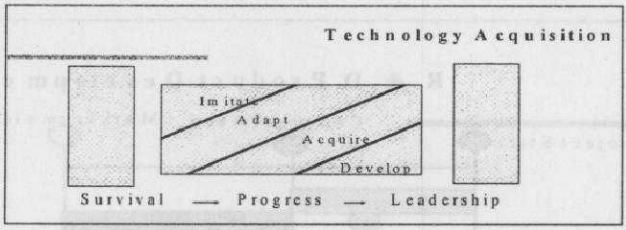

Fig. 3 : Technology acquisition

person to another organisation or person. With the purpose of the recipient improving his results. There is strict relation with the first element comprising intellectual capital as well as with the third element. From these comparison it can easily be informed that an effective transfer of technology will bring about an increase in the intellectual capital of a company and as a result in the company's real value.

Methods of technology transfer

There are two principal methods of technology transfer those involving capital equipment and those referring mainly to intellectual capital in different technical, legal, human and administrative aspects.

Besides the methods for transferring intellectual capital involve training, consultancy, technical assistance, systems, inquiry and design, it involves enforcement of rights.

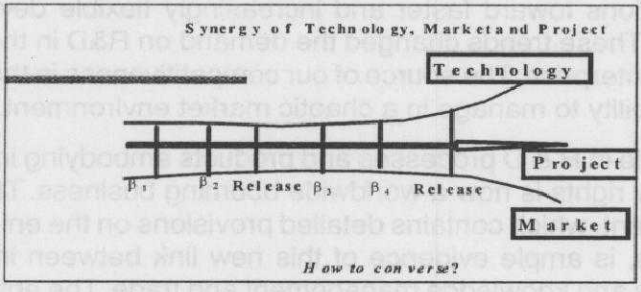

Fig. 4 : Synergy of technology, market and project

The Berne convention contains few provisions concerning enforcement of rights but the evolution of new national and international enforcement standards has been dramatic in recent years mainly

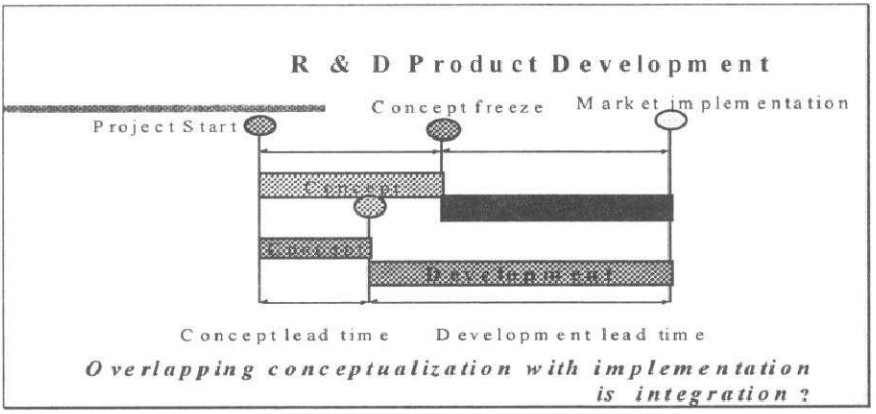

Fig. 5 : R&D product development

due to two principal factors: advances in technological means for creation and use of protected material and secondly the increasing economic importance of the movement of goods and services protected by intellectual property rights in the realm of international market.

ENFORCEMENT OF IPR

The environment surrounding the research institutions changed increasingly quickly. The uncertainty in the market place is now coupled with the uncertainty in the technical base. These uncertainties repeatedly challenged any technical choice and pushed suggestions toward faster and increasingly flexible development project. These trends changed the demand on R&D in the science based enterprise. The source of our competitiveness in the industry is our ability to manage in a chaotic market environment.

The trade in R & D processes and products embodying intellectual property rights is now a worldwide booming business. The TRIPS agreement, which contains detailed provisions on the enforcement of rights, is ample evidence of this new link between intellectual property and knowledge management and trade. The enforcement provisions found in recent national legislation, which may broadly be categorised as provisional measures, civil remedies, criminal sanctions, measures to be taken at the border and measures, remedies and sanctions against abuses in respect of technical devices.

Measures to prevent infringements

In order to prevent infringements from occurring, it is imperative that the judicial authorities may have the authority to order that provisional measures be carried out without advance notice to the alleged infringer. The civil remedies should compensate the owner rights for economic injury suffered because of the infringement, usually in the form of monetary damages and create an effective deterrent to further infringement. The criminal sanctions should be intended to punish those who willfully commit acts of piracy of copyright and related rights on a commercial scale and as in the case of civil remedies to deter further infringement

CONCLUSIONS

If technology was central to competition, why were R&D institutions undergoing such struggle. It seems that while the impact of science and technology on business was perhaps greater than ever, the nature of challenges facing the science based enterprise had deeply changed. Gone are the days of clear objectives, frozen specifications and proven technologies. If we wait until all uncertainties are resolved, the market opportunity will disappear. The leading firms have acknowledged the need for building flexibility into product development and have developed processes charac-terised by rapid and extensive experimentation and interactions in objective and specification - all founded on a solid base of experience and skill and its protection.

The responsiveness required by the emergent Internet environment has sharpened the need for integrating technology. The need for integration therefore goes well beyond achieving good communication within a well-defined project team. This means having knowledge about a diverse variety of external technologies and access to diverse customers. This requires integration way beyond the local project boundaries, reaching into external technology bases and customer needs, accessing talents and knowledge disciplines that were not even expected to be relevant when the first product specification was written.

The efforts made in development of company personnel specifically their training and the search for continuous education represents a highly profitable investment, resulting on an increase with company's intellectual capital.

Traditional R&D models are completed by mechanism for technology transfer. Several mechanisms have been proposed to provide a bridge between research and development. The transferring knowledge from research to development (or from development to manufacturing) is facilitated by a variety of factors including the transfer of individuals from research to the development who are broadly familiar with research and the protection of its IPRs.

The patents are one of the oldest forms of intellectual property protection and as with all forms of protection for intellectual property, the aim of a patent system is to encourage economic and technological development by rewarding intellectual creativity. Under patent protection, both new creation and the further development of existing ones are covered. The enforcement of one's patent is a large subject and it is the patent holder that must negotiate or litigate the infringement of their rights. The enforcement provisions should include measures, remedies and sanctions against abuses in respect of technical means

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