Global Communications Newsletter

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The New Imperative for Innovation in IT: Measurable Business Value

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The future of the information technology industry remains uncertain, even beyond the horizon of the current economic downturn. Several factors indicate that the industry has reached a stage of maturity that is rapidly leading to commoditization.

In such an environment, the role of technology innovation changes dramatically to meet a new set of requirements. Innovation must be tailored to the creation of business value and vehicles for value delivery that are more service-centric than product-centric. Hence, the value proposition of innovation is being increasingly linked to an objective measure of the value delivered by IT to the customer's business. Several frameworks are emerging to quantify such business value.

The Commoditization of Information Technology

As western countries experience one of the worst economic slowdowns in recent decades, the Information Technology industry is one of the worst hit. Two decades of great exuberance, during which the industry enjoyed double digit growth rates, were followed by a sudden and dramatic slowdown.

Simple facts show the harsh reality. The technology stock index Nasdaq fell 75 percent from its highs in early 2000 to its bottom in spring 2003.[1] VC investments are back to mid-1990s levels, and technology spending in the enterprise has been flat or down for more than two years. Information technology has taken the lion's share of the layoffs that have plagued the American industry, with Silicon Valley alone, the heart of the Internet bubble, losing tens of thousands of jobs.

The questions industry analysts are asking themselves are: Is this just a normal cycle of the economy? How long is the downturn going to last? Will IT ever go back to double-digit growth? Economists seem to agree that the prolonged downturn we are experiencing is the natural consequence of the unusually long and steady growth phase that preceded it. And, with the next up cycle already in sight, fears of an extended global recession are easing up. On the other hand, the crisis of the IT industry is expected to have repercussions that will outlive the current economic lull, since they transcend economic cycles. Nicholas Carr provides us with an interesting diagnosis of the situation in his shocking article, "IT Doesn't Matter" [1].

Carr argues that the strategic importance of information technology has started to diminish when its power and ubiquity have reached their peak. As IT's power and presence expanded, companies came to view it as a resource ever more critical to their success. In 1965, less than 5 percent of the capital expenditures of American companies went into IT.[2] After the introduction of the personal computer in the early 1980s that percentage rose to 15 percent. By the early 1990s it had reached more than 30 percent, and by the end of the decade it had hit nearly 50 percent. In recent years, companies have spent over $2 trillion a year on IT. The consequence of these investments is that the core functions of IT (data processing, data transport, and data storage) have become available and affordable to all companies. Their very power and presence have begun to transform them from potentially strategic resources into commodity factors of production.

Now that the economic downturn is forcing companies to make rigorous assessments of their investments, people are starting to realize that IT is "still essential but no longer provides a competitive advantage." This realization has been triggered by the current economic crisis but will not be forgotten once economic growth resumes. In this respect, Carr sees IT as the latest in a series of broadly adopted technologies that have reshaped the industry over the past two centuries,[3] and then gradually became commodities as their availability increased and cost decreased.

The natural conclusion of Carr's argument is that flat spending is likely to give way to a phase of contained growth, but the trend toward lower prices[4] and increasingly narrow profit margins is irreversible.

Implications for Innovation in Information Technology

The key question for the research and development community in IT concerns the role of innovation in this new context of rapid commoditization. How can we innovate in meaningful ways if any competitive advantage can be rapidly commoditized away? What are the right research investments if competition will be mainly based on price?

The IT research community can find the answers in other industries that have gone through the same process, and some of the phenomena that have already appeared in the IT industry.

Other industries well into their mature phase show that the role of innovation has to change from technology-driven to customer-driven. In mature industries, technology providers have to survive on very tight profit margins, since customers have become accustomed to getting increasingly powerful technologies without having to pay a premium for them. In these circumstances, innovation for the sake of technology is unlikely to pay off as it may do in younger industries. These days, nobody would invest in fundamental research on mechanical components unless there was a clear customer demand for new technologies. The

(Continued on page 4)

[1] Although the index was recovering at the time this article was written, it was still 60 percent off its peak.

[2] Source: US Department of Commerce's Bureau of Economic Analysis.

[3] Carr cites the steam engine, the railroad, the telegraph, the telephone, the electric generator, and the internal combustion engine.

[4] As the industry matures, and economies of scale and learning cease to drive costs down, prices are likely to stabilize in nominal terms, but they will continue to drop in real terms.

A Distance Learning Program to Raise Skills of Managers from Russian Telecommunication Enterprises

By Boris Krouk and Olga Zhuravleva, Russia

The development of telecommunications in Russia is entering a new phase; reform in the field of telecommunications is about to begin. The reform process always has political, economic, and social aspects, and at the start is bound up with changes in the structure of industries, revision of technologies, and improvement of the management system.

Reform of the telecommunication industry brings managers of a new type to the forefront: modern managers, capable of running an enterprise under conditions of market competition and leaning on the laws of a market economy.

Today's manager must be proficient in modern methods of marketing telecommunications services, and must evaluate the competitive ability of his enterprise, plan and forecast its activities within the developed strategies, and run finances, recourses, investments, and personnel. There is no doubt that today the telecommunication industry is being filled up with managers of a new type, but most managers at telecommunication enterprises and their branches in the Soviet era practiced in a planned economy and command-administrative management. They cannot quickly adapt to the mechanisms of a market economy, and therefore fail to run the industry effectively. At the same time, frequently these are people with great practical experience, who know the industry very well. They need new knowledge of market economy laws, and methods to manage production, enterprise, and industry in new market conditions.

A distance learning program, "Modern strategies of telecommunication enterprise management," has been created at the Siberian State University of Telecommunications and Information Sciences. This program is helpful for staff who will determine the policy of telecommunication enterprises, promote the rapid expansion of service and production markets, improve their quality, and, in short, form numerous groups of managers.

The DL program covers the most efficient management techniques for telecommunication enterprises. This learning program would not have come into the world without financial support from the International Telecommunication Union, and organizational support from the Regional Community of Communications and many joint-stock telecommunication companies as well as the telecommunication operators of Sibdalsviaz. The content of the program was discussed at an enlarged meeting of the Council of Association and approved by the heads of the joint-stock telecommunication companies.

The program includes the following topics: the place of the telecommunication industry in the system of market relations; basic regulations of telecommunication development; elaboration of telecommunication technologies as an infrastructure of economics; analyses of external and internal environment of an enterprise; estimation of enterprises' compatibility; pricing in telecommunications; planning and forecasting methods; elaboration of the business plan of enterprise development; financial management; investment management; cost management; and personnel management.

The learning goal of the program is to have an idea of modern strategies of telecommunication enterprise management and to show the components that form these strategies.

By the time trainees have completed learning the material, they have an idea and knowledge of:

- General regulations of telecommunication development
- Marketing activity in telecommunications
- Elements of the management of telecommunication enterprises
- Methods of marketing analysis
- Methods of planning and forecasting an enterprise's activity
- Methods of pricing

They are able to:

- Evaluate the position of telecommunication enterprises in the market of telecommunication services
- Evaluate the competitive activity of an enterprise
- Elaborate optimal strategies for an enterprise's development

The learning material of the program is divided into self-instructional units. This structure allows step-by -step learning, each step paying attention to a particular unit. The learning objectives of the course and each unit are clearly determined. The learning material is self-sufficient and lets trainees to do all types of training work and achieve stated learning objectives. The material is oriented to self-study; trainees have an opportunity to make calculations, solve different problems, and do practical exercises.

Every unit has self-assessment questions and tasks, which will enable a trainee to check progress and mastery of the learning material.

The structure of the learning material contributes to the interaction of a trainee, and allows him/her to communicate with trainers, tutors, specialists, and other course participants.

Every unit has self-assessment questions and tasks, which will enable a trainee to check progress and mastery of the learning material.

The learning program provides trainees with tests, which are checked and evaluated by trainers. The learning material is also provided with access devices such as course guides, course content, curriculum, the schedule for submitting papers for examination, trainers' email addresses, the list of advisable reading on every unit, learning objects of the program, and reference materials.

A number of performance problems (case studies), which require analysis and trainees to make decisions, are included in the learning program. To discuss those problems with other participants, trainees have access to a Web conferencing system offline taking into account different time zones.

To manage trainees' study there is a billboard, where one may put all general information, and personal trainee portfolio with necessary materials.

The interaction between the trainee and the learning material is carried out by means of an interface. In this program, *interface* means the design of a display where the trainee observes material. All materials are issued in HTML, with all necessary hyper references for convenient navigation through course material.

HTML learning materials elaborated by programmers are given to the site administrator, who publishes them in the Internet. Trainees may observe learning materials both online and in an autonomous regime. The main objective of distance learning is to provide interactive training. For this purpose, dynamic Web pages are elaborated on the Active Server Pages platform. Integrated application of ASP and databases allows providing trainees with access to resources of the Web site as well as giving information about grades received in the learning process, possible debts, and current assignments.

On the basis of ASP, VBScript, and JavaScript, programs

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Distance Learning Program
(cont'd)

for distance testing of trainees are developed. Software for group work and case study, which permits holding discussions on learning issues with forum and chat technologies, is elaborated in the DL center.

Communication activity provides great support for the trainee who is isolated from the institution: communication with administrative staff, trainers, tutors, and other course participants. This allows trainers to quickly answer trainees' questions, identify their difficulties as well as render immediate assistance, form a sense of constant community among a dispersed group of trainees, compare their own study progress with that of other course participants, and give mutual assistance.

On the developed site one of the main means of communication is email. Through email trainees send their papers and other outcomes of their activities to the DL center. By email they send questions and receive answers and reviews of accomplished assignments.

For the convenience of trainees the email is mounted in a learning module, thereby enabling the sending of messages (a question, an accomplished assignment, a draft, a project, etc.) without interrupting the work in the learning module. The other channels of communication are a debating forum and a billboard.

The management scheme of the distance learning program is shown in Fig. 1.

In 2002 pilot courses of the developed distance learning program were conducted. Since then, regular courses have been conducted for the managers of telecommunication enterprises from various regions of Russia (Novosibirsk, Khanti-Mansiysk, Irkutsk, and others.)

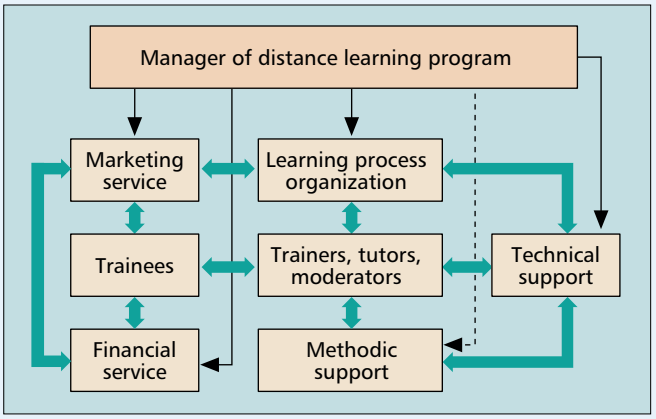

Figure 1. *Management of the distance learning program.*

All course participants are provided with questionnaires to evaluate the quality of training in accordance with ITU requirements.

Processing of questionnaire results has allowed us to draw the following conclusions: almost all course participants speak positively of the quality of training; they point out that the course is up-to-date and express their interest in it; and the course turns out to be very useful for enterprise employees' practical work.

Technical Report on ICN 2004
February 29–March 4, 2004
Gosier, Guadeloupe, French Caribbean

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The 3rd International Conference on Networking (ICN 2004) took place February 29–March 4, 2004, Gosier, Guadeloupe, French Caribbean. It gathered approximately 200 participants originating from 32 different countries (http://conf.uha.fr/ICN2004.html).

The conference took place under the technical co-sponsorship of IEEE, and was supported by many other individuals and organizations. We recall that the charter of the conference is to acknowledge the highest technical standard, while promoting the best young researchers along with well-known experts. Additionally, another goal was to logistically assist local organizing teams that usually cannot get grants to organize such large international conferences.

As were other ICN events in the past, this professional meeting continues to be highly competitive and very well perceived by the international networking community, attracting excellent contributions and active participation. The topics of submitted papers covered a wide spectrum, including optical communications, QoS, multicast, security, traffic engineering, routing, wireless networks, and ad-hoc networks. We believe ICN 2004 papers offer a wide range of solutions to key problems in networking, and set challenging avenues for industrial research and development.

In addition to the regular sessions, four tutorials were organized. The tutorials focused on broadband network management, quality of service in UMTS/WLAN networks, design of real-time multimedia systems, and Web services for value-added services engineering in next-generation networks.

We would like to thank the ICN 2004 Technical Program Committee members and the referees. Without their support, the creation of a very broad conference program would not have been possible. We also thank all authors that dedicated a particular effort to contribute to ICN 2004. We truly believe that due to all these efforts the final conference program consisted of top-quality contributions.

We are also indebted to many individuals and organizations that made this conference possible, specifically France Telecom, IEEE, IEE, ARP, Antilles-Guyane University, and the University of Haute Alsace. In particular, we would like to thank the members of the ICN 2004 Organizing Committee for their help with all logistical aspects of organizing this professional meeting.

path to profitability for companies that sell mechanical devices is to create value through solutions that solve their customer's problems, and the more elements of the solutions they can reuse across different customers, the more profitable they are. This fine balance between customization and repeatability of the solution is the key to success in a mature industry.

There are clear indications that the IT industry is following the same path, also because the customer for IT within the enterprise has changed, as Geoffrey Moore[5] points out in a recent analysis [2]. The primary sponsors of IT purchases are no longer the technical buyers (IT director and technology evaluator), but the economic buyers (financial executives and line of business [LOB] executives). These people are not interested in the latest technological features, so the sales dialog is about the customer's problems, not about the technology differentiation of the vendor's products. Differentiation comes from how technology makes a difference to the customer's business.

Another important aspect is that services are displacing products as the goods sold to the customer. In selling a service, one cannot exploit innovation in terms of pricing new product features. Technical innovation has to become a weapon to deliver the service in a more efficient or useful manner, thus reducing the cost of delivery or increasing the value delivered to a customer. In both cases, innovation cannot take place in the ivory towers of research laboratories, but has to happen at the interface with the customer. For instance, with the huge trend toward outsourcing IT functions, the only thing customers pay for is the level of service provided. In that context, the customer doesn't even get to see what technology is behind that service, so the providers of IT services have to invest in innovation that enables the delivery of a higher level of services at a lower cost.

[5] *Geoffrey Moore is the author of* Crossing the Chasm*, the most popular book on marketing strategy for innovative technology.*

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The main consequence of these trends is that the allocation of R&D budgets in IT companies will be scrutinized in terms of the business value that innovation will deliver to the end customer. Therefore, the imperative for innovation in the IT industry is to be channeled toward assets whose business value can be quantified and measured.

Three Measures of Business Value

The awareness that the value proposition of IT to enterprise customers needs to be linked to an objective measure of the value delivered has triggered a flurry of activity around the development of frameworks and tools to measure business value.

These frameworks and tools attempt to define business value metrics around the notions of business performance improvement and/or cost reduction, and to use the metrics to demonstrate how investments in specific IT solutions improve business performance or reduce cost.

The main obstacle to the broad adoption of this approach is the fact that no framework has been broadly accepted yet as the standard vehicle for doing this. The existence of several proprietary frameworks[6] targeted at slightly different purposes indicates that the discipline is still in its infancy and in full ferment. Most frameworks are built around the notion of key performance indicators (KPIs) as the key element to assess business improvement, and consequently calculate business value as positive impact on KPIs. However, the various frameworks take different approaches, depending on whether they are industry-specific[7] or not, and whether they focus on specific classes of IT investments. Industry-specific frameworks, such as the Supply Chain Operational Reference (SCOR) model for manufacturing [3], are typically closely tied to the business processes germane to that industry. Other frameworks look at problems such as the ability of IT investments to enable new business models and directions, support mergers and acquisitions, and minimize cost of change.[8]

The bottom line is that these frameworks will converge and consolidate around a few that will provide the standard reference to define business value. At that point, the accuracy of the tools that calculate the return on investment (ROI) of specific IT solutions will be higher, since it will be possible to benchmark different calculations against a standard framework. Until then, the measurement of business value will be an imperfect science, but one of increasing importance to the people in charge of investing in technical innovation, because customers are already asking for measurable business impact.

References

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Biography

Giuliano Di Vitantonio is department manager at Hewlett-Packard Laboratories, Palo Alto, California, where he is responsible for the Enterprise Solutions Department. His research interests cover business value analysis of IT, business-driven management of IT, IT-based business processes, and content workflow solutions. He holds a Master's degree in electrical engineering (specialized in telecommunications) from the University of Bologna, Italy, and an M.B.A. from the London Business School, United Kingdom.

[6] *Among these, often cited are the Gartner Business Performance Framework™ (GBPF) [4] and the American Productivity and Quality Center (APQC) Process Classification Framework [5].*

[7] *The industry in question is the customer's industry, since the customer wants to know how an investment is providing an advantage vis-à-vis the competition.*

[8] *An example of the latter is HP's Agility Assessment Service (AAS) that assesses the ability to change based on the agility metrics (time, range, and ease) [6].*