CHAPTER 1

THE UCLA BUSINESS AND INFORMATION TECHNOLOGIES (BIT) SURVEY — YEAR 2

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Summary

The UCLA Business and Information Technologies (BIT) Survey is aimed at understanding and tracking the impacts of technologies on business practices. This report presents the results of the second survey conducted in the US in 2004–2005.

The subject group of the survey consisted of organizations and sub organizations that make independent decisions with respect to the acquisition, implementation and the use of new technologies. The survey was sent to chief information officers and senior information systems managers as these individuals are most likely to be able to respond to the survey.

The survey addressed a wide range of business practices, including technology adoption, internal organization transformations, market facing activity, supplier and vendor relationships, and business results and performance consequences from the application of new technologies. Globalization and outsourcing/offshoring were also included.

The survey results indicate that businesses are changing internally as well as in terms of their interactions with their customers and trading partners. As might be expected, the rate of change is perhaps not as rapid as might be suggested by the "high water mark" examples which are described in the popular business press. However, the changes are without question both pervasive and on-going.

Some of the key results of the survey were as follows:

- The internal organization of companies is changing significantly in terms of both structure and workforce. Organizations are becoming flatter, with a wider span of control, more geographically distributed, and more "virtual". Teleconferencingtele-conferencing is increasing, telecommuting is not as widely accepted.
- The workplace and work requirements are changing. Many employees face screens, many are being monitored for performance. Technical capabilities are becoming necessary. Executives are asking for more and better structured information.
- The degree to which outsourcing and off shoring are being pursued is still limited. IT services, payroll and market research continue to be the more widely outsourced business functions. Outsourcing is not considered to be causing workforce reductions.

- The technologies and systems that are the most widely adopted are wireless hardware and software and e-commerce tools and websites.
- Radio frequency identification (RFID) and identity management solutions are not being widely adopted at this time. However, many firms plan to purchase them in the near future, indicating that the interest in security is going up.
- Organizations are using multiple touch points for customer relationship management (CRM). These include online, mail, face-to-face and phone.
- Companies are collecting more data with online technologies. However, the use of this data for customer view integration is not as prevalent for marketing yet.
- The adoption of on-line sales has not as yet had a major impact on marketing strategy. In particular, there has not been a significant change in branding or positioning (across all respondents). However, there is substantial interest in having customers perform more self-service tasks while purchasing online.
- Technology adoption has caused internal communication costs and production costs to decrease. However, the costs of technology acquisition and implementation, and of consultancy and collaboration have predictably increased.

The most striking outcome of the survey is perhaps the organizational impact. It is clear that work life at the level of the individual, as well as firmwide organizational structures are changing. It is also clear that certain technologies and capabilities have been very widely adopted, e-commerce and active websites for internal and external communications are the most widespread. At the same time, there are some rather negative results: organizations do not say that they have expanded their reach on the market side very dramatically. The adoption of hardware-based technologies such as biometry and RFID appears to be slower than the software and communications side.

We note that since the survey is across all industry sectors, some finer analysis may reveal important local differences. This work is under way. In addition, the firm level surveys do not easily reveal sector level changes. Industry and sector studies that are being conducted by us and our research partners will help to understand those issues better.

This is the second survey in a series of surveys to understand the impacts of technologies on business practices. By comparing the results for the two years, we find that most patterns continue to remain the same. This shows the validity of the survey findings. Some trends that are emerging include the following:

- Some technologies that are beginning to emerge as the technologies for the future include wireless software and hardware, RFID and collaboration portal tools. ERP also continues to be popular for deployment in the near term.
- Continued investment of technology budgets into security hardware and software is observed. Although off shoring/business process outsourcing continues to be lower in the list of company technology budgets, it is seen to have an increasing trend.
- Outsourcing of IT services is increasing. Outsourcing is also not seen as the reason for reduction in jobs.
- The trend is towards the automation of all CRM functions. Partner relationship functions are also becoming more automated as supported by the strong increase in the adoption of e-payments and e-procurement.

- Technology is seen to be helping organizations understand their customers better in all strategic areas. However, although more data is collected with automation, businesses are not yet integrating the customer view significantly.
- Globalization is not seen to a great extent. However, the trend is towards increasing globalization to the Asian regions.

1.1. Introduction

1.1.1. *The BIT project*

Notwithstanding reports to the contrary, the information economy is alive and well. The study by Apte and Nath (forthcoming 2006) which follows earlier work by Machlup (1962,1982) and Porat (1977), puts the size of the information sector at about 55% of the value added to the GNP of the US in 1992. That was before the boom in online technologies and the web. Even a conservative extrapolation of the results of these studies would put the information sector at over 60% of the GNP today and is growing steadily. In short, it is the major part of the economy already, and will dominate it for the foreseeable future. The US can truly be called an information economy today.

The intent of the Business and Information Technologies (BIT) project is to study the impact of new information technologies on business and industry structure. The internet phenomenon was primarily a matter of a fundamental change in information logistics, with the protocols of the web superimposed on a deregulating and increasingly competitive telecommunications environment. This story continues to play itself out.

However, there are new technologies and systems on the horizon, and it is likely that a second slower wave of change based on infrastructure development, and then probably a third wave based on information processing, intelligent agents, and natural interfaces (as distinct from just the shipping and handling of information) will be observed. It is expected that all these technological and infrastructure developments will change the structure of firms in terms of organization and work process, will change information chains and inter-organizational relationships, and alter the structure of industrial sectors, to the point that the traditional categories do not apply very well.

One very basic change is occurring in the nature of the workplace. Most workers now face a screen for some significant period of time during work hours. The screen is a very different workplace from a desktop, since it is much better connected with places, people and processes outside the workplace. The screen (or interface) is also easily liberated physically from the desk and cubicle. It is apparent that the traditional notion of contemporaneous colocation as the core of an organization is ready to disappear.

However, it is not clear how and when this will happen, or what will take its place. It is also not clear how lines of authority, responsibility and communication will be established in the new firm. Perhaps, the concepts of span of control and hierarchy will disappear in favor of some form of "just-in-time" and "only-on-demand" management.

The dot.com boom might have come and gone, but it has permanently changed the face of B2C relationships well beyond just the new phraseology. There is no question that sectors like retailing, travel services, and financial services have been transformed, not just in terms of new entrants, but for the incumbents as well. For many consumer goods and services, the web is now a growing carrier of brand equity and customer recognition; it has become a new face for a company. The changes in the B2C layer are beginning to ripple back into supply and service chains. The impact on logistics, freight and delivery services is most easily seen, but many other equally dramatic changes are occurring inside and between firms, which are invisible to the casual observer.

The reduction in the costs of information logistics suggests obvious changes in business practice. As transaction costs drop, as large volumes of information can be reliably and quickly transported, there will be changes in the structure of business processes that exploit these advantages. Some of the consequences of B2B interactions have already been observed, although hype and overestimation have tended to distract from the very significant reality.

Perhaps, the most important issue today is the overall impact of these technologies on the structure of industry sectors and the economy as a whole. Many sectors are coalescing and converging. For example, newspapers, magazines, and broadcast organizations are all colliding on the web. Those sectors will fragment and reform into new alignments, which exploit their core strengths. The position that newspapers have held because of the economics of delivering information bundles to the door, is seriously threatened by online channels. For example, newspapers are not now or in the future, the strongest suppliers of "breaking" news, especially in multimedia formats. The television networks have the best collection and packaging systems for that task. Newspapers may hold on to criticism, commentary and review, though magazines could easily start to compete for that role. In turn, TV broadcasts will face challenges from web casts. Magazines will have to contend with web-based competitors, and go on the web themselves. Of course, these changes will not occur overnight. For a time, most media and publishing companies will have to think in terms of both sheets and screens.

There are very similar stories, which can be told about other sectors, as well as about international trade. The point is that these changes are huge, and deserve to be followed closely. It is relatively easy to make broad brush comments about the changes that are underway, as we have above. However, hard information about the extent and distribution of these effects is lacking.

The BIT study documents the information technology driven changes that are occurring in business structure, business practice and sector structures across a wide spectrum of industry sectors in the US and the rest of the world. The first step in the process is to do a base line study, which establishes the state of this universe. Subsequently, the study will be repeated at appropriate time intervals to track the

changes that are actually occurring, so as to provide hard information on what is really happening across the economic landscape as a result of changes in information technologies. The study will encompass several sectors.

The BIT project is being conducted on a global scale. At the time of writing, the project had 13 partners from leading academic and research institutions around the world. The partners include Italy, India, Chile, Korea, Argentina, Greece, Spain, Taiwan, Peru, New Zealand, France, Sweden, Germany, and USA. The details of the BIT partners are in Appendix C.

Five of these teams (Italy, India, Korea, Spain, and USA) have conducted surveys in 2004–2005. It is expected that the BIT survey will eventually be conducted in, perhaps, 15–20 countries by research teams from those countries. This global perspective combined with the longitudinal view will provide a unique and comparative picture of technology and business practice across the world.

The potential for learning across these groups is vast. The nature of best practices in different countries varies widely. Nor are the most developed countries always the most advanced in technology use and penetration. For example, many countries are far ahead of the US in the degree of conversion to electronic banking and monetary systems. As an example, certain European countries have already closed their check processing facilities, since checks have almost passed out of use. India surpasses many countries in the extent of software project involvement and exports, despite a miniscule level of penetration of PC use or for that matter, phone usage. In many eastern countries, the use of wireless communications, is rapidly outstripping traditional wireline systems. It is expected that several interesting local variations in business practices will be found.

This project is complementary to the world internet project (WIP) originally centered at UCLA, and now at the Annenberg Institute of USC. That study consists of a panel survey of individuals, also conducted in parallel in multiple countries. The differences here are that we do not do a panel survey, the subject of our study is the organization (or a subset), and the survey can only be the starting point for deeper investigations of several industry sectors. Nonetheless, the WIP study was a model and catalyst for this project. Professor Jeff Cole, the research director and originator of WIP, has commented that a study like WIP should have been done for television in 1940, but never was. We would paraphrase that comment and say that a study like BIT might have been done to document the impact of the printing press, the telephone, the typewriter and the computer, on business organizations, but never was. Nevertheless, today we have the opportunity to do these studies as today's new technologies change both, the social and the work environments, as well as the larger economic picture in terms of industry sector structure, employment, and trade.

This report summarizes the results from the second BIT survey conducted in the US in 2004–2005 (the first US survey was conducted in 2003–2004). The hypotheses and the results are discussed in the following sections. The methodology used is described in

Appendix A. As we have mentioned, in addition to the survey itself, the BIT project also includes in depth studies of industry sectors and information chains, as well as studies of the changes occurring in the overall economy with respect to GNP, employment, and trade. These are reported elsewhere.

1.2. The Survey

The survey instrument was developed in close collaboration with our research partners in Italy and India. The lead investigators and collaborators from those teams were Professor Andreina Mandelli (SDA Bocconi, Milano), Professor Cinzia Parolini (SDA Bocconi, now at the University of Modena) and Professor Atanu Ghosh (SMSOM, IITB, Mumbai).

In developing the questionnaire, we first identified the most important and interesting issues which we hoped to investigate. We then framed the issues in terms of specific hypotheses capable of being supported or refuted by a survey. The hypotheses were then used to generate questions for the survey. The same survey instrument has been used for both years so that findings can be compared. The major issues and their relationship to questions in the survey are summarized below.

1.2.1. *Technology adoption/infrastructure and budget trends*

Question 1 — What technologies are organizations using currently or planning to use in the near future? What technologies are organizations not using and not planning to use in the future?

Question 2 — What technologies have organizations invested in (and not invested in) over the last three years?

1.2.2. *Organizational structure and workforce transformations*

Question 3 — How are organizations changing internally in terms of their workforce?

Question 4 — How are organizations changing internally in terms of their structure?

Question 5 — Are organizations outsourcing some of their business processes? Is business process outsourcing (BPO) more popular for certain functions in the organization such as accounting, marketing, IT and finance?

Questions 6 & 7 — What is the outsourcing budget for organizations for IT and nonIT functions? How much of the total outsourced business is offshore?

1.2.3. *Customer facing (CRM) interactions*

Question 8 — Are relationships with customers developed and maintained using multiple touch points? What are the most popular touch points?

Questions 9 & *14* — How is customer view integrated using certain technologies? What mechanisms are used by organizations to perform customer segmentation?

Questions 10, 11 & *12* — Are promotion and advertising budgets shifting towards online channels? Which online advertising methods have been adopted by organizations? In going online, are organizations creating a new face in terms of branding concept, slogan, logo and name?

Question 13 — For which functions is customer relationship management (CRM) becoming automated?

Questions 15 & *16* — Is the number of organizations selling products and services online increasing? How is online business different from traditional business?

1.2.4. *Trading partner (SCM) relationships*

Question 17 — What technologies are organizations using for communicating with their trading partners?

Question 18 — What IT-based channels and B2B mechanisms are organizations using for purchasing?

1.2.5. *Business results*

Questions 19 & *20* — What economic and operational business results are being impacted by technologies? What strategic areas are being impacted by information technologies?

1.2.6. *Globalization*

Questions 21 & *22* — Are organizations becoming more global? Is the geographic reach of organizations increasing?

1.3. Results

The survey was sent to senior information systems managers. The methodology is described in Appendix A. About 250 responses were received. The details of the sample are discussed in Appendix B. The results obtained by analyzing these responses are discussed below.

1.3.1. *Technology adoption/infrastructure and budget trends*

- Wireless hardware/software and websites/e-commerce technologies are the most deployed technologies.

- Radio frequency identification (RFID) and identity management solutions are not as widely adopted by organizations at this time. However, many plan to purchase them over the next few years.
- Budgets for security software and hardware and wireless technologies have increased. Budgets for offshore outsourcing/BPO and on-demand computing have not increased as much.

1.3.2. *Internal organization: workforce and structure trends*

- The demand for IT at all levels in the organization ranging from executive decision-making tools to skilled lower level staff and collaborative tools is increasing. The proportion of employees facing a screen is up as is the need for constant employee retraining.
- Outsourcing is not considered to be causing workforce reductions.
- Organizations are changing to hierarchies with flatter structures, fewer levels of control, and fewer middle level managers. Organizations are becoming geographically dispersed. Teleconferencingteleconferencing is on the rise although telecommuting is not as widely accepted.
- More organizations are monitoring the productivity of customer facing employees and are employing automated monitoring of workforce productivity. However, compensation is not based on these observations.

1.3.3. *Internal organization — offshoring BPO*

- IT programming, payroll and market research are the most outsourced business functions and processes. RFP bids and contract management, accounting, finance and order fulfillment are the least outsourced business functions.
- A slightly greater proportion of organizations outsource their IT functions compared to their nonIT functions.
- Organizations are beginning to offshore more of their business processes although the proportion of organizations currently reporting offshoring/BPO is still small.

1.3.4. *Customer touch points*

- Organizations use multiple touch points for CRM. Phone, e-mail, face-to-face, website — brochure ware and regular mail are the most used touch points, screen pops and phone text messaging are the least used.

1.3.5. *Customer view integration and customer segmentation*

- Customer view integration and segmentation of customers are currently employed by a small number of organizations. Statistical data mining, data marts/warehouses and demand forecasting are the most popular tools for customer view integration.

- For organizations segmenting their customers, segmentation by geography and use of portals are most popular.

1.3.6. *Online advertising and selling*

- Incentives in printed materials to drive customers to the company website is the most widely used online advertising mechanism. Advertisements or links on other websites to drive traffic to the company website, advertisements or links on search engines to drive traffic to the company website and web banners are other popular online advertising methods.
- Some organizations have changed their online image in terms of the branding concept, logo and slogan. Changing the name of the organization in going online is not as popular.
- Organizations have invested and plan to continue to invest in online advertising over the next few years. However, the organizations that are investing a lower percentage in online advertising plan to cut down their budgets slightly, while organizations that are investing a higher percentage in online advertising plan to increase their budgets over the next few years.

1.3.7. *CRM function automation*

- The most automated CRM functions include help desk, order placement, order tracking/fulfillment, and content management for websites. Sales calls automation is the least automated CRM function.

1.3.8. *Traditional versus online selling*

- Most organizations have traditional and online presence. No organization reported having only an online presence.
- The number of self-service tasks performed by customers and the data collected are higher for online selling, sales volumes and the number of products/services offered are higher in traditional selling.

1.3.9. *Trading partners relationships and purchasing mechanisms*

- Web-enabled communications, electronic data interchange (EDI), e-payments, and XML are currently the most popular communication technologies used among trading partners.
- Web-enabled communication, XML, e-procurements, and e-payments are the technologies of choice for future deployment in the next three years.
- Direct purchasing, long-term purchasing contracts and catalogues are the most used B2B mechanisms for purchasing; hubs and aggregators are the least used.

1.3.10. *Business results*

- Internal communication costs and production costs have decreased with technology adoption. Technology costs, and consultancy and collaboration costs have increased.
- Technology has increased the understanding of customer behavior in all strategic areas.

1.3.11. *Globalization*

- Organizations are increasing their geographic reach in terms of trade with other countries, the number of their production or service delivery bases in other countries and the number of countries in their supplier base.
- Organizations currently have or plan to have operations in Canada and Mexico (NAFTA), Western Europe and Latin America. Increasing globalization is observed in SE, East and South Asia as well as in Central and Eastern Europe. Increasing globalization in Asia and Central and Eastern Europe is expected over the next few years.

1.3.12. *Technology adoption/infrastructure and budget trends*

Question 1 — What technologies are organizations using currently or planning to use in the near future? What technologies are organizations not using currently (and not planning to use in the future)?

An overwhelmingly large number of organizations (94.8 and 93.1%) have deployed/plan to deploy wireless hardware/software and websites/e-commerce technologies. 79.4% have/plan to have collaboration and portal tools, 78.2% have/plan to have groupware and productivity tools such as Lotus Notes, 71% have/plan to have enterprise resource planning (ERP) and 66% have/plan to have surveillance tools. Among these technologies, collaboration/portal tools and ERP are on company budgets (about 25%) as the most popular technologies for adoption in the next few years.

RFID is currently adopted only by a very small percentage of organizations (10.5%). However, three times as many organizations (30.2%) plan to purchase the technology in the next three years. Similarly, identity management solutions are currently deployed by 19.8% of the organizations, but 30.2% plan to deploy them in the next few years. Business process modeling and business intelligence are also on the lists of about a quarter of the companies as planned purchases in the next few years.

These trends are shown in Fig. 1.1.

Codes for the trends are as follows:

1. Enterprise application integration (EAI) and middleware
2. Storage area networks (SAN) and network attached storage (NAS)
3. Operating system — Linux

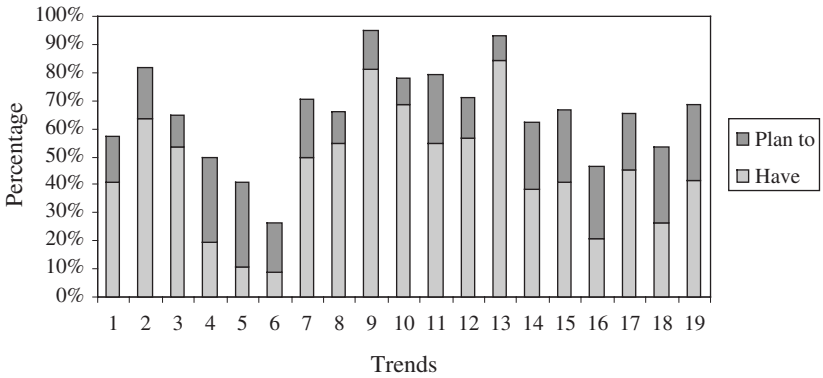

Fig. 1.1. Technology trends.

4. Identity management solutions
5. Radio frequency identification (RFID)
6. Biometrics
7. Third party authentication and verification
8. Surveillance systems
9. Wireless network connectivity hardware and software
10. Groupware/productivity tools
11. Collaboration & portal tools
12. Enterprise resource planning (ERP)
13. Website and e-commerce
14. Business intelligence
15. Business process modeling
16. E-learning
17. Enterprise instant messaging (IM)
18. Supply chain management (SCM)
19. Content management

Question 2 — What technologies have organizations invested in (and not invested in) over the past three years?

Security software (increased or increased significantly in 76.2% of the organizations) and security hardware (increased or increased significantly in 67.3% of the organizations) top the list of technologies organizations have invested in over the past three years. Wireless hardware and software (67.3%), software applications (62.1%), infrastructure (61.7%) and hardware storage (60.5%) budgets have also increased.

On the other hand, budgets for offshore outsourcing/BPO and on-demand computing (18.2 and 17.3%, respectively) have increased little in the past three years. These trends are shown in Fig. 1.2.

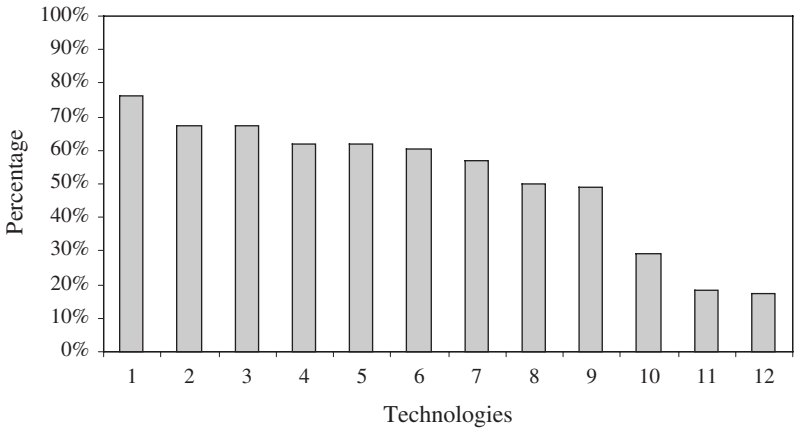

Fig. 1.2. Budget trends.

Codes for the trends are as follows:

1. Software: security
2. Hardware: security
3. Wireless hardware & software
4. Software: applications
5. Infrastructure
6. Hardware: storage
7. Disaster recovery & business continuity since 9/11
8. Intranets and extranets
9. Software: operating systems & networking
10. Service contracts ASP co-location application integration etc.
11. Business process outsourcing/offshoring
12. On-demand computing

1.3.13. *Internal organization*

Question 3 — How are organizations changing internally in terms of their workforce and the workplace?

The workforce is changing. The demand for decision support tools at executive levels is increasing tremendously. The proportion of employees facing a screen is increasing and workers need to retrain constantly. Teleconferencingteleconferencing is on the rise, workers are collaborating and the need for IT skills at lower levels is going up. However, telecommuting is not yet as widely accepted by organizations.

Outsourcing is not felt to be the leading to workforce reductions in organizations although and the role of automation in workforce reductions is not supported clearly one way or the other.

These trends are shown in Fig. 1.3 below.

Codes for the trends are as follows:

1. More employees are telecommuting
2. The use of teleconferencingteleconferencing is on the rise
3. The proportion of employees facing a screen is increasing
4. Automation of functions is leading to workforce reductions
5. Outsourcing is leading to workforce reductions
6. The need for IT skills at lower levels is going up
7. Collaboration between workers from the use of internet-based collaboration tools (such as net meeting) is increasing
8. Workers need to retrain constantly to keep up with changing technologies
9. The demand for intelligence in information at executive levels is increasing
10. The number of middle level managers is decreasing
11. The IT function is shifting from staff to line

Question 4 — How are organizations changing internally in terms of their structure?

The most significant trend is the increasing availability of new decision-making and online technologies, as reported by more than three-quarter (77.0%) of the organizations.

Organizations are becoming flatter, the number of direct reports to a manager is increasing and organizations are becoming geographically dispersed with direct reports to a manager not located at the same location as the manager.

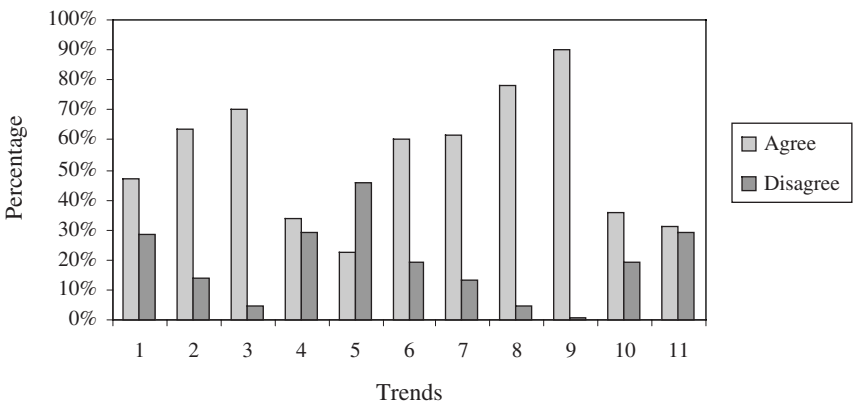

Fig. 1.3. Internal organization.

Although the number of organizations monitoring customer facing interactions is increasing, as is the number of organizations monitoring workforce productivity, incentives are currently not based on their productivity.

These trends are shown in Fig. 1.4 below.

Codes for the trends are as follows:

1. The span of control for most of the managers is widening (the number of direct reports to managers increasing)
2. The organization is becoming flatter (fewer levels in the organization chart)
3. The monitoring of customer-facing interactions is increasing (e.g. phone calls from/to customers)
4. Automated monitoring of workforce productivity is increasing.
5. Incentives are based on monitoring of productivity
6. The organization is becoming more geographically dispersed (e.g. direct reports to a manager located at different locations)
7. New decision-making tools and online technologies are increasingly becoming available.

Question 5 — Are organizations outsourcing some of their business processes? Is BPO more popular for certain functions in the organization such as accounting, marketing, IT, and finance?

The most often outsourced business processes are IT programming, payroll and market research. IT programming is outsourced (plan to outsource/significantly outsourced/partially outsourced) by 52.4% of the organizations, payroll by 46.4%, and market research by 44.4% of the organizations. RFP bids and contract management, accounting, finance and order fulfilment are not outsourced with 88.7, 87.7, 86.3,

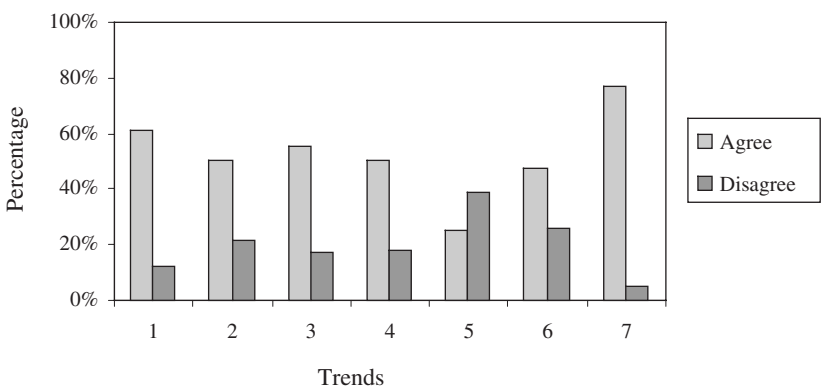

Fig. 1.4. Internal organization structure.

and 85.1%, respectively of the organizations not currently outsourcing these business processes.

These are shown in Fig. 1.5 below.

Codes for the business functions are as follows:

1. IT Functions: programming
2. IT Functions: data center operations
3. IT Functions: network management
4. IT Functions: data management
5. Customer contact
6. Payroll
7. Market research
8. Accounting
9. Finance
10. Order fulfillment
11. RFP bids and contract management

Questions 6 & *7* — What is the outsourcing budget for organizations for IT and nonIT functions? How much of the total outsourced business is offshore?

The trends for outsourcing of IT and nonIT functions were measured as a percentage of the total sales revenue and are shown in Fig. 1.6. Almost one-third of the organizations (30.2%) outsource up to 1% of their IT functions and about one-fifth (21.8%) outsource up to 1% of their nonIT functions. Up to 5% of IT and nonIT functions are outsourced by 11 and 13.3% of the organizations.

These results are based on a smaller sample as close to half of the organizations did not respond or felt that it did not apply to them. This may also be interpreted that a large percentage of the organizations do not currently outsource or do not wish to talk about it.

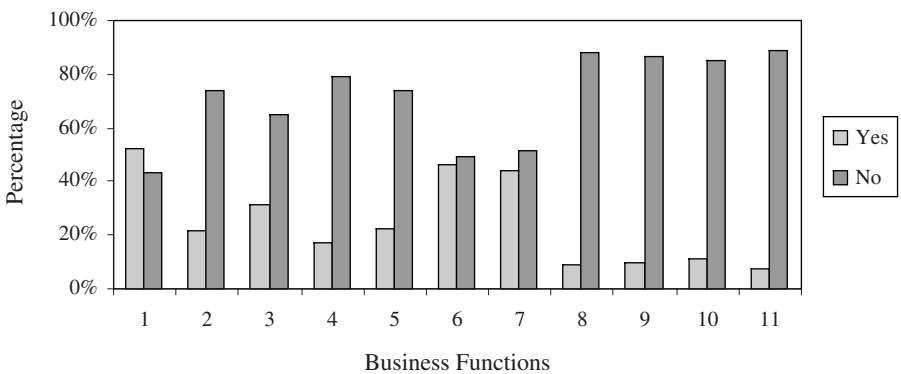

Fig. 1.5. Internal organization BPO.

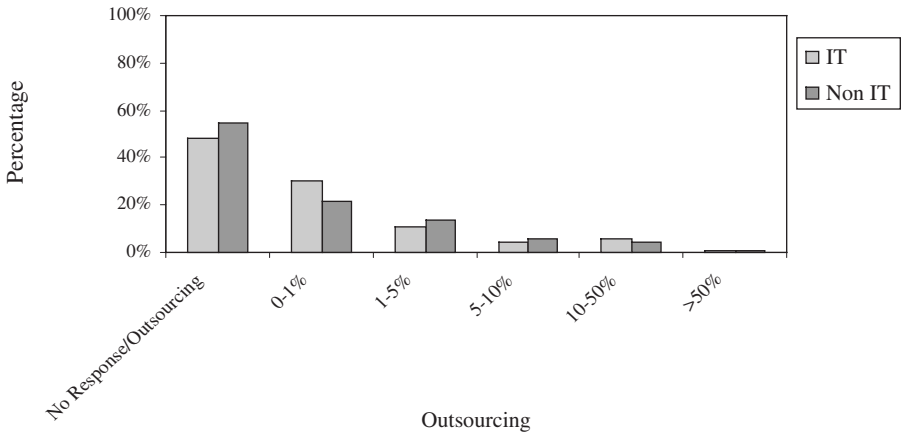

Fig. 1.6. Outsourcing as a percentage of sales revenue.

The survey instrument also contained a question on offshore outsourcing. Although a large percentage of the organizations did not respond, based on the ones that did respond, offshoring comprises 0–1% of the outsourcing budget for about 7% of the organizations and 10–50% of the outsourcing budget for about 6% of the organizations. These are shown in Fig. 1.7. This may indicate that offshoring is increasing dramatically in certain types of organizations and is still minimal for others.

1.3.14. *Customer facing interactions*

Question 8 — Are relationships with customers developed and maintained using multiple touch points? What are the most popular touch points?

Multiple touch points are used by organizations to interact with their customers. Phone (11.3%), email (11.2%), face-to-face (10.9%), company website — brochureware (10.4%) and regular mail (10.2%) are the most frequently used touch points. Screen

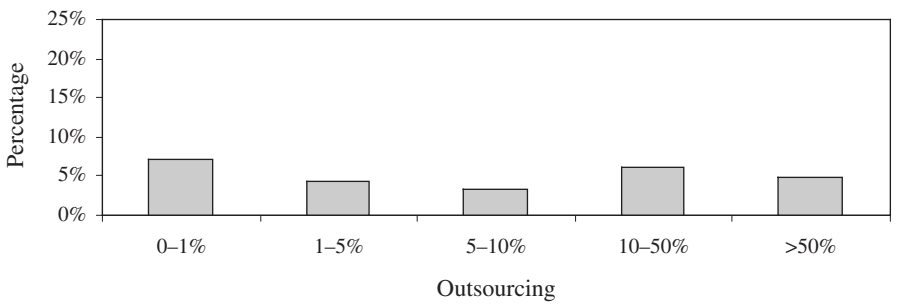

Fig. 1.7. Outsourced business that in BPO.

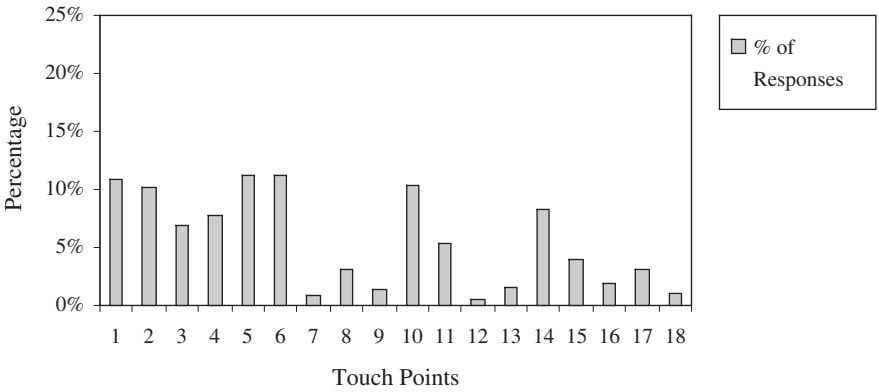

Fig. 1.8. Customer touch points.

pops (0.5%) and phone text messaging (0.9%) are the least used touch points by organizations. Refer to Fig. 1.8.

Codes for the touch points are as follows:

1. Face-to-face contact
2. Regular mail
3. Referrals
4. Fax
5. Email
6. Phone
7. Phone Text Messaging
8. Phone — Automated Interactive Voice Response (IVR)
9. Phone — computer telephony integration (CTI)
10. Company website — brochure ware
11. Company website — transactional including paying bills, online receipts, etc.
12. Screen pop
13. Online intermediary or third party
14. Printers/Flyers/Catalog
15. Radio
16. Kiosk
17. Extranet
18. Other

Questions 9 & *14* — How are customer views integrated into the organization using certain technologies? What mechanisms are used by organizations to perform customer segmentation?

Various technologies are used to integrate customer views into the organization.

Data mining/statistics is used by 16.3%, data marts/data warehouses by 15%, demand forecasting by 15%, and customer profiling by 13.8%.

Text mining (1%) and data mining with neural networks (1.9%) are the least used technologies for customer view integration.

These trends are shown in Fig. 1.9 below.

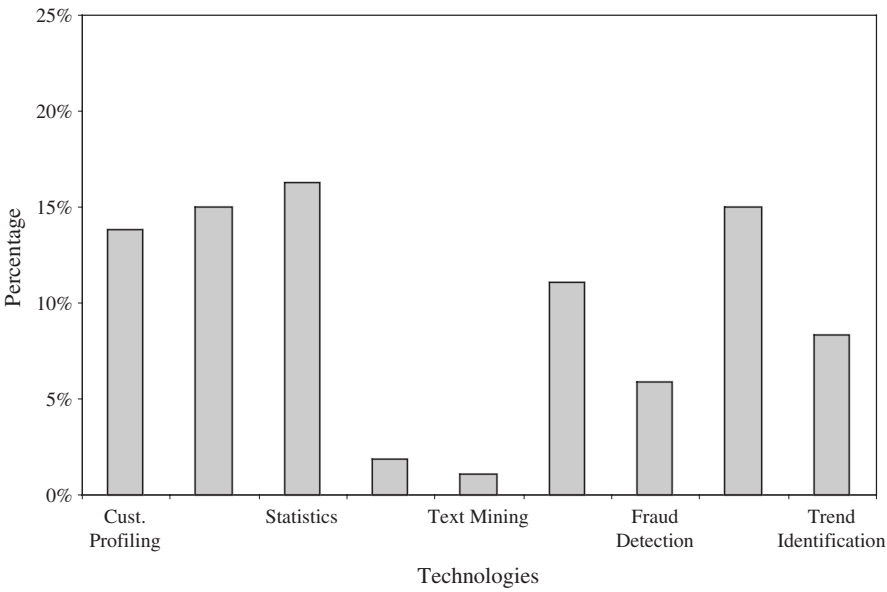

Fig. 1.9. Technologies for customer data analysis.

About a quarter (22.5%) of the organizations segment customers by geography and 16.3% use portals for segmenting their customers. The least used methods for customer segmentation are automated crossselling (e.g. using ATMs for banks) (2.2%) and developed user communities — in terms of channel management (5.4%).

These are shown in Fig. 1.10.

Codes for the mechanisms are as follows:

1. Personalize website by customer
2. Customized pricing
3. Geography
4. Access to online technology
5. Portals for customers
6. Developed user communities (in terms of channel management)
7. Automated cross-selling
8. Market Segment
9. Credit Scoring/previous history

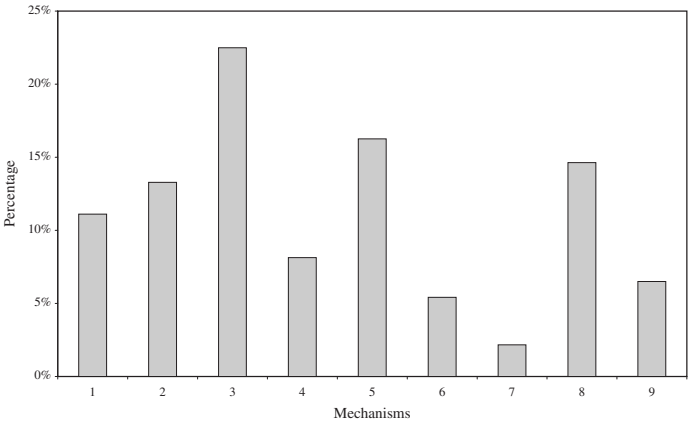

Fig. 1.10. Mechanisms for customer segmentation.

Questions 10, 11 & *12* — Which online advertising methods have been adopted by organizations? Are organizations getting a new face in terms of branding concept, slogan, logo and name in going online? Are promotion and advertising budgets shifting towards online channels?

Organizations use various channels for online advertising. Incentives in printed material to drive customers to the company website are used by about a fifth (19.5%) of the organizations, advertisements or links on other websites to drive traffic to the company website are used by 15.4% of the organizations, advertisements or placement in search engines to drive traffic to the company website are used by 11.8% of the respondents and web banners are used by 8.5%. These and other trends are shown in Fig. 1.11 below.

Codes for the mechanisms are as follows:

1. Personalize website by customer
2. Customized pricing

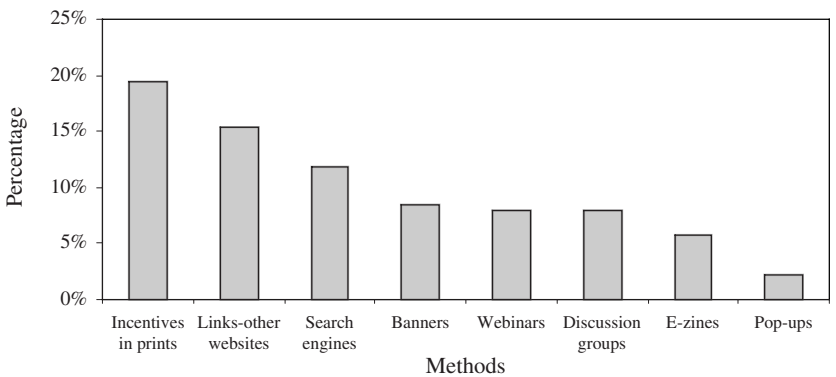

Fig. 1.11. Online advertising methods.

3. Geography
4. Access to online technology
5. Portals for customers
6. Developed user communities (in terms of channel management)
7. Automatic crossselling
8. Market segment
9. Credit scoring/previous history

About a tenth of the respondents invest 1–5% of their advertising budgets in online advertising with the percentage of organizations expected to decrease from 2002 to 2005. However, the number of organizations investing 10–50% of their advertising budgets in online advertising is expected to increase from 2002 to 2005. These trends are shown in Fig. 1.12 below.

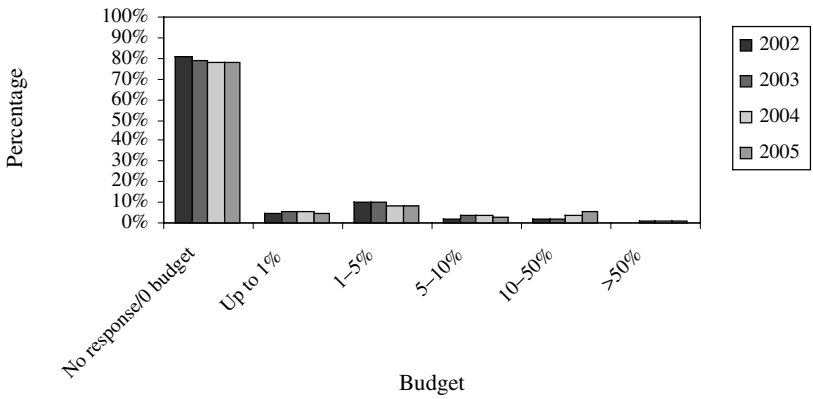

Fig. 1.12. Online advertising budgets as a percentage of annual advertising budget.

Less than a quarter of the organizations have changed their online image in terms of their slogan (23%), logo (23%) and branding concept (22.2%). Only a few organizations (8.1%) have changed their names, as shown in Fig. 1.13.

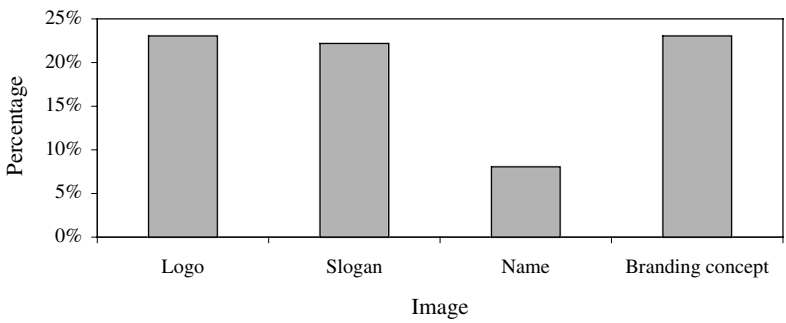

Fig. 1.13. Change of image in going online.

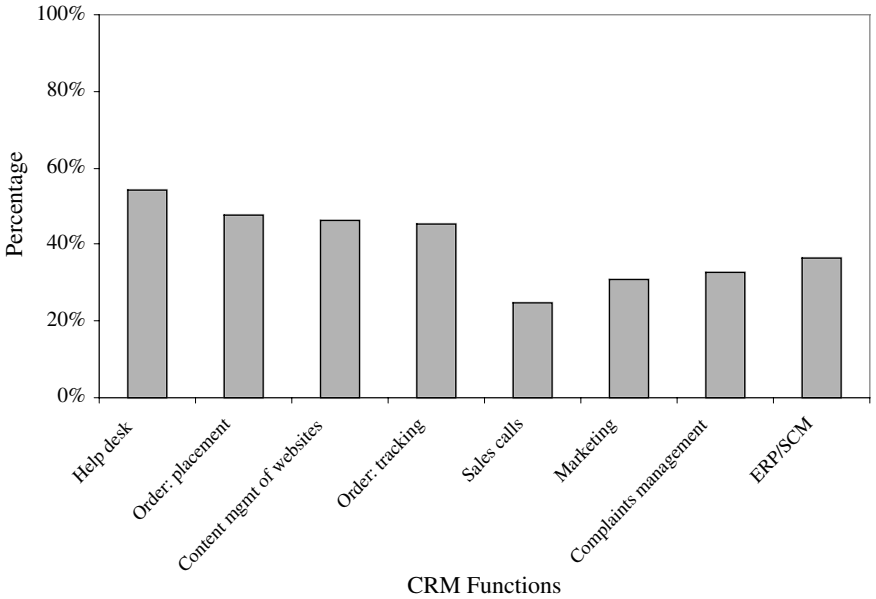

Fig. 1.14. Automation of CRM functions.

Question 13 — Which CRM functions have been automated?

Automated (either partially or completely) CRM functions include help desk, order placement, order tracking and fulfillment and, content management for websites. Sales calls and customer complaints management are the CRM functions that have been automated the least. As shown in Fig. 1.14, 54% of the organizations have automated help desk, 47.6% have automated order placement, 46.4% have automated content management for websites, and 45.6% have automated order fulfillment and tracking. Only about a quarter of the organizations have automated their sales calls (24.6%) function, 31% have automated their marketing and a third (33.7) have automated customer complaints management (Fig. 1.14).

Questions 15 & *16* — Are the number of organizations selling products and services online increasing? How is online business different from traditional business?

Close to half of the organizations (46.7%) offer Traditional as well as Online services and products, about 36% have traditional stores. No organizations reported having only online presence. These are shown in Figure 1.15.

Online business is compared with traditional business using several factors. Among these, sales volume, cost of products, products/services offered, data collected, and self-service tasks performed by customers are found to be different between online and traditional businesses. Figure 1.16 shows these differences. Lower and significantly lower responses are combined under the category of lower for online, higher and significantly higher responses are shown under higher for online. As shown in the

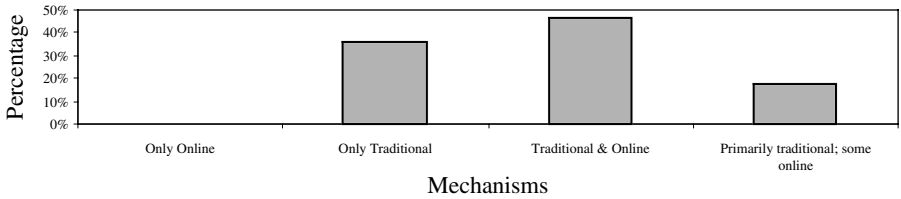

Fig. 1.15. Mechanisms used to sell products and service.

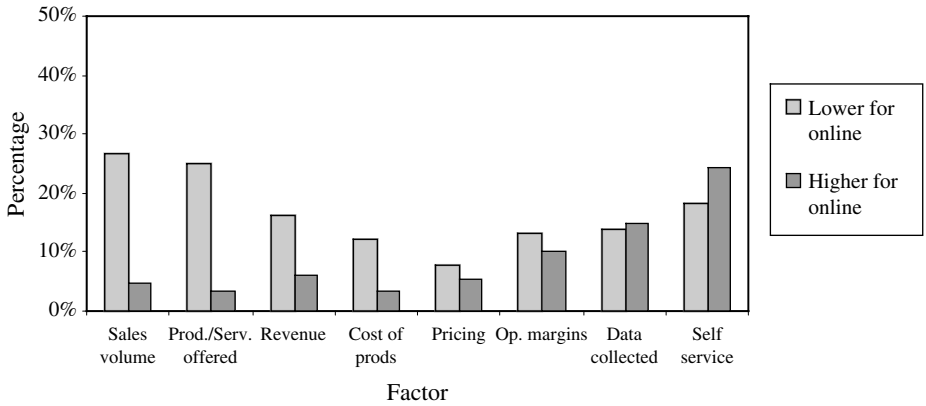

Fig. 1.16. Online versus traditional.

figure, online sales volumes are lower than traditional sales volumes for almost one-quarter (26.6%) of the organizations, and products/services offered are lower for online for 25% of the organizations. The number of self-service tasks performed by customers and the data collected are higher for online for 24.2 and 14.9% of the organizations, respectively.

1.3.15. *Trading partner relationships*

Question 17 — What application technologies are organizations using for communicating with their trading partners?

The most popular technology applications for communicating with trading partners (have or plan to have the application) used by organizations include web-enabled communications (48.8%), electronic data interchange (EDI) (44.8%), e-payment, (42.7%) and XML (41.9%). Overall, XML, web-enabled communications, e-payment, and e-procurement are the applications which are expected to be deployed increasingly over the next few years. Although almost all supply chain applications are expected to be deployed increasingly over the next few years, the use of e-compliance is not expected to increase as much.

These trends are shown in Fig. 1.17 below.

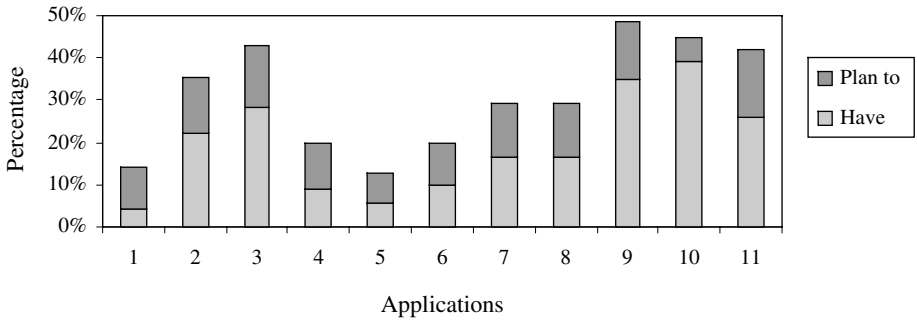

Fig. 1.17. Communication with trading partners.

Codes for the applications are as follows:

1. Partner relationship management (PRM)
2. E-procurement
3. E-payment
4. Collaborative forecasting
5. E-compliance
6. Collaborative planning
7. Demand planning and replenishment
8. Sourcing and procurement management
9. Web enabled communication
10. EDI
11. XML-based communications

Question 18 — What IT-based channels and B2B mechanisms are organizations using for purchasing?

Organizations are using direct purchasing (21%), long-term purchasing contracts (16.1%) and catalogues (12.8%) as B2B mechanisms for purchasing. Channels such as hubs (1.4%) and aggregators (2.4%) are the least used, as shown in Fig. 1.18.

Codes for the mechanisms are as follows:

1. Direct purchasing
2. Long term purchasing contracts
3. Catalogues
4. OEM links/hubs
5. Joint ventures and projects
6. Collaborative purchasing

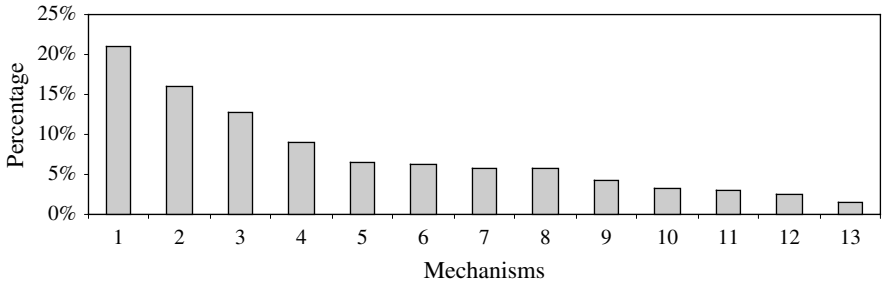

Fig. 1.18. Purchasing mechanisms.

7. Flexible, short-term contracting
8. Online marketplaces
9. Auctions/e-auctions
10. Buy side exchange or hub
11. Exchanges e-exchanges
12. Aggregators
13. Sell side exchange of hub

1.3.16. *Business results*

Questions 19 & 20 — What economic and operational business results and strategic areas are being impacted by technologies?

Various economic and operational results are impacted by technology. The highest cost reductions (decreased or significantly decreased) are in internal communications (36.7% organizations) and production (35.1% organizations). The costs have also decreased for customer service, human resources (HR), new product time to market (TTM) and market research.

The areas where costs have increased or significantly increased include technology (48.4% organizations) and consultancy and communication (24.2% organizations).

These business results are shown in Fig. 1.19.

Codes for the applications are as follows:

1. R&D costs
2. Production costs
3. Market research costs
4. Advertising and direct marketing costs
5. Promotional and customer loyalty costs
6. Commercial costs
7. Customer service costs
8. Technology costs

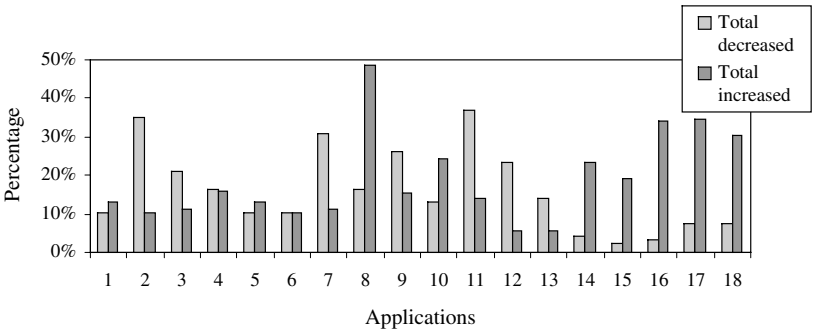

Fig. 1.19. Technology's impact on economic and operational results.

9. Human resources costs
10. Consultancy and collaboration costs
11. Internal communication costs
12. New product's time to market
13. New product's failure risks
14. Number of new products
15. Market share
16. Revenues
17. Profits
18. Margins

The technology has also impacted strategic areas in organizations. An understanding of customer satisfaction for current products and services, customer buying behaviour, knowledge of competitor's products and services, and understanding of future product expectations have all improved for about 40% of the organizations with technology deployment.

These are shown in Fig. 1.20.

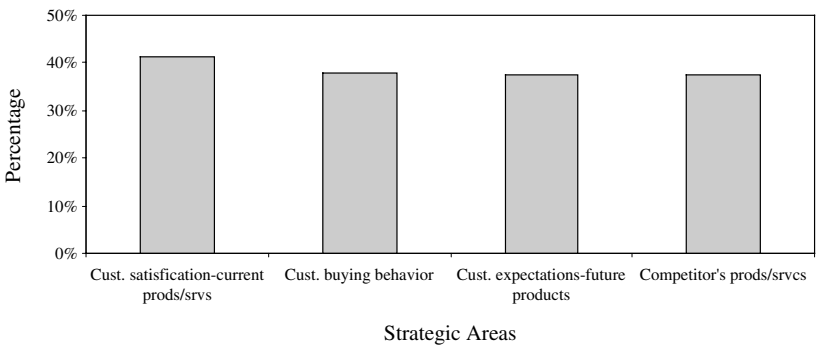

Fig. 1.20. Strategic areas impacted by technology.

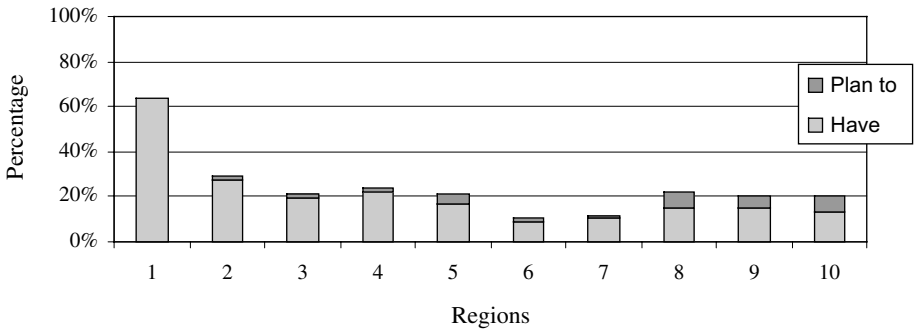

Fig. 1.21. Globalization regions.

1.3.17. *Globalization*

Questions 21 & 22 — Are organizations becoming more global? Is the geographic reach of organizations increasing?

Globalization in terms of the regions to which organizations have expanded or are planning to expand to is shown in Fig. 1.21. About 29% of the organizations currently have or plan to have operations in Canada and Mexico (NAFTA); about 24% in Western Europe; about 21% in Latin America and about over 20% in each of SE, East and South Asia. The three Asian regions also top the list of regions where organizations are planning to expand to the most, over the next few years. Increasing globalization is observed in SE, East and South Asia as well as in Central and Eastern Europe.

Codes for the regions are as follows:

1. USA
2. Canada and mexico (NAFTA)
3. Latin America
4. Western Europe
5. Central and Eastern Europe
6. Africa
7. Middle East
8. Southeast Asia
9. South Asian
10. East Asia

Organizations are increasing (or somewhat increasing) their geographic reach in terms of trade in other countries (29.4% organizations), the number of production or service bases in other countries (28.2% organizations), and the number of countries in the supplier base (23.8% organizations). Increased average distance to suppliers,

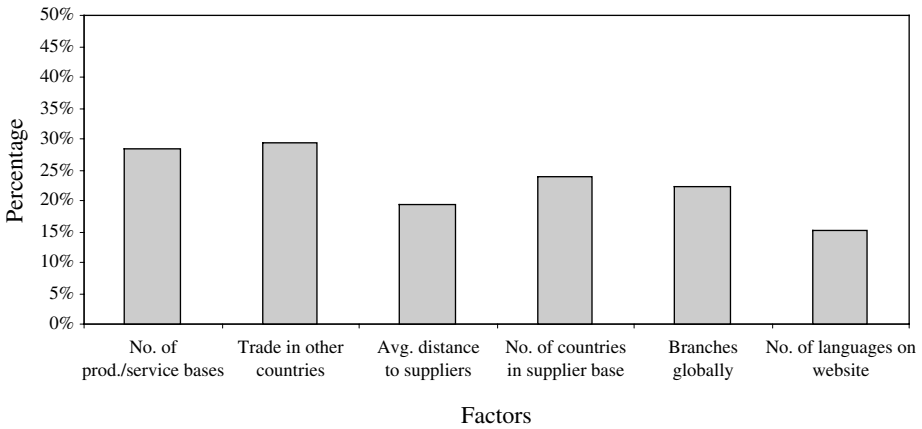

Fig. 1.22. Globalization trends.

increase in branches/distribution centers globally and the number of languages on the website and in brochures are the other factors that are considered.

These are shown in Fig. 1.22 above.

Acknowledgments

The support for the 2003–2004 BIT Survey has come from UCLA International Institute's Global Impact Research Program, UCLA Anderson School's Center for International Business Education and Research (CIBER), Applied Computer Research and UCLA Anderson School's Price Center for Entrepreneurial Studies and UCLA Anderson School's Entertainment Management Program. The authors would like to thank all these sponsors and supporters.

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Appendix A: Survey Methodology

The second year survey for the BIT study was conducted as a survey mailed to target organizations in multiple industry sectors. Each subject in the study was an independent organizational entity that controlled its own information technology and information policy, and had a chief information officer (CIO) or similar management position within it. It is likely that since the subject organizations are able to make their own technology decisions (and investments), they also have profit and loss responsibility, although this is certainly not necessarily always the case. The surveys were addressed to the CIO (or similar position) as the person most likely to be knowledgeable about the subject.

One of the reasons to use a survey (rather than interviews, case studies or direct data collection) was to be able to address a large number of industry sectors. Understanding the impact of technology on a large number of sectors was important from the base line perspective so as to provide a more complete understanding of phenomena across the economy. Of course, the impact of information technologies is highly dependent on the underlying nature of each industry and the survey is being supplemented by studies at the sector level.

The major issues of interest were developed, which were then used to generate survey questions. The survey instrument was mailed to a database of over 25,000 individuals across all industry sectors in the United States. The data was acquired from an independent entity that collects corporate data. The CIOs (and related positions) were requested to complete the survey either by mail or online, where the survey instrument was also made available. Some face-to-face interviews were also conducted in the pilot phase of developing the survey.

The survey instrument (questionnaire) has seven major sections:

1. Technology adoption/infrastructure and budget trends — technologies adopted and budget trends.
2. Internal organization — changes in the internal organization's workforce, structure and in business process outsourcing due to technologies.
3. Customer facing interactions — changes in advertising, image, relationship management and other customer facing interactions due to technologies.
4. Trading partner relationships — changes in partner communications and purchasing mechanisms used due to technologies relationships.
5. Business results — operational and economic business results and strategic areas impacted by technologies.
6. Globalization — globalization of the organization due to technologies.
7. Organizational profile — the basic "demographics" of the organization.

Appendix B: Survey Respondent Sample Characteristics

About 250 responses were received. The sample characteristics were:

Titles of the respondents were as follows	
CIO and other C level executives	27.4%
Directors	29.0%
Managers	16.5%
VPs	8.9%
Officers	5.2%
No Response	12.9%
Size of organization in terms of	
Annual revenues	
Up to 100 million dollars annual revenues	31.1%
100 million to 1 billion dollars	34.7%
Over 1 billion dollars	10.1%
No response or Not Applicable	24.2%
Number of employees	
Up to 200 employees	8.1%
200 to 1000 employees	37.5%
Over 1000 employees	40.7%
No response or Not Applicable	13.7%
IT characteristics of organization in terms of	
IT Budget as a percentage of annual revenue	
Up to 1%	25.8%
1% to 5%	33.9%
Over 5%	16.9%
No response or Not Applicable	23.4%
Number of IT employees	
Up to 10 IT employees	25.4%
10 to 50 IT employees	33.9%
Over 50 IT employees	25.8%
No response or Not Applicable	14.9%
Sectors of organizations North American industry classification system (NAICS)	
Manufacturing (Metals, Machinery, Computer, Electronics electrical transportation Equipment, furniture, miscellaneous)	23.4%
Educational services	10.5%
Government	9.3%
Professional, scientific & technical services	8.5%
Wholesale trade	7.3%
Healthcare & social assistance	6.9%
Construction	5.7%
Information	2.8%
Manufacturing (paper, printing, petroleum, coal, chemical, plastics, rubber, nonmetalic mineral)	2.8%
Transportation	2.4%
Utilities	0.8%
Arts, entertainment and recreation	0.4%
Administrative & support, waste management & Remediation services	0.4%
No response	16.1%

Appendix C: Current BIT Partners

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Dr. Vandana Mangal, Associate Research Director BIT (Lead)
Uday Apte, Professor, Naval Postgraduate School

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Theseus Institute, **France**
Craig Marsh, Professor, Human Resource Strategy (Lead)

Athens University of Economics and Business, **Greece**
Gregory Prastacos, Professor, Athens University of Economics
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Ananth Srinivasan, Professor, University of New Zealand (Lead)

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Genaro Matute Mejia, Professor, ESAN (Lead)

IESE Business School, **Spain**
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