The Business and Information Technologies (BIT) Survey

ANNUAL REPORT 2003-04

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The Business and Information Technologies (BIT) Research Project

The Center for Management in the Information Economy (CMIE)

The Anderson School of Management at UCLA

TABLE OF CONTENTS

The Business and Information Technologies (BIT) Survey[1]
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Summary

The UCLA Business and Information Technologies (BIT) Survey is a baseline study aimed at understanding and tracking the impacts of technologies on business practices. This report presents the results of the first survey conducted in the US in 2003-2004.

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

The survey addressed a wide range of business practice, including technology adoption, internal organization, market facing activity, supplier and vendor relationships, and business results and performance consequences from the application of new technologies.

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 that 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 indeed becoming more flat, with a wider span of control, more geographically distributed, and more "virtual".

- 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.

[1] Acknowledgements
Support for the 2003-2004 BIT Survey has come from CMIE, UCLA International Institute's Global Impact Research Program, the AT&T Foundation, UCLA Anderson School's Center for International Business Education and Research (CIBER), Applied Computer Research and UCLA Anderson School's Entertainment Management Program. The authors would like to thank all these sponsors and supporters.

- The degree to which outsourcing and off-shoring are being pursued is quite limited. IT services, payroll and market research are the more widely outsourced business functions. It will be interesting to see if this changes in the next survey.

- The technologies and systems that are the most widely adopted are eCommerce tools and websites, wireless hardware and software, security tools, collaboration and portal tools, and groupware/productivity tools. Among these, wireless and collaboration/portal tools are also on budgets for near-term planned adoption.

- Biometrics and digital receipts are not being widely examined or adopted. This seems a bit at odds with the high interest in security. One might conclude that security with respect to communications, data protection, site intrusions and the like, is the major concern at present. Security and identification in the physical sense is less of an issue.

- Radio Frequency Identification (RFID) is another technology that companies have not widely adopted as yet. However, many firms do plan to purchase RFID related systems in the near future.

- 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 communications 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 firm wide organizational structures are changing. It is also clear that certain technologies and capabilities have been very widely adopted; eCommerce 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.

Introduction: The BIT Project

Notwithstanding reports to the contrary, the Information Economy is alive and well. The study by Apte and Nath [1] that follows earlier work by Machlup [2, 3] and Porat [4], 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 on-line 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 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 co-location 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 may 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 such as 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, that 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 for 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 on-line channels. For example, newspapers are not now or in the future, the strongest suppliers of "breaking" news, especially in multi-media 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 that 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 United States and the rest of the world. The first step in the process is to do a base line study that 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 at a global scale. At the time of writing, the project has nine partners in leading academic and research institutions around the world. The partners include SDA Bocconi (Italy), SOM-IITB (India), Theseus Institute (France), The World Internet Institute (Sweden), EIM (Germany), IESE (Spain), PUC (Chile), Korea University (Korea), and CEIBS (China). Details on the BIT partners are in Appendix C. Two other teams (Italy and India) have also conducted surveys in 2003-2004. Three more will also conduct a survey 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 wire-line 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. Prof. 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 first BIT survey conducted in the United States and Canada in 2003-2004. The hypotheses and the results are discussed in the following sections. The methodology used is described in the Appendix. 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.

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 that 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 major issues and their relationship to questions in the survey are summarized below.

Technology Adoption/Infrastructure and Budget Trends

Question 1 – What technologies are organizations using currently or planning to use in the neat 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 3 years?

Internal Organization

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 non IT functions? How much of the total outsourced business is offshore?

Customer Facing 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?

Trading Partner 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?

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?

Globalization

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

Results

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

Technology Adoption/Infrastructure and Budget Trends

- Websites/E-commerce and Wireless hardware and software are the most used technologies.
- Biometrics, Digital Receipts and Radio Frequency Identification (RFIF) are not widely adopted by organizations. However, many plan to purchase RFID in the next 3 years.
- Budgets for Security software and hardware, Software Applications, Storage hardware and Wireless technologies have increased. Budgets for Offshore outsourcing and on-demand computing have not increased significantly.

Internal Organization: Workforce Trends

- The proportion of employees facing a screen has increased. There is a demand for decision support tools at executive levels, and for collaborative work tools. There is an increase in demand for IT skills at lower levels in the organization.
- Although Teleconferencing is becoming popular, Telecommuting is not as widely accepted by organizations.
- Automation is causing workforce reductions. However, respondents do not believe that outsourcing is causing reductions in the workforce.

Internal Organization Structure Trends

- The adoption of new decision making tools and online technologies has increased.
- Organizations are becoming flatter, have fewer levels of control and fewer middle level managers. Telecommuting though not extensively used today, is increasing and organizations are becoming geographically dispersed. As a result the use of Teleconferencing is increasing.
- More organizations are monitoring the productivity of customer facing employees and employing automated monitoring of workforce productivity. However, compensation is not based on these observations.
- Some organizations note a shift in the IT function from a staff role to line responsibilities, but this is not widespread as yet.

Internal Organization - Business Process Outsourcing (BPO)

- Market Research, Payroll and IT Programming are the most outsourced business functions and processes. Finance, Order Fulfillment and Accounting are the least outsourced business functions.
- Organizations outsource about the same percentage of their IT functions as their non IT functions.

Customer Touch Points

- More than one-third of the responding organizations use Online Technologies and Online Customer Touch Points and a little under one-third use Other Technologies (such as fax) as customer Touch Points.

Customer View Integration and Customer Segmentation

- Data Marts and Warehouses as well as Statistical Data Mining are the most popular tools for customer view integration.
- Almost a quarter of the organizations segment customers by geography. A fifth use portals.

Online Advertising and Selling

- Incentives in printed materials to drive customers to the company website are quite widely used. 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 the most popular online advertising methods.
- Very few organizations have changed their online image in terms of product or company name, branding concept, logo or slogan.

Customer Relationship Management (CRM) function Automation

- The CRM functions automated most often include Help Desks, Order Tracking and Fulfillment, and Order Placement. CRM functions with the lowest degree of automation are Sales Calls.

Traditional versus Online Selling

- The data collected and self service tasks performed by customers are higher for online selling while sales volumes, cost of products and the number of products offered are higher in traditional selling.

Trading Partners Relationships

- Electronic Data Interchange (EDI), XML and Web-enabled communications are the most popular communication technologies. XML and E-payment are two

technologies that several organizations are planning to adopt and implement in the next 3 years.

Purchasing Mechanisms

- Direct Purchasing, Long-term Purchasing and Catalogues are the most used B2B mechanisms used for purchasing. Exchanges/E-exchanges, Buy-side Exchanges/Hubs and Sell-side Exchanges/Hubs are the least used purchasing mechanisms.

Business Results

- Internal Communication costs and Productions costs have decreased with technology adoption. Technology costs, Consultancy and Collaboration costs have increased.
- Technology has helped organizations obtain an understanding of their customer's satisfaction with current products and services and has improved the company's knowledge of their competitors' products and services.

Globalization

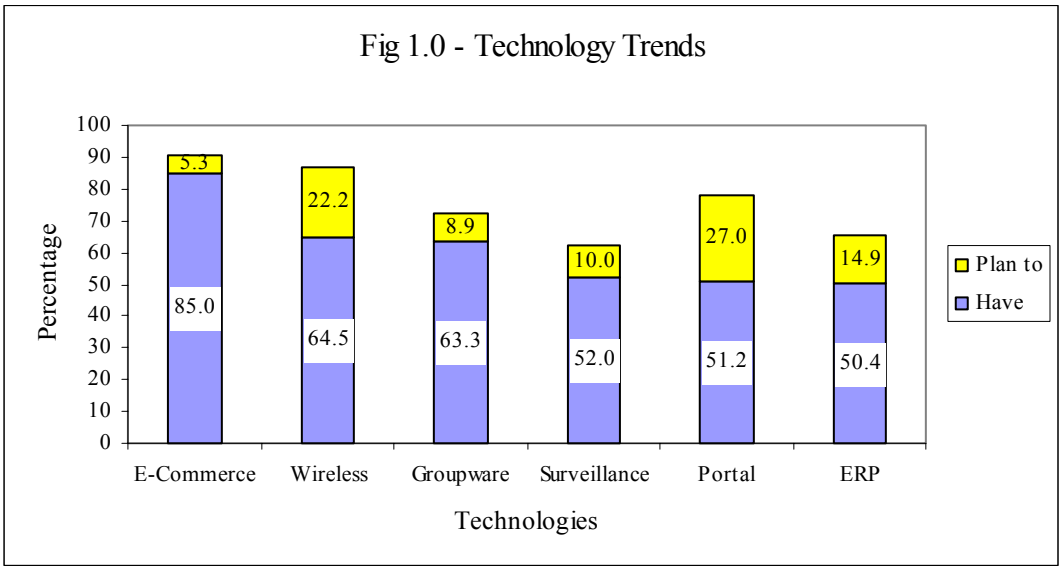
- Almost a third of the responding organizations are increasing globalization in terms of Trade with other Countries and more than a quarter are increasing the number of their production or service delivery bases in other countries.
- Organizations are expanding to Canada and Mexico (NAFTA), Western Europe, Latin America and South-east Asia. Very few organizations plan to establish operations in Africa or the Middle East.

Technology Adoption/Infrastructure and Budget Trends

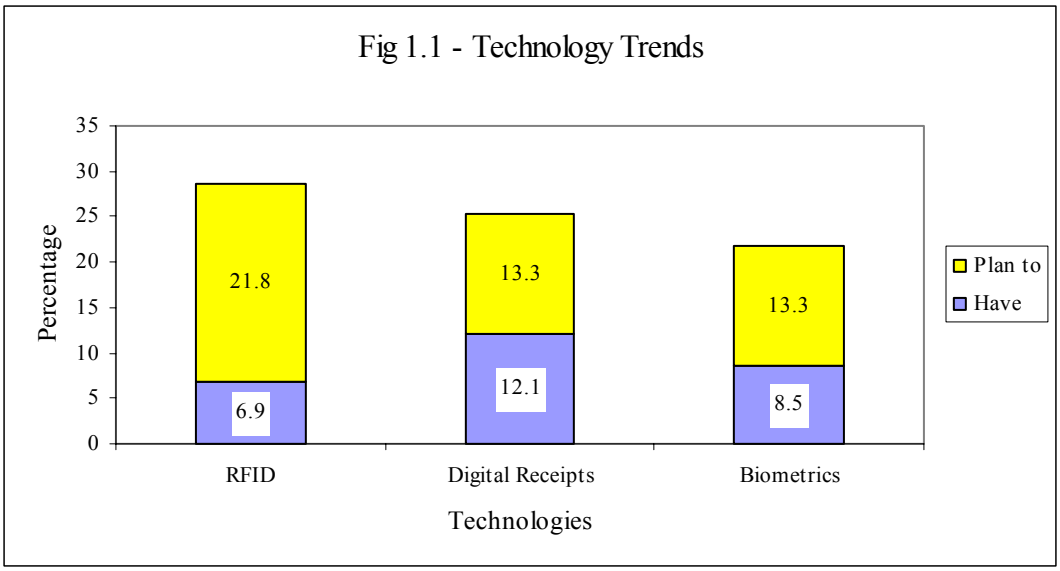
Question 1 – What technologies are organizations using currently or planning to use in the near future? What technologies are organizations not using and not planning to use in the future?

An overwhelmingly large number of organizations (90.3%) either already have or plan to have Websites and E-commerce technologies within the next 3 years. 86.7% of the organizations have/plan to have Wireless Hardware and Software; 78.2% have/plan to have Collaboration and Portal Tools; 72.2% have/plan to have Groupware and Productivity tools such as Lotus Notes; 62% have/plan to have Surveillance tools and 65.3% of the organizations have/plan to have Enterprise Resource Planning (ERP). Among these technologies, Collaboration/Portal Tools (27%) and Wireless Technologies (22.2%) are the two most popular technologies on company budgets and slated for adoption in the next 3 years.

These trends are shown in Figure 1.0 below.



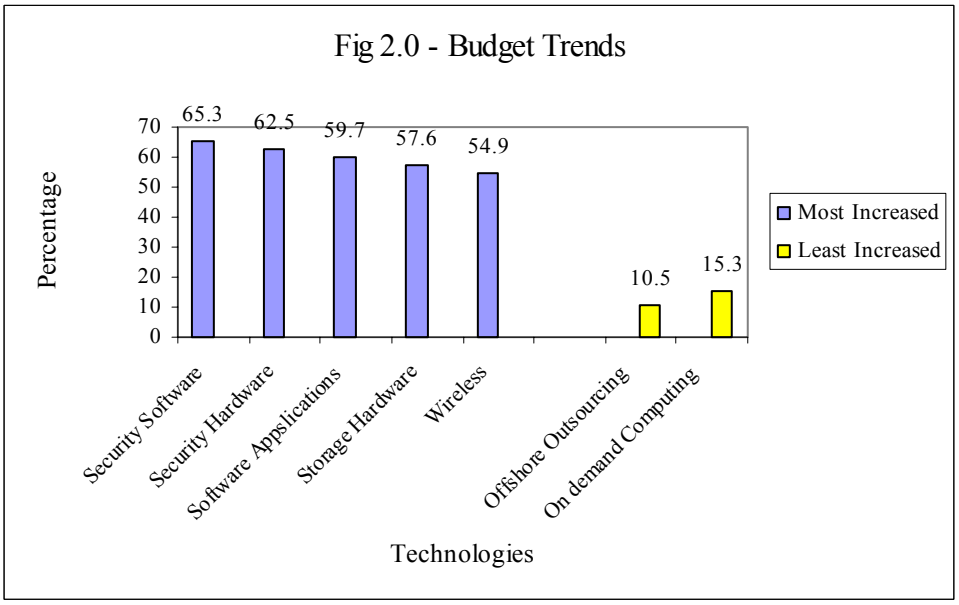
Technologies that fewer organizations plan to purchase in the next 3 years include Biometrics (21.8% have/plan to have while 43.9% of the organizations do not plan to have) and Digital Receipts (25.4% have/plan to have while 38.3% do not plan to have). Radio Frequency Identification (RFID) is currently adopted only by a very small percentage of organizations (6.9%). However, 21.8% organizations plan to purchase the technology in the next 3 years. These trends are shown in Figure 1.1 below.



Question 2 – What technologies have organizations invested in (and not invested in) over the last 3 years?

Security software (increased or increased significantly in 65.3% organizations) and Security hardware (increased or increased significantly in 62.5% organizations) top the list of technologies organizations have invested in over the past 3 years. Software applications (59.7%), Storage hardware (57.6%) and Wireless hardware and software (54.9%) budgets have also increased.

On the other hand, budgets for offshore outsourcing (10.5%) and on-demand computing (15.3%) have increased the least in the last 3 years. These trends are shown in Figure 2.0 below.



Internal Organization

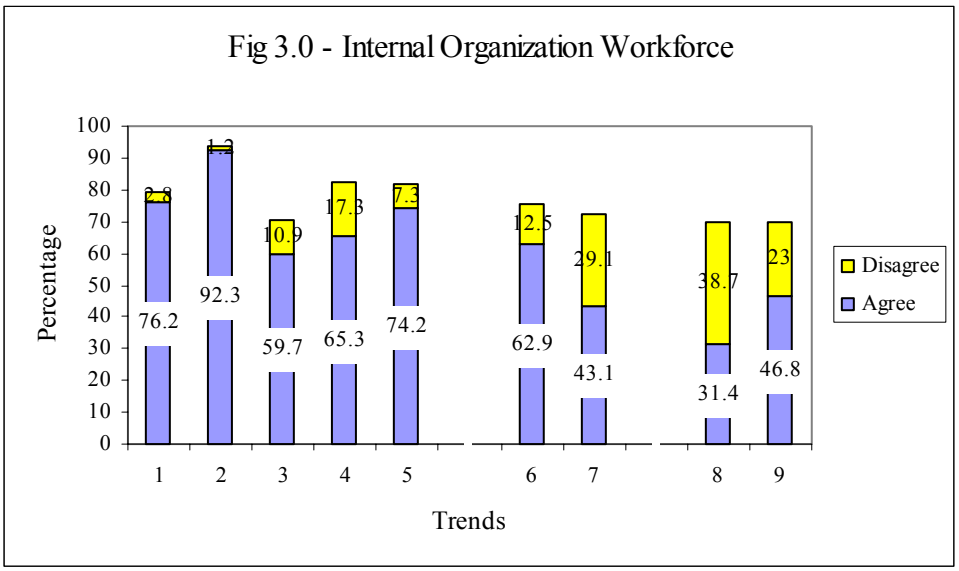
Question 3 – How are organizations changing internally in terms of their workforce and the workplace?

Overall, the proportion of employees facing a screen is increasing. Demand for decision support tools at executive levels is increasing. Collaborative work due to technology is also increasing somewhat. Demand for IT skills at lower levels in the organization is also increasing. In addition, to keep up with changing technologies, employees need to retrain constantly.

Although there is greater support for teleconferencing in organizations, telecommuting is not as widely accepted by organizations.

Automation is felt to be causing workforce reductions. However, outsourcing is not felt to be a cause for workforce reductions in organizations.

These trends are shown in Figure 3.0 below.



Codes for the trends are as follows:

1 Proportion of employees facing a screen is increasing
2 Demand for intelligence in information at executive levels is increasing
3 Collaboration between workers from use of internet-based technologies is increasing
4 The need for IT skills at lower levels is going up
5 Workers need to retrain constantly to keep up with changing technologies
6 Use of teleconferencing is on the rise
7 More employees are telecommuting
8 Outsourcing is leading to workforce reductions

9 Automation of functions is leading to workforce reductions

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

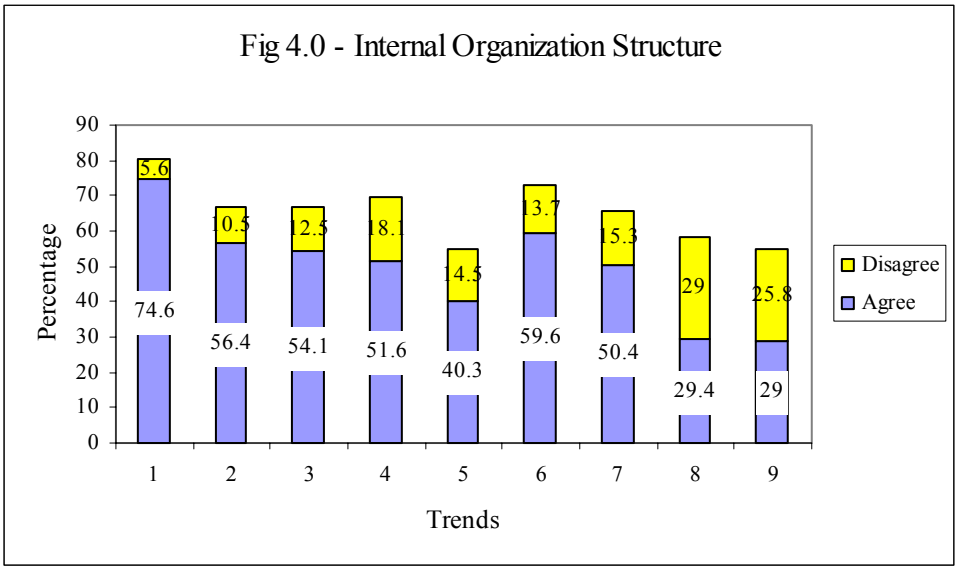
The most significant trend is the increasing availability of new decision making and online technologies, as reported by almost three-quarter (74.6%) of the organizations.

Organizations are becoming flatter with fewer direct reports to each manager. Heterarchical organizations, widening the span of control of managers are becoming common. Organizations are becoming geographically dispersed with direct reports to a manager not located at the same location as the manager. Reduction in middle level management is somewhat observed.

Although a large number of organizations monitor customer facing interactions and, automated monitoring of workforce productivity is increasing, results do not indicate that organizations provide incentives to employees based on their productivity.

Support is not found for IT functions shifting from staff to line.

These trends are shown in Figure 4.0 below.



Codes for the trends are as follows:

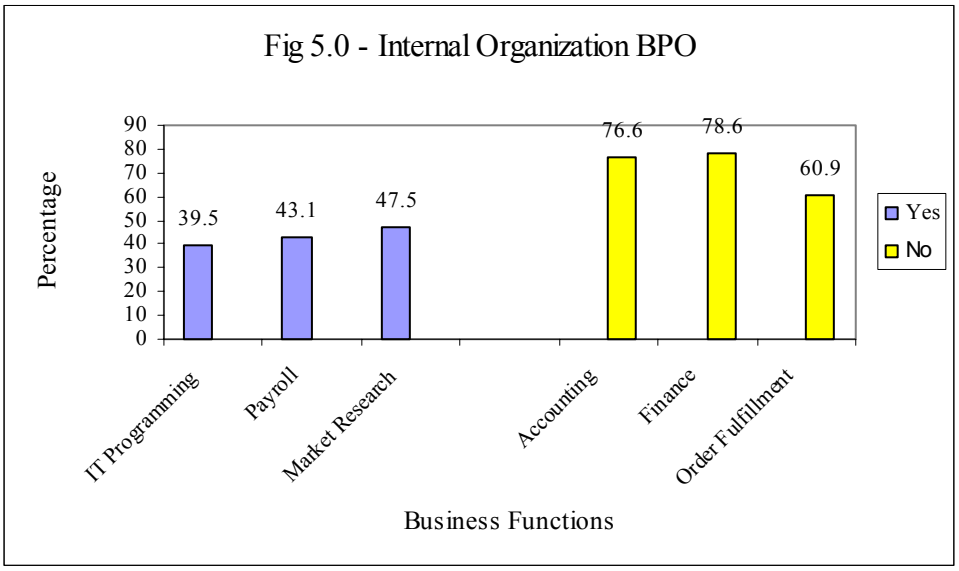
1 New decision making tools and online technologies are increasingly becoming available
2 Span of control for most managers is widening
3 Organization is becoming flatter

4 Organization is becoming geographically dispersed
5 Number of middle level managers is decreasing
6 Service productivity is increasingly being monitored
7 Automated monitoring of workforce productivity is increasing
8 Incentives are based on monitoring of productivity
9 IT function is shifting from staff to line

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?

The most often outsourced business processes are Payroll, Market Research and IT Programming. 47.5% of the organizations outsource market research either significantly, partially or have plans to outsource in the next 3 years. Payroll is outsourced (partially or significantly or planned) by 43.1% of the organizations and IT Programming by 39.5% of the organizations. Finance, Accounting and Order Fulfillment are not outsourced with 78.6%, 76.6% and 60.9% of the organizations not currently outsourcing these business process functions respectively.

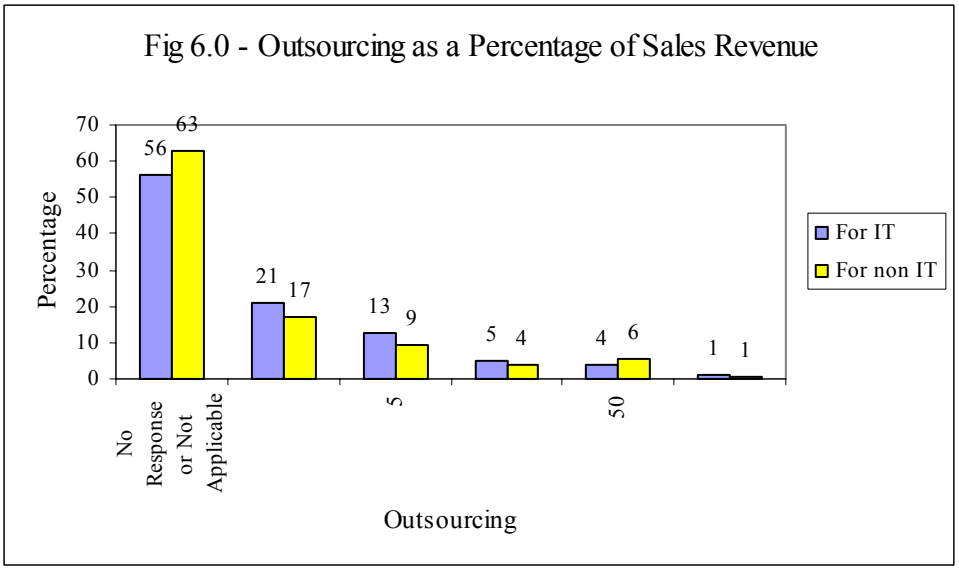
These are shown in Figure 5.0 below.



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

Organizations outsource about the same percentage of their IT functions as their non IT functions. Outsourcing patterns are shown in Figure 6.0 below. About a fifth (21%) of the organizations outsource up to 1% of their IT functions (as a

percentage of total sales revenue), 13% outsource up to 5% of their IT functions (as a percentage of total sales revenue) and 5% outsource up to 10% of their IT functions (as a percentage of total sales revenue). In terms of non IT functions (as a percentage of total sales revenue), about 17% of the organizations outsource up to 1%, under 10% outsource up to 5% and, 4% outsource up to 10% of their non IT functions. These results are based on a smaller sample as more than 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.



Although the survey instrument contained a question on offshore outsourcing (question 7), only a few responses were obtained hence, the results are not reliable. These results are therefore not documented in the current report.

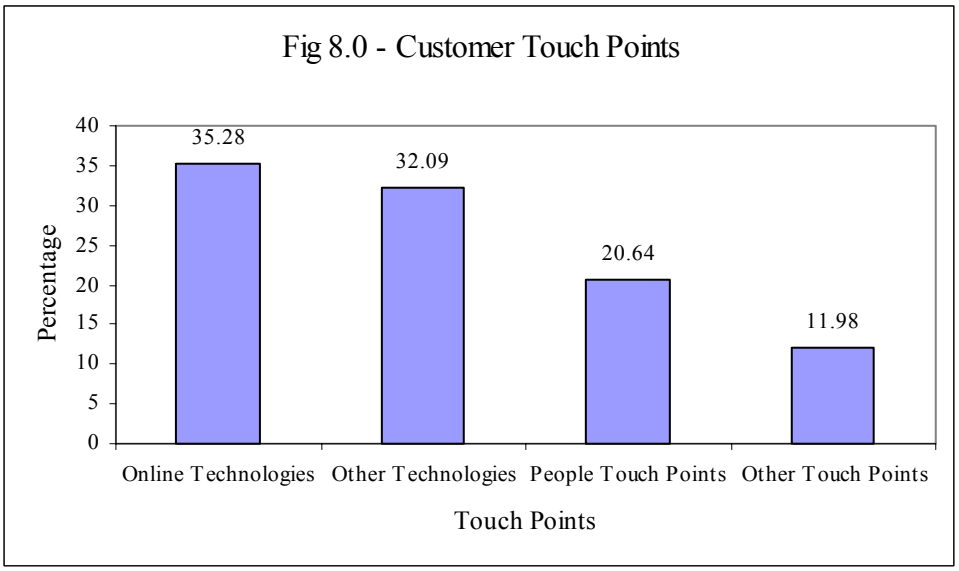
Customer Facing Interactions

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 (13.41%), email (13.15%), face-to-face (12.7%), company website – brochure-ware (12.17%) and regular mail (11.46%) are the most frequently used touch points. Screen pops (1.11%) and phone text messaging (1.69%) are the least used by organizations.

Touch points are grouped into the categories of Online Technologies, Other Technologies, People Touch Points and Other Touch Points. Their usage frequency is shown in Figure 8.0 below.

Touch points using Online Technologies are used by more than one-third (35.28%) of the organizations; touch points using Other Technologies are used by almost one-third (32.09%) of the organizations; over one-fifth (20.64%) of the organizations use People touch points and 11.98% of the organizations use Other touch points. Online Technologies include email, company website (brochure-ware), company website (transactional), screen pops and online intermediaries; Other Technologies include fax, phone, phone text messaging, phone (IVR - Interactive Voice Response) and phone (CTI - Computer Telephony Integration); People touch points include face-to-face interactions and referrals; and Other touch points include regular mail and any touch points that may not be in the list.



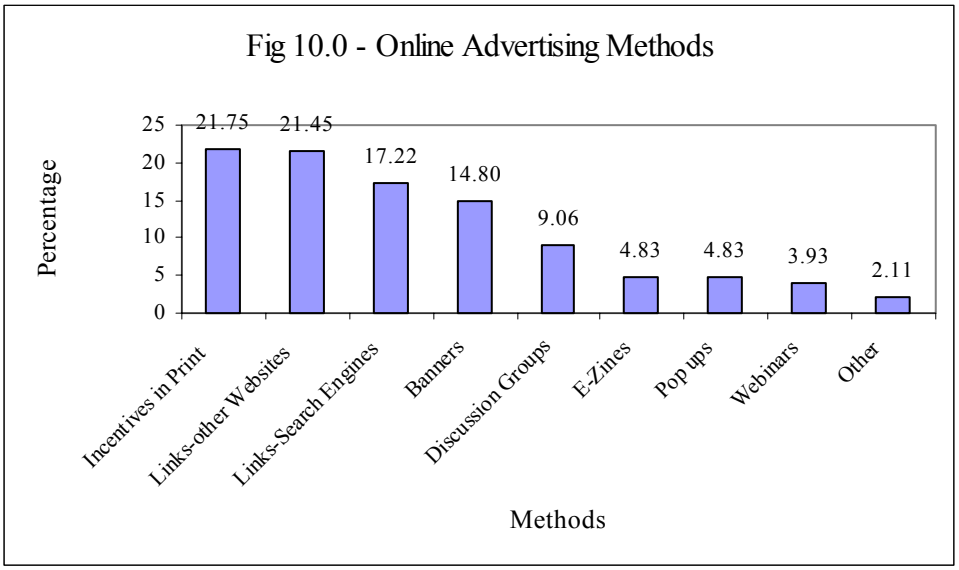
Questions 9 & 14 – How are Customer Views integrated into the organization using certain technologies? What mechanisms are used by organizations to perform customer segmentation?

Various technologies are used to integrate customer views into the organization. Data Marts/Data Warehouses is the technology used by almost a fifth (19.58%) of organizations; Statistical Data Mining is used by 17.85% organizations and Customer Profiling is used by 15.16% organizations. Data mining with neural networks (1.73%) and Text Mining (2.11%) are the least used technologies for customer view integration.

Almost a quarter (24.5%) of the organizations segment customers by geography and over one-fifth (21.19%) use portals for segmenting their customers. The least used methods for customer segmentation are automated cross-selling (e.g., using ATMs for banks) (5.96%) and developed user communities – in terms of channel management (8.94%).

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 more than a fifth (21.75%) of the organizations; Advertisements or Links on other websites to drive traffic to the company website are used by 21.45% organizations, Advertisements or Placement in search engines to drive traffic to the company website are used by 17.22% organizations and Web Banners are used by 14.8% of the organizations. These and other trends are shown in Figure 10.0 below.



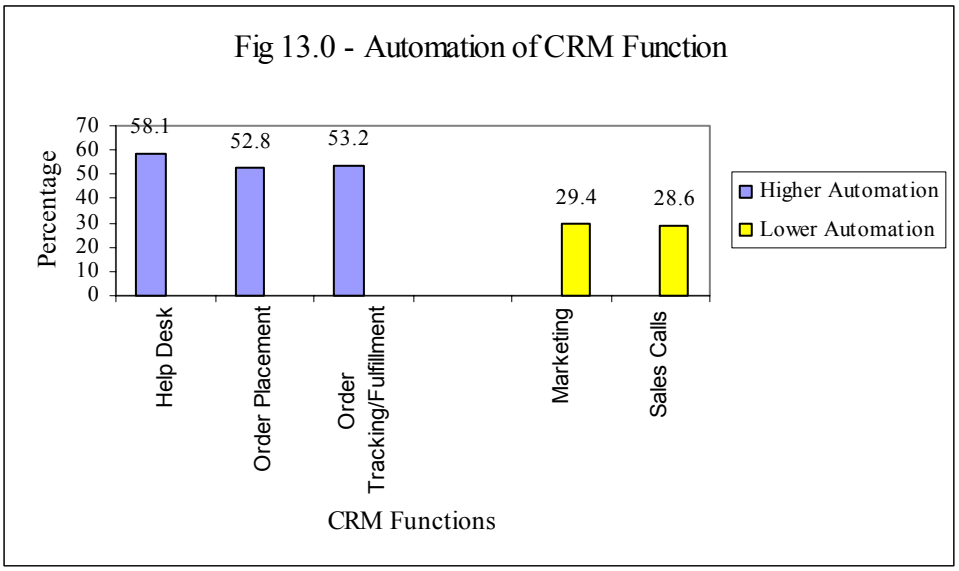
Although a large number of organizations currently have websites, only a few organizations have changed their online image in terms of their slogan, logo,

name or branding concept. Among the organizations that have a new/changed image in going online, branding concept (23%) and logo (23%) have been changed in most cases.

The survey instrument contained a question (question 11) on online advertising budgets. However, due to the few responses that were obtained for this question, data is not reported here.

Question 13 – Which Customer Relationship Management (CRM) functions have been automated?

CRM functions that are automated (either partially or completely) include Help Desk, Order Placement and Order Tracking and Fulfillment. CRM functions that have been automated the least include Sales Calls and Marketing. As shown in Figure 13.0 below, 58.1% of the organizations have automated Help Desk, 53.2% of the organizations have automated Order Fulfillment and Tracking and 52.8% of the organizations have automated Order Placement. Only about a quarter of the organizations have automated their Sales Calls (28.6%) and Marketing (29.4%) functions.

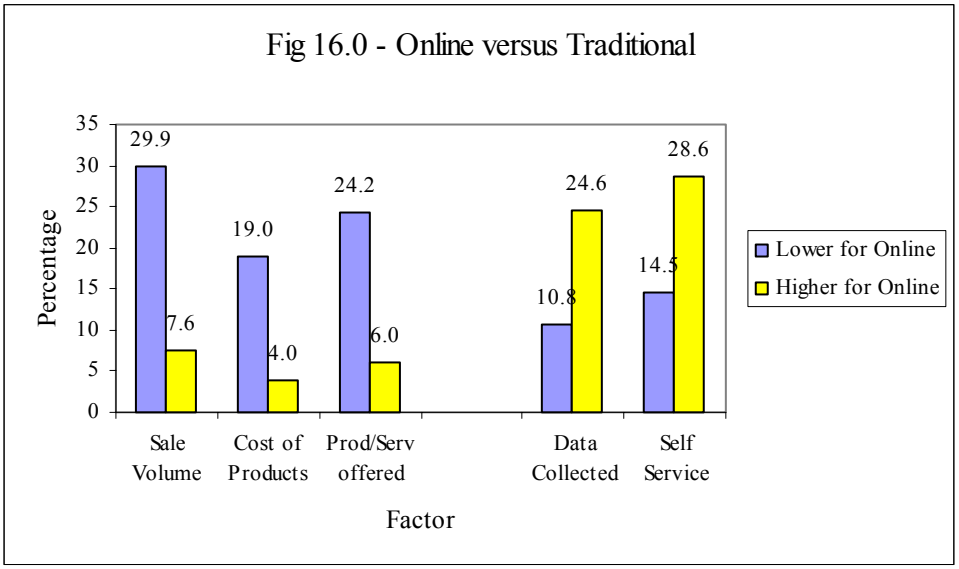


Questions 15 & 16 – Are the number of organizations selling products and services online increasing? How is online business different from traditional business?

More than half of the organizations (58.17%) offer Traditional as well as Online services and products. Although one-third (32.69%) of the organizations have only traditional stores, only 1.44% organizations have online stores only.

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 16.0 below shows these differences. Lower as well as Significantly Lower responses are combined under the category of Lower for Online; Higher as well as Significantly Higher responses are shown under Higher for Online. As seen in the figure, online sales volumes are lower than traditional sales volumes for almost one-third (29.9%) of the organizations, Products and Services offered are lower for online for 24.2% organizations and Cost of Products are lower for online for about one-fifth (19%) of the organizations. Data Collected and the number of Self Service tasks performed by customers are higher for online for 24.6% and 28.6% of the organizations respectively.



Trading Partner Relationships

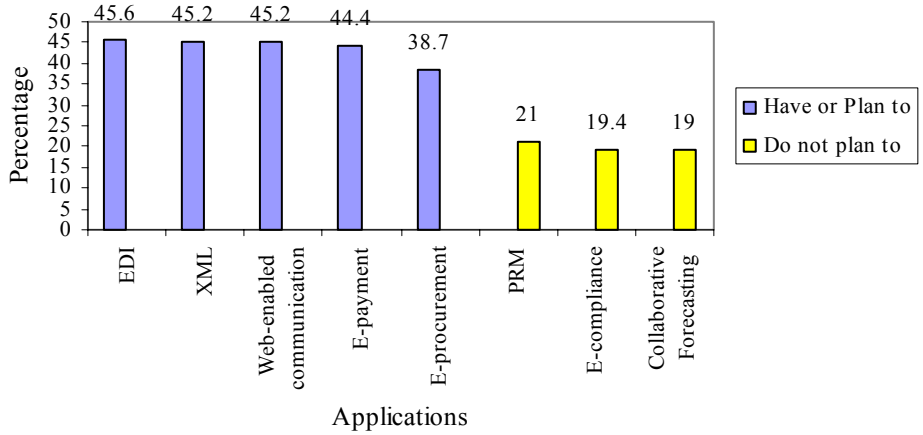
Question 17 – What application technologies are organizations using for communicating with their trading partners?

The most popular technology applications for communicating with trading partners used by organizations include Electronic Data Interchange (EDI) (45.6% of the organizations either have or plan to have the application), XML (45.2% of the organizations either have or plan to have the application) and Web-enabled communications (45.2% of the organizations either have or plan to have the application). Among these applications, XML (25.8% have, 19.4% plan to purchase) and E-payment (24.6% have, 19.8% plan to purchase) although not used as often as EDI (38.7% have, 6.9% plan to purchase) currently, are applications organizations plan to purchase in the next 3 years.

Partner Relationship Management (PRM) (21%), E-compliance (19.4%), and Collaborative Forecasting (19%), are applications that many organizations do not have and do not plan to purchase in the next 3 years.

These trends are shown in Figure 17.0 below.

Fig 17.0 - Communication with Trading Partners



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

Organizations are using Direct Purchasing, Long-term Purchasing Contracts and Catalogues as B2B mechanisms for purchasing. Channels such as Exchanges/E-exchanges, Buy-side Exchanges/Hubs and Sell-side Exchanges/Hubs are the least used, as shown in Figure 18.0 below.

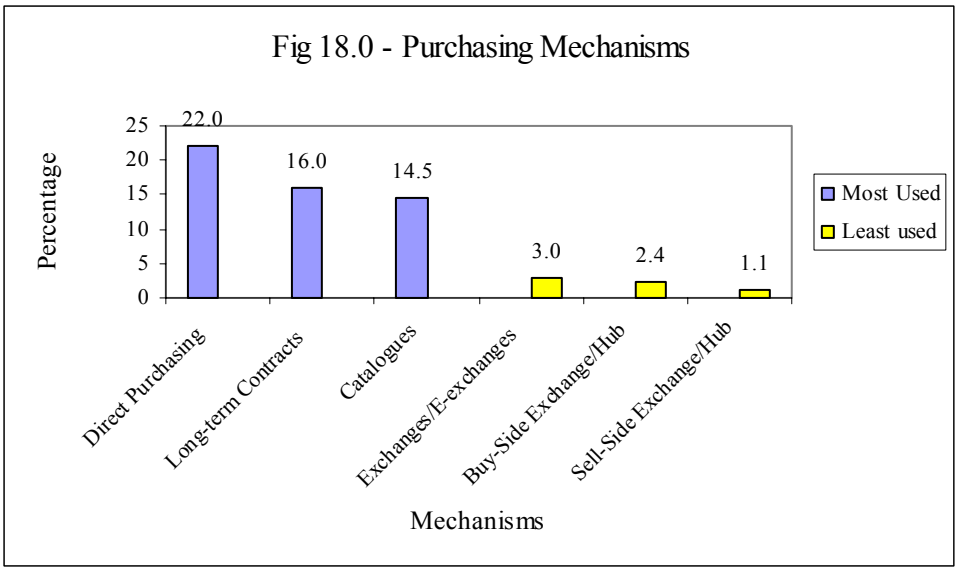


Fig 18.0 - Purchasing Mechanisms
Percentage
25
20
15
10
5
0
22.0
16.0
14.5
3.0
2.4
1.1
Direct Purchasing
Long-term Contracts
Catalogues
Exchanges/E-exchanges
Buy-Side Exchange/Hub
Sell-Side Exchange/Hub
Mechanisms
Most Used
Least used

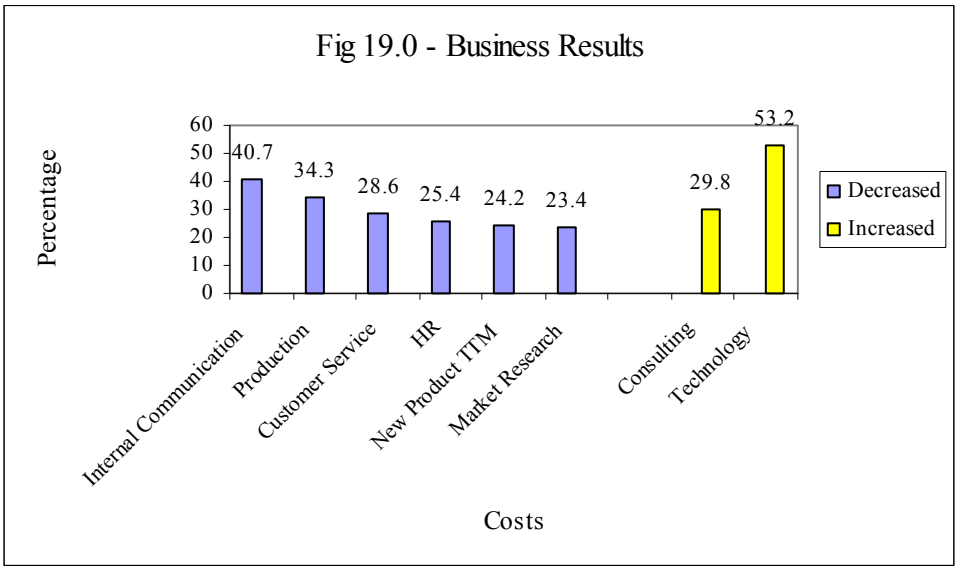
Business Results

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 are in Internal Communications (decreased or decreased significantly in 40.7% organizations) and Production (decreased or decreased significantly in 34.3% organizations). Costs have also decreased for Customer Service, Human Resources (HR), New Product Time to Market (TTM) and Market Research.

However, Technology (increased or increased significantly in 53.2% organizations) and Consultancy and Communication (increased or increased significantly in 29.8% organizations) costs have gone up.

These business results are shown in Figure 19.0 below.



Technology has also impacted strategic areas in organizations. Understanding of Customer Satisfaction for Current Products and Services (51.2%) and Knowledge of Competitor's Products and Services (45.9%), Understanding of future product expectations (40.8%) and of customer buying behavior (40.7%) has improved due to technology.

These are shown in Figure 20.0 below.

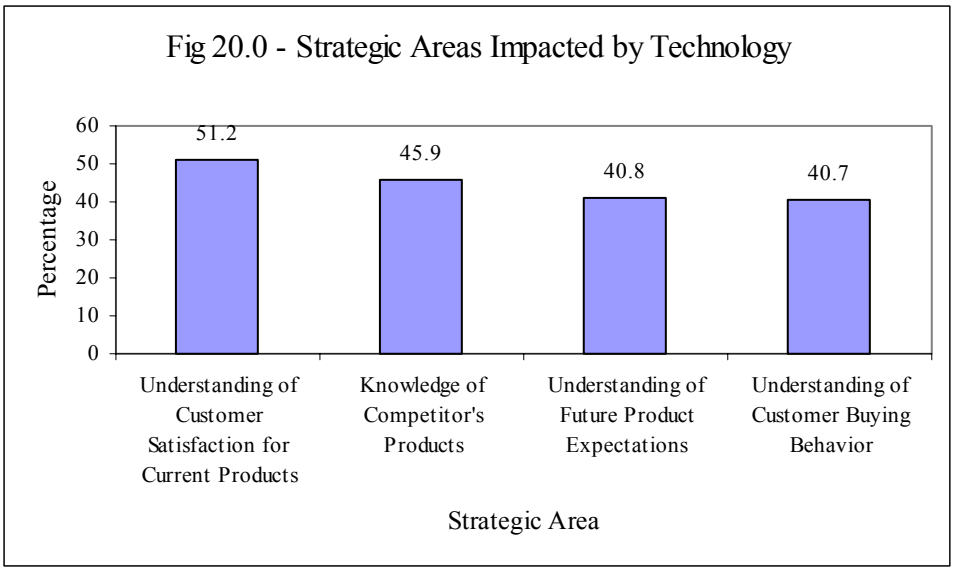


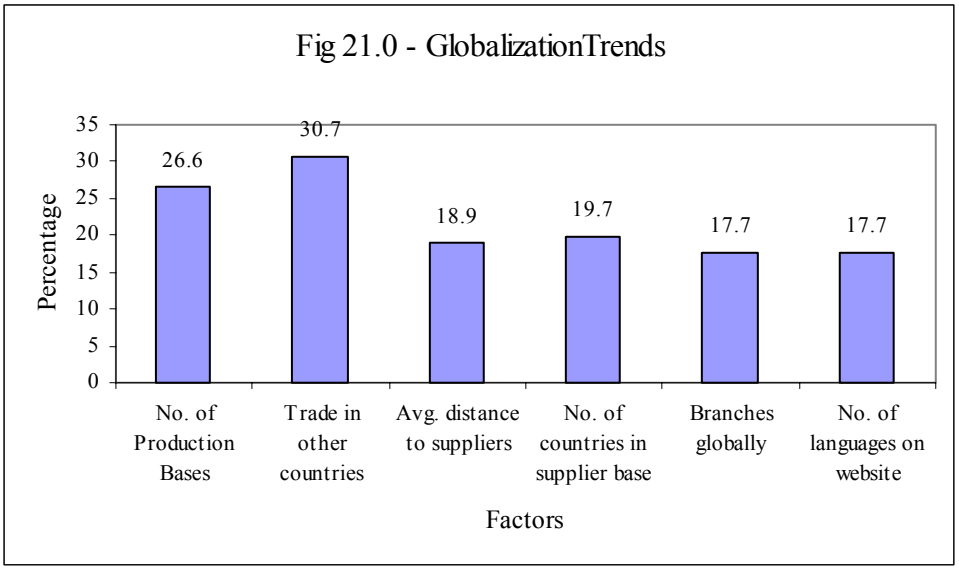
Fig 20.0 - Strategic Areas Impacted by Technology
Percentage
60
50
40
30
20
10
0
51.2
45.9
40.8
40.7
Understanding of Customer Satisfaction for Current Products
Knowledge of Competitor's Products
Understanding of Future Product Expectations
Understanding of Customer Buying Behavior
Strategic Area

Globalization

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

Organizations are increasing their geographic reach in terms of Trade in Other Countries (increasing or somewhat increasing in 30.7% of the organizations), Number of Production or Service Bases in other countries (increasing or somewhat increasing in 26.6% of the organizations), and the Number of Countries in the Supplier Base (increasing or somewhat increasing in 19.7% of the organizations). Increased average distance to suppliers, increase in Branches/Distribution centers globally and the Number of languages on the website and in brochures are the other factors considered.

These are shown in Figure 21.0 below.



Globalization in terms of the regions to which organizations have expanded or are planning to expand to is shown in Figure 22.0 below. Over a third (35.5%) of the organizations currently have or plan to have operations in Canada and Mexico (NAFTA); over a quarter (27%) have/plan to have operations in Western Europe and about a quarter have/plan to have operations in Latin America (24.2%) and South-east Asia (23%). Close to half the organizations do not plan to have operations in Africa (50.8%) or the Middle East (48.8%).

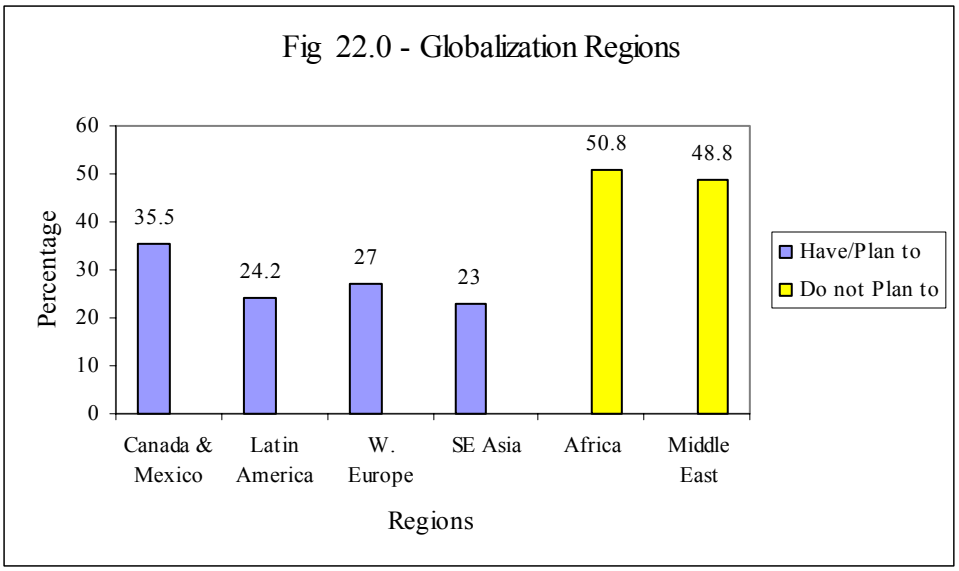


Fig 22.0 - Globalization Regions
Percentage
60
50
40
30
20
10
0
35.5
24.2
27
23
50.8
48.8
Canada & Mexico
Latin America
W. Europe
SE Asia
Africa
Middle East
Regions
Have/Plan to
Do not Plan to

Appendix A: Survey Methodology

The base line 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.

Major issues of interest were developed, which were then used to generate survey questions. The survey instrument was mailed to a database of over 24,000 individuals across all industry sectors in the United States and Canada. 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 on-line, 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	30.24%
Directors	32.66%
Managers	18.55%
VPs	8.47%
Officers	4.44%
No Response	5.65%

Size of organization in terms of

Annual revenues

Up to 100 million dollars annual revenues	27.82%
100 million to 1 billion dollars	29.84%
Over 1 billion dollars	10.48%
No response or Not Applicable	31.85%

Number of employees

Up to 200 employees	12.10%
200 to 1000 employees	43.55%
Over 1000 employees	39.11%
No response or Not Applicable	5.24%

IT Characteristics of organization in terms of

IT Budget as a percentage of annual revenue

Up to 1%	22.89%
1% to 5%	32.93%
Over 5%	13.25%
No response or Not Applicable	30.52%

Number of IT employees

Up to 10 IT employees	31.05%
10 to 50 IT employees	39.92%
Over 50 IT employees	23.79%
No response or Not Applicable	5.24%

Sectors of organizations North American Industry Classification System (NAICS)

Wholesale Trade	21.91%
Educational Services	15.25%
Retail Trade	10.17%
Government	9.32%
Finance and Insurance	8.05%

Healthcare & Social Assistance	7.63%
Professional, Scientific & Technical Services	5.51%
Information	4.66%
Construction	3.81%
Manufacturing	3.81%
Utilities	2.97%
Administrative & support, Waste Management & Remediation Services	2.97%
Other Services	2.12%
Transportation & Warehouse	1.27%
Arts, Entertainment & Recreation	0.85%
Accommodation & Food Services	0.42%

Appendix C: Current BIT Partners

UCLA Anderson School of Management, USA
Uday Karmarkar, Research Director CMIE, LA Times Chair Professor (Lead)
Dr. Vandana Mangal, Associate Research Director (Lead)
Uday Apte, Associate Professor, Southern Methodist University

Pontificia Universidad Católica de Chile, Chile
Sergio Godoy, Professor (Lead)

Theseus Institute, France
Francis Bidault, Professor/Deputy Director General (Lead)
Ahmet Aykac, Director

European Institute for the Media, Germany
Dr. Bertram Konert, Director of Research & Strategy (Lead)
Dr. Jo Groebel, Director-General

IIT Mumbai, India
Atanu Ghosh, Associate Professor (Lead)
Deepak Phatak, Chair Professor

SDA Bocconi, Italy
Andreina Mandelli, Professor, SDA Bocconi (Lead)
Alfredo Biffi, Professor, SDA Bocconi
Cinzia Parolini, Professor, University of Modena
Emilio Paolucci, Professor, Politecnico di Torino

Korea University Business School, Korea
Kwang-tae Park, Professor, Director, Service and Logistics Research Center (Lead)
Hosun Rhim, Associate Professor (Lead)

IESE Business School, Spain
Josep Valor Sabatier, Professor (Lead)
Sandra Sieber, Professor

World Internet Institute, Sweden
Dr. Johan P. Bång, Director (Lead)

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