Business Process Reengineering for the Use of Distance Learning at Bell Canada

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EXECUTIVE SUMMARY

The Bell Online Institute (BOLI) represents a radical change to the way Bell Canada provides internal training to its 27,000 employees. BOLI specializes in Web-based training, one type of technology enabled (distance) learning. Web-based training is a significant departure from the more traditional classroom-based practices at the Bell Institute for Professional Development, which is the organization that oversees all employee training at Bell Canada. This case study examines the use of Web-based training at Bell Canada in the context of business process reengineering. We present a theoretical context and a practical guide to how technology enabled learning changes the business processes in an organization. The study defines the processes that are required to deliver Web-based training, the value to the internal and external business practices of the organization, and the costs for each process. The wider applications of this case study are identified and will be of interest to those in other organizations that are moving from classroom delivered training to distance delivery.

This case study describes changes in the organization that result from reengineering, including the impact Web-based learning has on training plans, student needs assessments, the ability to provide specialized curricula, training students and instructors in using new technologies, and establishing a principle of continuous improvement. Alternative ways of achieving project objectives are presented, along with organizational impact, technology alternatives, and cost-benefits.

BACKGROUND

The telecommunications industry in Canada has undergone dramatic changes within the past few years with deregulation, rapidly changing technologies, and the globalization of business practices. A downsizing effort at Bell Canada in response to the changing nature of the telephone industry has affected almost every area of the company, with the internal training function being no exception. The Bell Institute for Professional Development (BIPD) is the business unit that oversees all internal training activity at Bell Canada. BIPD has been re-invented over the past 3 years, and changes are still on-going. The first change occurred in 1995, when all training that had once been conducted in-house by BIPD was outsourced to 4 companies known as the "training partners." BIPD's role changed from that of training provider to strategic planner. The second change occurred in 1997, when a decision was made at the corporate level to increase the use of distance learning for training delivery to Bell Canada employees.

Methodology

In a work which predates the concept of business process reengineering, Jim Stewart (1991), sums up the role of training in achieving organizational change when he states that organizational change can happen only when individual change occurs through learning. While there are a great number of published methodologies for applying BPR concepts, one model that emphasizes organizational transformation is the "6 R's" of business process reengineering by Johnson A. Edosomwan in *Organizational Transformation and Process Reengineering* (St. Lucie Press, 1996).

Edosomwan's 6-R's methodology draws upon previous well-known works on business process reengineering. Michael Hammer, the originator of the business process reengineering concept emphasizes the need for complete redesign of the organization to accomplish reengineering objectives. In *Reengineering the Corporation* (Hammer and Champy, 1993), identify innovation, speed, customer service, and quality as key success factors in the process. Other authors have also applied the original concepts of business process reengineering to specific situations such as training. In *Reengineering the Training Function* (1996), Donald Shandler describes preparation, process identification, vision development, solution formulation, and transformation as major reengineering elements and clearly shows how they apply to corporate training.

The advantage of the 6-R's approach is that the methodology is concise, yet well-defined.

Below is a summary of the 6-R's methodology:

I.   Realization

Realization is the understanding that dramatic changes are needed to meet the needs of organizations, teams and individuals and support the changes in the organization that occur due to rapidly evolving economies and technologies; and the re-design practices to fit with the organization's business objectives.

II.   Requirements

The identification of strategic direction for the reengineering effort requires an analysis of customer needs. Decisions may then be made about the products and services that will fill the gap between the desired outcome and the processes, products, and services that are needed.

III.   Rethink

New structures and systems must be put in place to accomplish the objectives of the reengineering program. Here, new procedures, processes, and technologies are identified.

IV.   Redesign

At the redesign stage, specific targets are set for implementing the reengineering process.

V.   Retool

At this stage, technologies or other more competitive systems are evaluated and adapted to the reengineering project.

VI.   Reevaluate

During reevaluation, performance indicators are measured to determine how well the reengineering effort met its goals.

SETTING THE STAGE

Distance learning is an example of a changing business practice that Bell Canada hopes will improve both the bottom line and the quality of training delivery. Training is a significant employee benefit and employees at Bell have been very interested in the changes to training delivery that are occurring in the organization. The Bell Online Institute was created in order to explore the possibilities for using technology enabled learning in the organization. Web servers were procured

for this purpose, and a core team was established with expertise in corporate training delivery, technology, and business development. Other interested parties were consulted as necessary, such as representatives from end-user groups. Distance learning has several obvious advantages over classroom training that needed to be explored:

- convenience and flexibility in the time, geographic location, and pace of training delivery, and
- cost savings over current classroom based training based on reduced training time and travel savings.

A related change to the organization was the establishment of Bell Learning Solutions, a business unit that provides distance learning services to customers through consulting, reselling third party products and services, and creating and marketing technology based course content.

CASE DESCRIPTION: 6-R Analysis
I. Realization: Establishing the Need for Business Process Reengineering

In the past year, there has been a great deal of interest in distance learning within Bell Canada. One of the reasons that BOLI was established was that Bell Canada believes that technology enabled training adds value to the training program. Employees find attending classes increasingly difficult to coordinate with their work schedules and believe that distance learning will offer them more convenience and flexibility than classroom based training. Classroom training is an "event," requiring pre-registration and courses offered at fixed periods of time, at a location apart from an employee's normal place of work. Distance training delivery to the desktop is one alternative that can provide continuous learning to employees. From a management perspective, distance learning offers cost savings over current classroom based training and enables employees to acquire and retain the skills necessary for Bell Canada to complete effectively in a global marketplace.

Outsourcing

Before 1995, BIPD conducted all employee training at Bell Canada. BIPD had a $40 million budget, classroom space, and 426 employees working in course design and delivery, as well as in administrative support functions such as project management, technology support, registration and course logistics. In 1995, training at Bell Canada was outsourced to 4 training partners. One company provides telecommunications technology related training, a second company provides information technology related training, a third company provides "soft" skills training in areas such as leadership and management, and the Bell Online Institute provides support for distance learning. Courses once offered by BIPD were on the topics of telecommunications, information systems and technology and general business skills, the same subject areas now covered by the training partner companies.

After outsourcing, the BIPD budget was $9 million and staff was reduced to 60 employees. Training partners also now provide classroom space as one of their outsourcing services along with all required course materials. The demand for employee training remains strong. In 1997, 14,000 students, equivalent to 43,300 student days, were taught at BIPD through the training partners.

Current Assessment

The current situation points to several possible directions for BIPD. These include:

- the need to reduce cost of training delivery
- the need to update course curriculum frequently so that topics of current interest are provided as they are required by the workforce to carry out their jobs, and reflect the evolving computer and telecommunications technologies used in the organization
- the need to provide high quality training
- the need to give end-users flexibility in the location where they take training
- the need to reduce training time by focusing training very specifically on topics needed by clients to carry out their jobs, and

- the need to align training with profit-making business ventures of the company, i.e., the support of Bell Learning Solutions, a business unit that designs and delivers tailored solutions to customers interested in implementing distance learning in their own organizations.

II. Requirements: Defining Customer Needs

BIPD's Strategic Role

BIPD now functions primarily in a strategic role to set the direction for training within Bell Canada and is the liaison with the outsource training partners. Liaison activities include building business relationships, identifying pricing and contract issues, and ensuring that internal customer needs are met. A customer services team of BIPD learning professionals has specialists dedicated to specific groups of Bell Canada employees to ensure that employee training needs are addressed. For example, a specialist may do an evaluation of an employee group to identify performance gaps and then put the employees in touch with one of the training partners to help fill those gaps through appropriate courses.

There is no transfer pricing done between the business units of employees taking courses and BIPD. However, the training partners do charge Bell Canada business units for courses employees take. Business units are given their own training budgets which they may use where they wish, and are not limited to the courses offered by training partner companies only. If an employee does takes a course through one of the training partners, payment is made directly to the partner company and BIPD gets no part of the payment. Tuition fees vary from course to course, depending upon course features such as the length of the course, the venue, and whether there is a need for equipment rental.

Both supervisors and employees themselves may make the decision to take a course at BIPD and balancing the needs of these two client groups is important. On the one hand, employees need the opportunity for personal development, while on the other, the needs of the corporation must be at the heart of BIPD's program. There is shared accountability between the employee and the employer when an employee takes a course; when an employee signs up for a course, a copy of the registration form goes back to the employee's supervisor.

The idea for a new course often comes from the training "customers" themselves. For example, a call center supervisor may feel that there are problems with his staff that a formal training session could remedy. BIPD would respond by using a set of diagnostic tools to determine whether the supervisor is correct and a course is the best solution to the problem. If the development of a new course is indicated, the next step would be for BIPD to bring in the appropriate training partner, who would use a standard instructional design systems process to move from the "idea" stage to developing an actual course. If a suitable instructor is not already on the staff of the training partner, the partner company would find an expert in the field and, if necessary, train him to be an effective trainer.

Before outsourcing, BIPD operated at a tactical level, performing all aspects of employee training in-house from instructional design to course delivery. Now, BIPD spends much more time identifying how training can address the needs associated with supporting Bell Canada's key business issues, for example, changes in the technologies the company sells, or even change management issues themselves. Apart from planning training strategy and management of outsourcing partnerships, BIPD is also still responsible for executive education, employee orientation, career management, technology support, and administrative support.

Included in BIPD's strategy for the coming year is the exploration of training options with the highest learning value to ensure a competitive advantage for Bell Canada. Within that strategy, the organization wants to evolve the technology-based learning capability within Bell. BIPD's key success factors in implementing this strategy are:

- the availability of human and financial resources
- the shared commitment of the training partners
- the availability of suitable computer systems to end-users and the ability of end-users to adapt to a technology enabled training environment

Table 1: Analysis of BIPD Before Distance Training Delivery

STRENGTHS	WEAKNESSES
• outsourcing has created opportunity for flexibility in training provision • outsourcing has meant that BIPD functions on a strategic rather than an operational level • senior management committed to using new technologies for training delivery and for new profit-making opportunities	• classroom training has high cost • course curriculum does not always reflect end-user needs for current topics of interest due to evolving job requirements and changing technologies
OPPORTUNITIES	THREATS
• end-users requesting training at their desktops • needs to be alignment with BIPD and Bell Learning Solutions, a business unit which delivers distance learning solutions to customers	• deregulation of telephone industry has increased need for broader business opportunities • changing technologies and globalization has increased need for current information

- the ability to move quickly with a shorter cycle time, and
- the availability of learning applications that meet the needs of customers and the business needs of Bell Canada.
   Table 1 presents an analysis of the strengths, weaknesses, opportunities, and threats at BIPD.

Recommendations
   From the analysis above, several next steps can be identified:
- research costs of Web-based training
- research Web-based learning platforms
- test usability of platforms and acceptance of distance training through a pilot project
- identify further courses for distance delivery within the coming year
- get commitment of training partners to support a distance learning strategy, and
- increase use of Internet / intranet delivery of training.

III. Rethink: Integration of Appropriate Technologies

Distance Learning Initiatives at Bell Canada
   The challenges of deregulation, globalization, and constantly evolving technologies represent both threats and opportunities for the company. On the one hand, increased competition has necessitated drastic re-organization and painful cost-cutting, as well as high levels of stress for employees due to the new, and often unknown, demands the current reality brings. However, employees are rising to the challenge and evolving the business into new areas that draw on many strengths in the company. One of the new ventures is the provision of consulting expertise and distance learning outsourcing to customers through Bell Learning Solutions, an end-to-end business unit. Bell Canada has 20 years of experience in the distance education field. Bell has explored the internal use of various distance training methods and has also provided customers with distance learning technologies such as video-conferencing and business television. The many business activities in the company have allowed for the re-deployment of much expertise related to distance learning, for example a wide variety of Internet and electronic commerce applications.
   Distance learning, like the current classroom training, is outsourced to the training partner companies. In-house, BIPD is developing expertise in instructional design related to multimedia

materials in order to work effectively with the training partners. Partnership with the Bell Online Institute (BOLI) is BIPD's first initiative in Web-based training. The Bell Online Institute (BOLI) is Bell Canada's business unit that delivers technology-enabled training to Bell Canada employees. BOLI also functions as a testing ground for various Internet-based learning platforms used for training delivery at Bell Canada.

The Bell Online Institute has no direct reporting relationship with BIPD. Because BOLI has been independent of the existing training infrastructure, there has been more opportunity for creativity in that organization. BIPD uses the products that BOLI develops to provide services to the end-users. Courses that are developed by, or for, BOLI become part of the BIPD curriculum that is updated and managed by the training partners.

The use of distance learning has encountered no resistance from BIPD staff because it represents an interesting challenge rather than a threat. The real changes to training delivery at Bell Canada happened when outsourcing occured several years before distance learning was introduced. To BIPD, distance learning is simply a service supplied by the training partners in response to "customer" demand.

Profit-making opportunities for Bell Canada have increased from the establishment of BOLI. Bell Learning Solutions is a business unit created to re-sell Bell Canada expertise in the area of distance learning to external customers. Basic products of Bell Learning Solutions are consulting services, course production in a distance format, and re-seller services for course content from many different sources. The Bell Online Institute acts as the technical resource to fulfill customer needs for course production and technical expertise in consulting projects. While the Bell Institute for Professional Development, Bell Learning Solutions, the Bell Online Institute, and the other training partner companies are independent organizations, they are also able to work together to meet a wide variety of internal and external customer needs. For example, the Bell Online Institute, the Bell Institute for Professional Development, and Bell Learning Solutions have partnered with an SAP implementation partner to design and deliver SAP training internally to Bell Canada employees.

One of the other benefits that Bell Canada expects will come with the use of distance learning is that courses will be available to employees without a formal registration and approval process. As well, employees will not need to leave their normal place of work. The result may be an increase in the amount of training delivered to employees, making employees well-equipped with knowledge that they can use to deal with constantly changing job demands, right at their fingertips.

Continuous Improvement and Alternative Delivery Options

In choosing an appropriate technology to deliver the courses in the distance learning pilot, the advantages and disadvantages of various modes of delivery were analyzed.

Web-based course delivery is one of the alternatives to classroom delivery. Other technology options include business television, video-conferencing, audio-graphic conferencing, and CD-ROM or other type of computer based training (CBT). Depending on instructional design considerations that in turn depend on the needs of users and the type of course material being presented, these technologies could be used as alternatives to Web-based delivery or as an extension of the capabilities of the Web. For example, CD-ROMs may contain hot-links to Internet or intranet sites, and video-conferencing and business television can broadcast Internet applications to students.

A major part of business process reengineering is continuous improvement. In Bell Canada's case, this means continuously evaluating which technologies are most appropriate for the training required. Tables 2 and 3 below give a comparison of the advantages and disadvantages of distance delivery using CD-ROM, intranet, Internet, audiographic or video-conferencing, and business television compared to classroom delivery. Comparisons are made on the basis of organizational impact and costs.

IV. Redesign: Setting Goals for Performance Improvement

BIPD has established a 1998 goal of moving 20 percent of the current curriculum to a Web-based distance learning platform. This represents a four percent increase in the materials currently

Table 2: Comparison of Classroom to Distance Delivery Using CD-ROM, Intranet or Internet

	Classroom	CD-ROM	Intranet (Web)	Internet (Web)
Mode	Live	Asynchronous	Synchronous / Asynchronous	Synchronous / Asynchronous
Availability to Bell Canada Employees	High (although some employees must travel)	High	High	High
Possible Methods of Communication	Live lectures, Q&A	Telephone Fax E-mail	E-mail Discussion groups Live text chat Synchronous audio or video	E-mail Discussion groups Live text chat Synchronous audio
Student and Instructor Interaction	High	Low	Medium (potential for real-time text, audio and video)	Medium (potential for real-time text and audio)
Interactive Exercises	No (although breakout possible)	Yes	Yes	Yes
Effective Course Presentation	Excellent (interaction with instructor possible)	Good (limited communication)	Excellent (interaction with instructor possible)	Good (graphics, video and real-time communication slow)
Easy Access to External Resources	No (although may access Internet from separate application)	Yes (if use hotlinks to connect to Internet/intranet sites)	Yes (if have Internet connection)	Yes (to other Web sites)
Easy to Use	Yes	Yes (with initial instruction)	Yes (with initial instruction)	Yes (with initial instruction)
Easy to Update Course Information	No (if use printed course materials)	No (need to press and redistribute)	Yes	Yes
Distribution Cost	Medium/high depending on travel required	Low/medium (depending on # of updates)	Low	Low

available in a distance learning format, and is equal to an additional 32 courses. Most of the 32 courses will be developed and delivered as Web-based training, as BIPD feels that offering courses via the Bell Intranet is a solution that will best meet the needs of most employees.

The Web offers significant advantages over CD-ROM based training, such as the ability to update materials quickly and inexpensively, and the ability to reach virtually all employees without the need to physically distribute course materials. There is also the benefit of the larger storage capacity of a server as opposed to a CD-ROM, allowing the use of more multimedia elements such as animation and video. The primary means of distance delivery is expected to be through the corporate intranet or the Internet. Due to relatively high costs and limited flexibility, little use of video-conferencing or business television is expected.

BIPD presently has 150 independent study courses on CD-ROM or diskettes. It is assumed that all of these courses could potentially be taught using any of the asynchronous platforms. There are presently 700 classroom-based courses offered through BIPD. It is estimated that 10 percent of these could be potentially offered using the Centra Symposium synchronous platform.

In order to judge the cost-effectiveness of a distance training solution, economic analysis is required and a positive return on investment is determined. To test the economic benefits and feasibility of using Web-based training in the organization, a pilot project was designed.

V. Retool: Testing of the Concept

Bell Online Institute Pilot Project
The Bell Online Institute piloted three Web-based courses in 1997 to measure the cost, and

Table 3: Comparison of Classroom to Distance Delivery Using Audio-graphic or Video-conferencing, or Business Television

	Classroom	Audiographic Conferencing	Video Conferencing	Business Television
Mode	Live	Synchronous	Synchronous	Synchronous
Availability to Bell Canada Employees	High (although some employees must travel)	Medium (requires multimedia PC or equipped room)	Medium (requires multimedia PC or equipped room)	Low (requires broadcast studio and receiving sites)
Possible Methods of Communication	Live lectures, Q&A	Live voice White board	Live audio and video Can include White board	Live audio and video Can include White board
Student and Instructor Interaction	High	High	High	Medium (potential for real-time communication)
Interactive Exercises	No (although breakout possible)	No (although breakout possible)	No (although breakout possible)	No (although student polling possible)
Effective Course Presentation	Excellent (interaction with instructor possible)	Excellent (interaction with instructor possible)	Excellent (interaction with instructor possible)	Excellent (interaction with instructor possible)
Easy Access to External Resources	No (although may access Internet from separate application)	No (although may access Internet from separate application)	No (although may access Internet from separate application)	No (although may access Internet from separate application)
Easy to Use	Yes	Yes (with initial instruction)	Yes (with initial instruction)	No (requires scripting and television production)
Easy to Update Course Information	No (if use printed course materials)	No (if use printed course materials)	No (if use printed course materials)	No (if use printed course materials)
Distribution Cost	Medium/high depending on travel required	Medium	High	High

evaluate the effectiveness, of training delivered on four different Web-based learning platforms:
• WebCT (http://www.webct.com/) developed at the University of British Columbia
• Mentys (http://www.globalknowledge.com/) from Global Knowledge Network
• Pebblesoft (http://www.pebblesoft.com/), and
• Centra Symposium (http://www.centra.com/).

In order to obtain an accurate picture of Web-based course production in the marketplace, the three courses designed for delivery on these learning platforms were produced by three independent vendors. Before these three Web-based courses were developed, 16 percent of BIPD's curriculum could be offered in a distance format, but these course materials were on paper or audio-video cassettes. All of the courses were on telecommunications topics: TCP/IP, frame relay, and routing, and all of the courses were estimated to be equivalent to 2-day classroom courses. The pilot courses were delivered to engineers working in Bell Canada's Advanced Communication Systems group.

Three of the learning platforms, WebCT, Mentys, and Pebblesoft present course materials asynchronously. Asynchronous course delivery uses network communication that is not done in real time; for example, online discussion groups, e-mail, and the use of HTML pages. In other words, course materials reside on a server on an on-going basis and may be accessed at the student's convenience. The frame relay course on the Pebblesoft learning platform was authored in French. Both asynchronous courses took students approximately two hours to complete.

The fourth platform, Symposium, is a synchronous learning platform using 28.8 Kbps delivery

over the Internet or an intranet. Synchronous course delivery involves real-time network communication such as audio or video conferencing, or text-based chat groups. The Symposium system supports text, graphics, and animation to present course materials. Shared features for system users include audio communication among the course participants and the instructor, an electronic white board, an Internet browser, and a live text chat room.

The course on the topic of routing was delivered on the Centra Symposium platform. The pilot course was delivered to 20 Bell Canada engineers from Quebec City, Montreal, Ottawa, Toronto, and Hamilton. The course was offered in two parts, one in the morning and one in the afternoon. The morning session lasted two hours and the afternoon session lasted one hour, for a total of four hours. All the engineers were present for the entire course.

The course was highly successful with participants reporting that they felt their needs were being met with flexible, convenient course delivery on topics that were of current interest for their job activities. Testing indicated that learning for all courses was as effective as classroom training.

VI. Reevaluate: Evaluating the New Process

Course Production Costs

Cost is one of the key performance measures in business process reengineering. In their report *Methodology for Cost-Benefit Analysis of Web-Based Telelearning: Case Study of the Bell Online Institute* (in press), Whalen and Wright examine the costs for the business process needed to produce
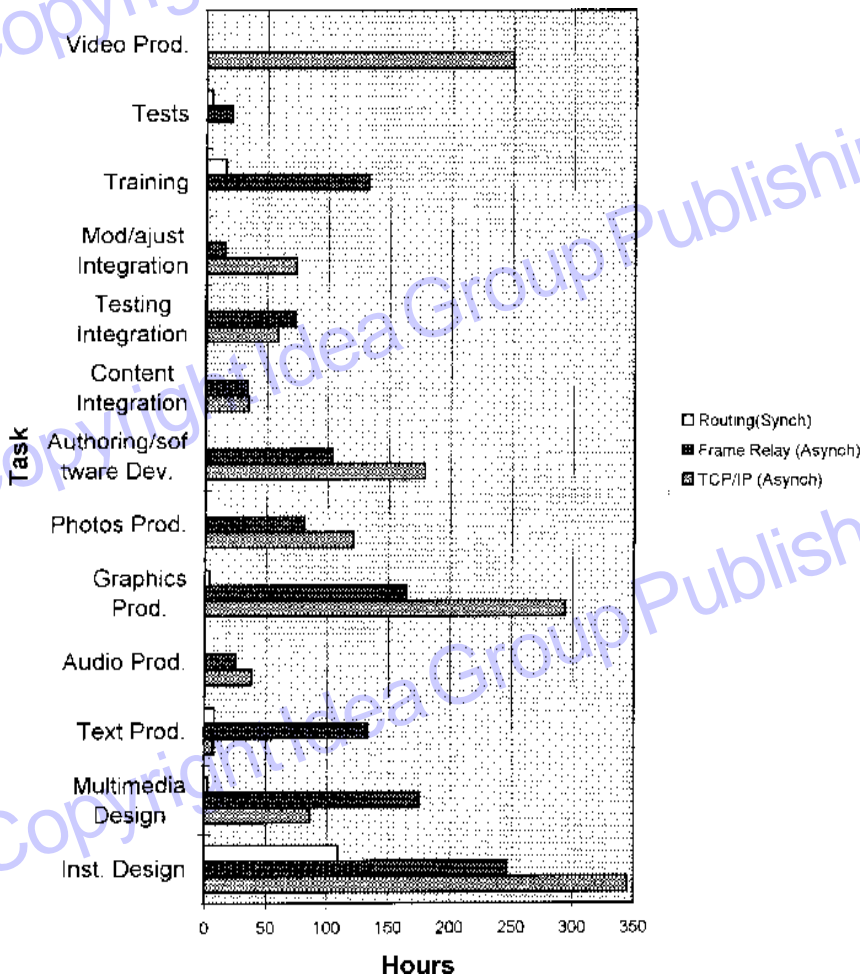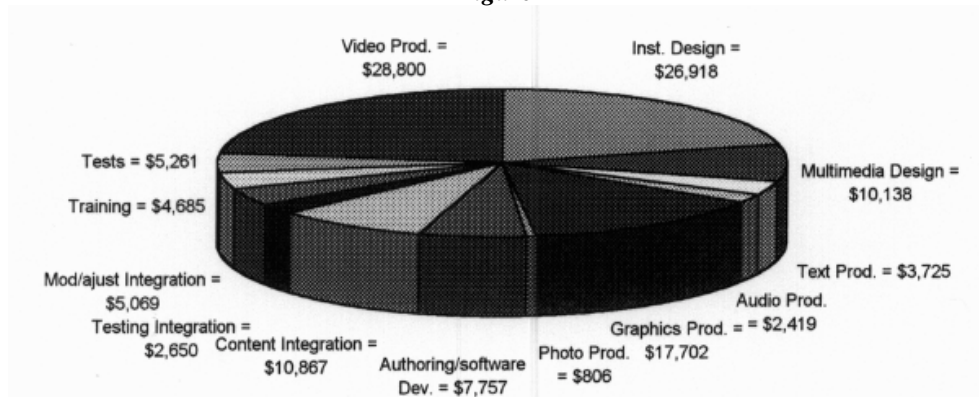
Figure 1

Figure 2

Video Prod. = $28,800
Inst. Design = $26,918
Tests = $5,261
Multimedia Design = $10,138
Training = $4,685
Mod/ajust Integration = $5,069
Text Prod. = $3,725
Audio Prod.
Graphics Prod. = = $2,419
Testing Integration = $2,650
Content Integration = $10,867
Authoring/software Dev. = $7,757
Photo Prod. $17,702 = $806

a Web-based course. These processes include: instructional design, multimedia design, the production of text, audio, graphics, photographic and video elements, authoring and software development, content integration and modification, and training and testing design and delivery.

Figure 1 compares each costing element across all courses. There was some variation in the use of any particular element among the courses, although the variations were small, and some elements were consistently used more or less frequently for all of the courses. None of the costing elements could be discounted as unimportant, and none of the costing elements clearly dominated the others in importance.

The cost for each of these processes varies with the number of development hours required. As can be seen from Figure 1, there were some variations in multimedia elements used and in the length of development time for each. To get a better picture of costs for the development of each element, an average of the time spent on developing each element and an average of the hourly rates charged by the three production companies were used and results summarized in Figure 2.

Economic Return

Like all large corporations, Bell Canada routinely analyzes new business opportunities to determine economic attractiveness. However, this study is the first to calculate the economic return on an internal training initiative. Using classroom course delivery costs at BIPD as a baseline, the cost savings of using Web-based training were analyzed. Course development costs for Web-based training are higher than those for classroom courses, but savings result from lower delivery costs. After calculating the savings in Web-based delivery per student, the return on investment was determined as well as the number of students that must take the course before the high development costs were recovered through savings in course delivery over the client-server architecture. The case study analyzed the breakeven number of students required to recover Web-based course development costs and the return on investment over a 5-year period. All of the measures of financial performance indicated that the business case for Web-based training is strong.

The breakeven point of an investment project is the point at which either cost savings or revenue generated equals the cost of investment. Realizing savings for Web based courses requires a sufficient number of students to recover course development costs. In this case, the breakeven point is the number of students that must be trained for the fixed costs of Web-based course development to be offset by the reduced delivery costs of Web-based training. The breakeven points for the three Web-based courses in this pilot ranged from 4 to 112 students.

Return on investment (ROI) is the financial gain (or loss) that results from an investment project. The returns on investment were positive for all of the Web-based courses in the study. Returns on investment ranged from $3 saved for every $1 spent on Web-based training, to $33 saved to every $1 spent. The average savings per student was $702 for the asynchronous courses and $1,103 for the synchronous course. Of the asynchronous courses, the TCP/IP course using the Mentys learning platform had the least cost savings, at an average of $625 per student. The asynchronous frame relay course saved an average of $850 per student.

Table 4: Summary of Multimedia, Breakeven, and ROI

Course	Multimedia Development Hours	Breakeven Number of Students	ROI Over 5 Years
Routing	144 hours	4 students	3283 percent
Frame Relay	1,156 hours	51 students	697 percent
TCP/IP on WebCT	1,487 hours	111 students	288 percent
TCP/IP on Mentys	1,487 hours	112 students	283 percent

Table 5: Levels of Training Evaluation

Level 1	Reaction Evaluation: How well participants liked the training.
Level 2	Learning Evaluation: Principles, facts and techniques that were understood and absorbed by the participants.
Level 3	Transfer-of-Learning Evaluation: Transfer of training skills to knowledge on the job.
Level 4 (BIPD Goal)	Results Evaluation: Impact of training on the organization.

The most critical factor in the cost-benefit of using Web-based training was found to be the amount of multimedia content in a course. Courses with a higher amount of multimedia content, such as the TCP/IP course which contained a 5-minute video segment showed a correspondingly lower ROI. This was the only course which used video and, as a result, the number of hours spent in multimedia production was far higher than for the other courses. The synchronous course, which was the most cost effective course in the pilot, contained a few graphics and live audio only. The limited amount of multimedia content in the synchronous course offset the higher costs of course delivery which resulted from having a live instructor present during delivery, as well as greater student salary costs due to the extra hours required to deliver the course. Table 4 summarizes the number of hours spent developing each course, the resulting ROI, and the breakeven number of students.

Training Quality
BIPD is involved in the continuous improvement of training quality. To accomplish this continuous improvement, training effectiveness must have a means of being measured. Table 5 summarizes the four levels of training evaluation as defined by Kirkpatrick (1979), an industry standard for evaluating training and a system currently used at BIPD.

The evaluation of training quality is on-going in the organization. Course effectiveness is measured at "Level 1" evaluation, through student surveys about their satisfaction with the instructor, course materials, and venue. This year, BIPD intends to move to "Level 3" evaluations, in order to determine post-course effectiveness. Participants, supervisors, peers, and possibly customers will be surveyed to evaluate whether an employee's training has made a difference to his performance in the workforce. Also in the near future, BIPD will use a "Level 4" type of evaluation, where return on investment will be done for selected courses. This Level 4 evaluation will be done because of demand from senior management at Bell Canada to be informed about training effectiveness and the ROI for training.

A substantial amount of the expertise that was available within BIPD before outsourcing is still available to the organization. In fact, some former employees of BIPD now work for the training partner companies and other former BIPD employees found new jobs within Bell Canada. Quality control is an ongoing issue in the outsourcing relationship. BIPD works very closely with the training partners to ensure that standards are maintained. The use of "Level 3" evaluation techniques may help reduce some of the need for this close relationship.

The curriculum has improved since outsourcing. Outsourcing was the impetus needed to review the existing curriculum, and many courses were found to be outdated. In some cases, courses were updated, in others the courses were dropped from the curriculum. As well, some courses did not have

Table 6: Application of 6-R's to Bell Canada and General Applicability to Distance Learning

Step in Process	Aim	Bell Canada	Generalization to Other BPR Effort
I. Realization	• understanding of the need for reengineering effort to better meet the needs of the organization	• classroom training not meeting the needs of employees or the company • management and employee interest in distance learning • outsourcing has created opportunity to try new methods	• review current training strategy to evaluate opportunities for improvement • evaluate opportunities for change using internal and external resources
II. Requirements	• identification of strategic direction so BPR effort meets customer needs	• identification of employee and organizational training requirements • identification of appropriate training partner to deliver specific courses • increase use of Web-based training	• review employee and management training goals • identify new technologies or competitive business system • identify whether best met with internal or external resources
III. Rethink	• procedures, processes and technologies required are identified and put in place	• ensure that organization is structured to accommodate reengineering effort • draw on strengths in organization to take advantage of existing technologies and expertise already in place	• ensure that organization can meet reengineering effort required by evaluating organizational structure, existing technologies and processes required • identify resource gaps
IV. Redesign	• specific targets set for reengineering implementation	• reaffirm chosen technology • set goals for use of Web-based training	• plan reengineering implementation by setting targets for new methods of training design and delivery using specific technology
V. Retool	• technologies evaluated and adapted to re-engineering project	• design and delivery Web-based training pilot using several different platforms for evaluation • collect data on time and costs for course development and delivery	• design and delivery pilot of technology-based training to test feasibility • collect data necessary to evaluate pilot
VI. Reevaluate	• performance indicators measured to evaluate reengineering effort	• conduct cost-benefit analysis of pilot • evaluate alternative delivery options to ensure continuous improvement	• conduct cost-benefit analysis of pilot • evaluate alternative delivery options to identify those that best meet needs of organization

detailed written documentation and outsourcing was an opportunity to ensure that documentation was brought up to date.

CURRENT CHALLENGES

Today, the Bell Online Institute is steadily expanding the number of Web-based courses available to employees and has also been working very closely with a company that is developing a competency and training management system for Web-based course delivery. A record for each Bell Canada employee has been created and current efforts are focused on developing suggested online training curricula based on each employee's job. Links will also be made to the enterprise-wide computer system used to manage human resources, in order to track courses employees have completed. BOLI is involved in the delivery of customer projects generated by the sales and marketing staff of Bell Learning Solutions as well. The number of permanent staff assigned to BOLI

has been increased and there has also been an increase in the number of outside consultants brought in to work on customer projects. The current challenge to BOLI is to remain focused on projects that will add the greatest value to the organization, as well as effectively manage the many projects that are now underway.

CONCLUSION

The Bell Online Institute pilot project is a reengineering effort that illustrates some of the general principles for reengineering classroom training to distance learning:

- the need for business process reengineering was defined at the Realization stage
- customer requirements were established in the Requirements phase and both employees and senior management supported the proposed changes
- appropriate technologies were integrated into the new business process in the Rethink phase
- the reengineering project had clear goals for performance improvement set in the Redesign stage
- the change was carefully managed at the Retool stage by carrying out a pilot project to test the feasibility of the solution, and
- there was an evaluation of the new process based on clear performance measurements during Reevaluation.

Table 6 summarizes the 6-R's, Bell Canada's reengineering of training, along with generalization to other reengineering efforts in the area of corporate training. The 6-R's methodology was effectively applied to the case of distance training at Bell Canada and could be generally applied to business process reengineering efforts for training in other organizations.

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APPENDIX: Glossary

Asynchronous: network communication which is not done in real time; for example, e-mail or the use of HTML pages.

Audiographic Conferencing: real-time audio and graphics-only (using a device such as a White Board) among groups of people, often in specially equipped rooms.

Breakeven Point: the number of students that must be trained for the fixed costs of Web-based course development to be offset by the reduced delivery costs of Web-based training. Breakeven = (Fixed Costs of Web-Based Course - Fixed Costs of Classroom Course) / (Delivery Cost Per Student for Classroom Course - Delivery Cost Per Student for Web-Based Course).

Browser: a computer program, such as Netscape, which allows users to access and view documents on the Web.

CD-ROM (Compact Disk Read Only Memory): a plastic disk coated with aluminum which stores information digitally as non-reflective pits or bubbles. A 5.25 in CD-ROM is capable of holding about 650 Mbytes of information.

Client: an end-user computer using a browser program (such as Netscape) to receive multimedia documents from a Web server.

HTML (Hypertext Markup Language): the standard document format used on the Web.

Internet: an international network linking millions of computers via telephone lines using the TCP/IP protocol. .

Intranet: an internal network linking corporate computers using the TCP/IP protocol.

Multimedia: any combination of text, graphics, images, audio, and video which have been digitally encoded.

Return on Investment (ROI): the financial gain (or loss) resulting from the use of Web-based training. ROI = (Present Value of Savings From Web-Based Training / Present Value of Costs of Web-Based Training) * 100.

Server: an Internet host computer using a program (such as NCSA's HTTPD) to store and transmit multimedia documents for an information service (such as the World Wide Web).

Synchronous Communication: real-time network communication such as video conferencing.

TCP/IP (Transmission Control Protocol/Internet Protocol): Protocol which enables universal interconnection and addressing of all Internet hosts.

Video Conferencing: real-time audio and video between groups, often in specially equipped rooms.

Web: a network of multimedia documents stored on Internet or intranet servers, which can be seen by using a browser. Documents are formatted with the HTML standard and transmitted with the HTTP standard.

White Board: a shared electronic drawing board which can be displayed on each workstation.

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