



ICT as an Agent of Change
in Spanish Companies
Current Situation and Future Trends



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ICT as an Agent of Change in Spanish Companies

Current Situation and Future Trends

Authors of the study

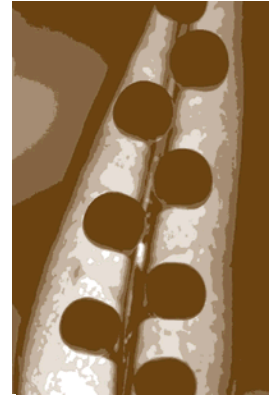
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Executive Summary

Information and Communication Technology (ICT) plays a key role in the process of economic transformation, and it also constitutes a vital source of competitiveness for our companies. Implementing ICT gives rise to changes within companies that affect a variety of organizational factors, from the way of producing to interaction with customers.

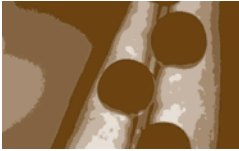
In order to analyze the impact of this transformation, the e-business Center PwC&IESE has undertaken the study entitled “ICT as an Agent of Change in Spanish Companies Current Situation and Future Trends”. Given the fact that ICT is present in the majority of business processes and that its implementation affect a wide range of business functions, our research attempts to distinguish the impact of ICT in different realms: adoption of technology and infrastructure, interaction with customers and suppliers, business results, and internal organization.

The primary goal of this study is to analyze the impact of and main challenges posed by ICT in the Spanish business sector, while at the same time comparing this information with the results in U.S. companies.

Technological infrastructure

Most of the Spanish companies (89%) have websites and carry out e-commerce transactions. However, the adoption of highly specific technologies is not yet widespread in Spain. Biometrics, for example, is only present in 3% of the companies in Spain.

In contrast, Spanish companies seem to be more likely to use RFID than U.S. companies. 32% of the companies in Spain claim that they plan to adopt this technology by 2007, compared to 21% in the United States, this technology is less widely used in the United States than in Spain.



Prime among the top concerns of Spanish executives and their U.S. counterparts is security. A full 81% of companies in Spain and 65% in the United States invest in security hardware and software. On the other hand, both countries have reined in their investments in on-demand computer services and outsourcing to third countries. In Spain, the budget earmarked for on-demand services has risen in barely 20% of the companies, while the proportion in the United States is even lower (15%).

Changes in the way of working

In Spain, the impact of ICT on companies' internal organization is especially interesting, since although companies have undergone profound changes in the way of working, the impact of ICT on their organizational structures is rather scant, unlike in U.S. companies.

Spanish companies have experienced a significant transformation in employees' working patterns: 87% of companies acknowledge the importance of workers' ICT skills. However, the impact on organizational structure is more diluted, and strong hierarchies remain prevalent.

In the United States, on the other hand, ICT seems to have contributed to achieving more horizontal organizations. More than half the U.S. companies (54%) claim that their organizations are increasingly flat, while geographic dispersion is on the rise, contributing to making companies' internal organization more flexible.

Greater customer orientation

Interactions with customers have also been affected by ICT. 36% of the Spanish companies and 35% of the U.S. companies use online technologies to keep in contact with customers. These percentages are higher than those registered for direct (including face-to-face) contact, which is used by 18% of companies in Spain and 21% in the United States.

The most automated process within customer relationship management in Spanish companies is order tracking and delivery: 68% have systematized this function, while orders can be placed automatically in 66% of the companies.



When contrasting the differences between online and traditional business, it is clear that ICT has contributed to increasing the actions undertaken by users during the purchasing process; indeed, 55% of the Spanish companies claim this to be so. 74% of the companies charge similar prices for products sold through both online and traditional channels, which indicates that ICT has not contributed to price cuts.

Communication with suppliers mainly takes place via EDI, although this software is more widely used in Spain (65%) than in the United States (45%). However, communicating via XML is still more popular in U.S. than in Spanish companies (43% vs. 37%).

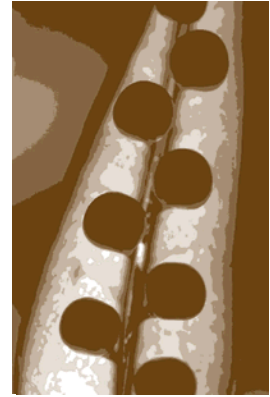
Scant impact on business margins

There is a widespread expectation that implementing ICT in businesses provides economic benefits; however, the results from the study indicate that the impact of ICT on revenues and margins has not been very significant. In the vast majority of companies, introducing the use of ICT has not led to significant changes in their results, which would indicate that these profits are often generated in the middle term. What is more, almost half the Spanish companies have been forced to increase their investments in technology and in consultancy and collaboration services.

Overall, 64% of the companies claim to have reduced their production costs, while 55% have lowered their investment in internal communication.

Finally, ICT has served to open up channels of communication with customers, which in turn enables competitors in a given sector to study each other more keenly.

In conclusion, although we can discern the significant impact of information and communication technology on both Spanish and U.S. companies, our study leads us to believe that executives in both countries expect even greater results from the money they have been investing in technology in recent years.



Introduction

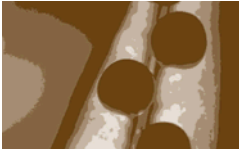
To date, information and communication technologies (ICT) have experienced a spectacular growth rate. According to IDC, global investment in ICT in the past forty years has risen from 2,000 million dollars to 900,500 million dollars.

Lately this growth rate has slowed down. For example, Forrester estimates that this year (2005) in the United States, investment in ICT – which encompasses personnel; external services; telecommunications equipment, PCs, servers and storage; and software, both licenses and maintenance – will rise at a modest rate of 7%. Nevertheless, markets such as external services will continue to experience two-digit growth rates of up to 27%.

What is clear, however, is that nowadays, ICT has a massive presence in companies, backed by information systems to increase their efficiency and productivity. For many companies, technology has become a tool for achieving their strategies. In fact, a recent study from the U.S. pointed out that more than 60% of the companies in that country define their technological infrastructure as a factor that differentiates them from their rivals.

In Spain, the situation is somewhat different. According to the market analyst Penteo, the importance of ICT in companies is on the wane. This firm claims that only 27% of companies in Spain regard technology as key. Despite this, almost half of Spanish companies define information systems as being essential.

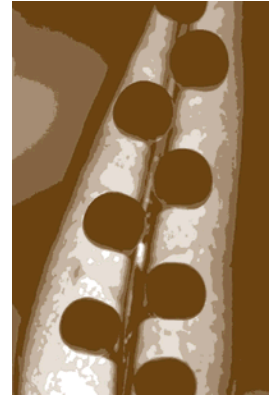
Thus, information systems have become a key factor in company competitiveness. As a result, it is important to understand what executives look at when investing in IT. With the purpose of shedding light of the status of technology in Spanish companies, we have undertaken a study that analyzes six basic dimensions in the ICT – company strategy relationship: Technology Adoption/Infrastructure; Forward (Customer) Facing; Trading Partners; business results; and internal organization (Management and Workplace Issues, and Business



Process Outsourcing). Analyzing these factors has enabled us to devise an X-ray of the situation of ICT on the Spanish business scene in an attempt to gain further insight into Spanish executives' behavior with regard to IT expenditures.

However, this research has also provided us with the opportunity to compare the behavior of IT decision maker in Spain with their U.S. counterparts. Our study is in fact the Spanish chapter of a worldwide research project being spearheaded by the University of California at Los Angeles (UCLA). The project, which analyses the impact of the new information and communication technologies on business practices, is known as the BIT (Business Information Technologies) project. IESE Business School – Universidad de Navarra is the management school chosen to carry out this study in Spain, a project that has arisen from the desire to promote continuity and with the collaboration of prominent business schools all over the world. The study is also being conducted in Chile in conjunction with the Pontificia Universidad Católica de Chile; in France through the Theseus Institute; in Germany along with the European Institute for the Media; in India in association with IIT Mumbai; in Italy via SDA Bocconi; in Korea under the leadership of the Korea University Business School; and in Sweden through the World Internet Institute.

The objective of the first edition of the BIT, sponsored by the e-business Center PwC & IESE, is to obtain an indicator that enables us to describe the changes that companies and industrial sectors all over the world have experienced in recent years with the introduction of new technologies, as well as to predict the future evolution of these technologies.



Methodology

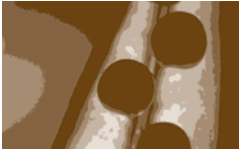
The BIT study has been conducted by a survey addressed to different organizations belonging to a wide range of sectors in industry. All of the companies make independent decisions on issues related to information technology systems, and each of these companies has a CIO (Chief Information Officer) or a person in a similar position. Given the fact that these individuals make the decisions on investment in new technologies within the company, it is highly likely that they also have a certain degree of responsibility in terms of the organization's profits and losses (although this does not always hold true). The surveys were addressed to the CIOs.

One of the reasons why a survey was used (instead of interviews, case studies or direct data gathering) was the possibility of encompassing a greater number of sectors within industry. Studying the impact of the new technologies in a larger swath of sectors leads to a greater understanding of the phenomenon. Of course, the impact of information technology is closely related to the nature of each industry, and the survey is being supplemented with studies on a sector-by-sector basis.

The survey was sent to 5,567 companies from different industrial sectors in Spain. Between June and September 2004, a first wave of surveys was sent to the 250 leading Spanish companies in terms of turnover. Between October 2004 and April 2005, a second wave consisting of 5,317 surveys was sent to Spanish companies of all sizes.

The data were gathered from 95 Spanish companies. The CIOs were asked to fill out the survey by e-mail, fax or through an online form.

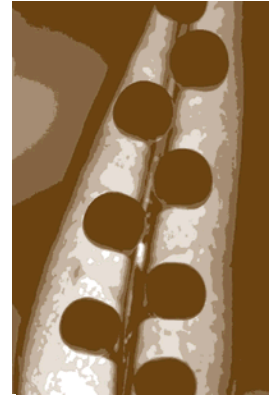
The questionnaire used in the Spanish chapter of the BIT is based on the questions developed by UCLA, with the appropriate adaptations to the situation in Spain. The questions were generated after identifying the issues that were



regarded as the most interesting and important to research. These issues were framed within specific hypotheses that could be confirmed or refuted through the responses to the study. The companies profile is presented in Table 1.

Table 1. Companies Profile

Annual revenue	Percentage
Less than 10 million euros	13
Between 10 and 100 million euros	10
Between 100 and 300 million euros	7
Between 300 million and 1,000 million euros	8
More than 1,000 million euros	16
No answer	46
Percentage of revenue spent on ICT	Percentage
Less than 1%	21
Between 1% and 5%	33
Between 5% and 10%	5
Between 10% and 40%	11
More than 40%	2
No answer	28
Number of Employees	Percentage
Fewer than 200	25
Between 200 and 600	13
Between 600 and 1,000	4
Between 1,000 and 5,000	24
Between 5,000 and 30,000	8
More than de 30,000	6
No answer	20
Number of ICT Employees	Percentage
Fewer than 20	42
Between 20 and 50	18
Between 50 and 100	9
Between 100 and 250	6
More than 250	3
No answer	22
Sectors to which the companies belong (multiple choice)	Percentage
Manufacturing	27
Services	58
Physical Products	17
Information products	14
Consumer	8
Corporate	23



1. The Situation of ICT in Spanish Companies

1.1. Adoption of technology and infrastructures

Currently, the main technologies that Spanish companies are websites and e-commerce, Groupware/Productivity Tools (such as Lotus Notes), and Enterprise Resource Planning (ERP) systems.

Specifically, as shown in Figure 1, 89% of the companies use websites and e-commerce, while 85% have Groupware/Productivity Tools, 79% of Spanish companies make use of enterprise resource planning systems.

Although digital receipts and business process modeling tools are currently not very widespread in Spanish companies – only 28% use them – within the next three years another 28% of the companies plan to acquire technology for digital receipts, and 29% claim that they are to implement business process modeling tools.

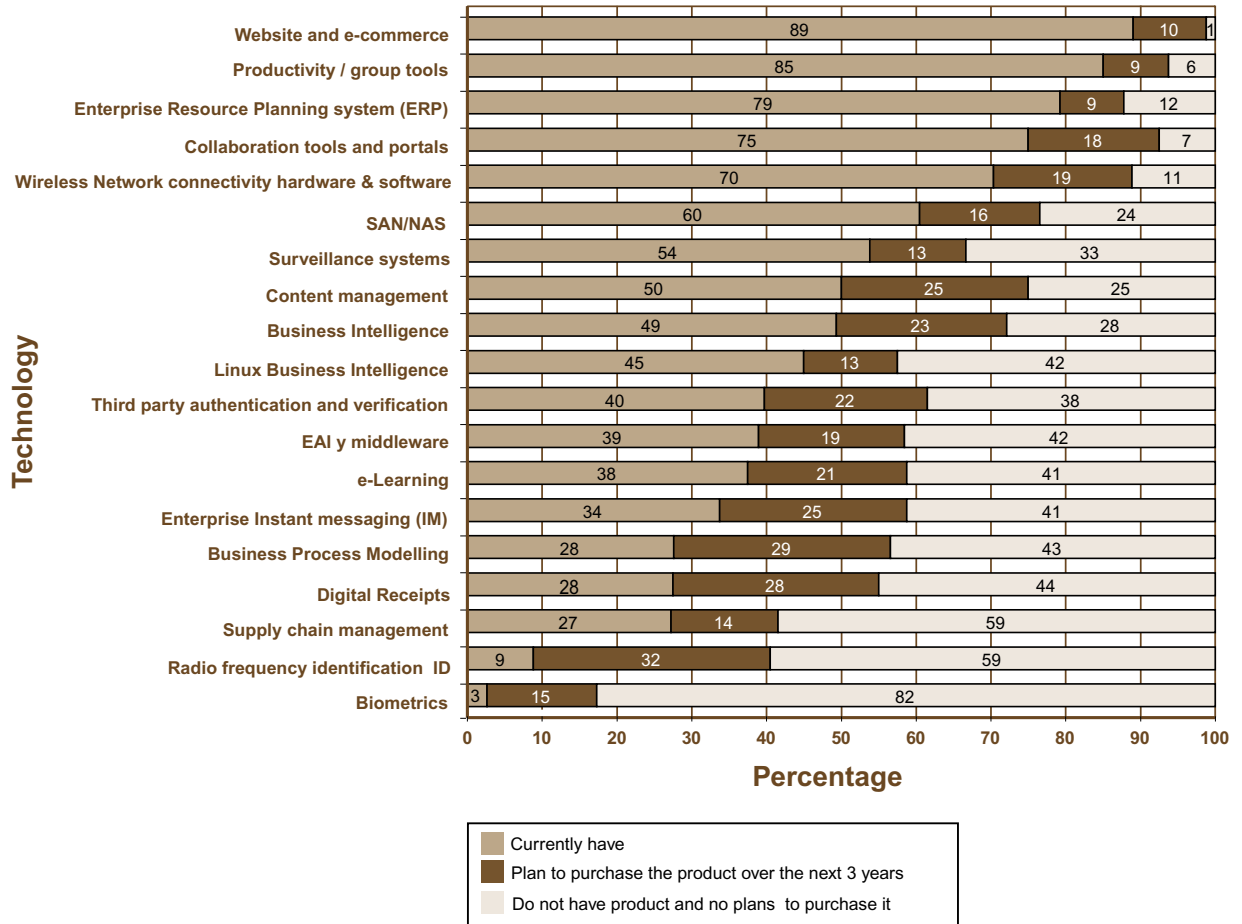
On the other hand, only 9% of the companies surveyed use radio frequency identification (RFID), although 32% state that they plan to do so within the next three years. The technology that has been adopted the least among Spanish executives is biometrics¹: only 3% of the companies use it, and a little 15% plan to purchase this technology in the near future. 82 % of companies currently lack this technology and have no plans to purchase it.

If we compare the situation of technology in Spanish companies in 2004 with the situation forecast by the same executives for 2007 (see Figures 2a and 2b), it becomes clear that websites and e-commerce will continue to be the most popular technologies, followed by productivity and group work tools. However,

1. Biometric technology involves using a personal characteristic as a password; that is, it entails identifying individuals through some physical feature (digital fingerprint, the iris, voice).



Figure 1. Adoption of technologies and infrastructure



enterprise resource planning systems will fall from third to fifth place on the list of most widely adopted technologies. Thus, the use of this technology is currently so widespread that it is already reaching its ceiling.

ERP is the tool that the companies have been using for the longest time; on an average, the Spanish companies have had this technology for seven years. Thus it is logical that it is reaching its maximum penetration point.

Finally, the use of collaboration tools and portals is expected to increase until they are implemented in more than 90% of the companies. The same holds true



with wireless network connectivity hardware and software, which will experience a 23% increase. This growth is considerable if we bear in mind that the Spanish companies have had these technologies for a relatively short time: an average of three and two years, respectively.

Figure 2a. Technology/Infraestructure: 2004

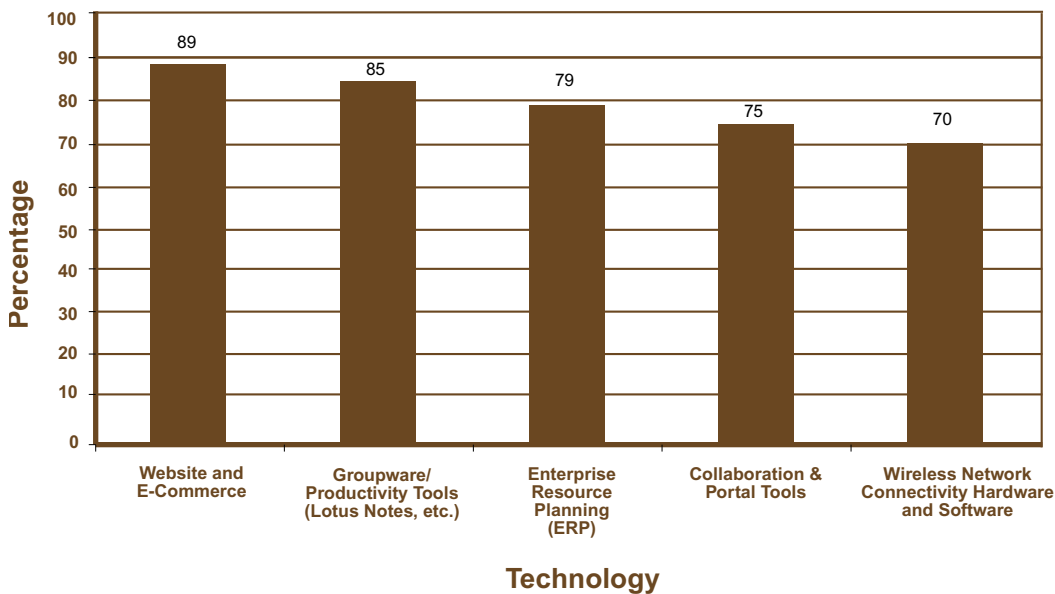
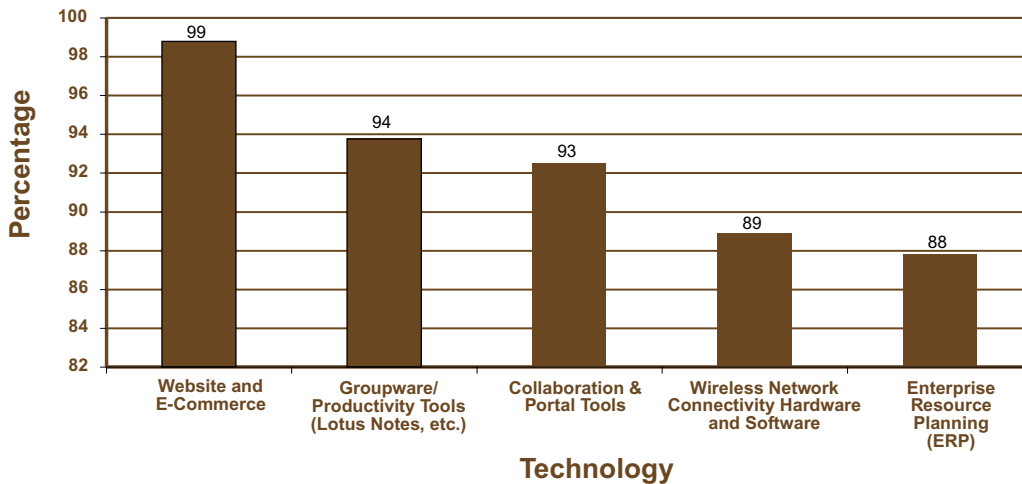
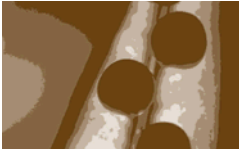


Figure 2b. Technology/Infraestructure: 2007





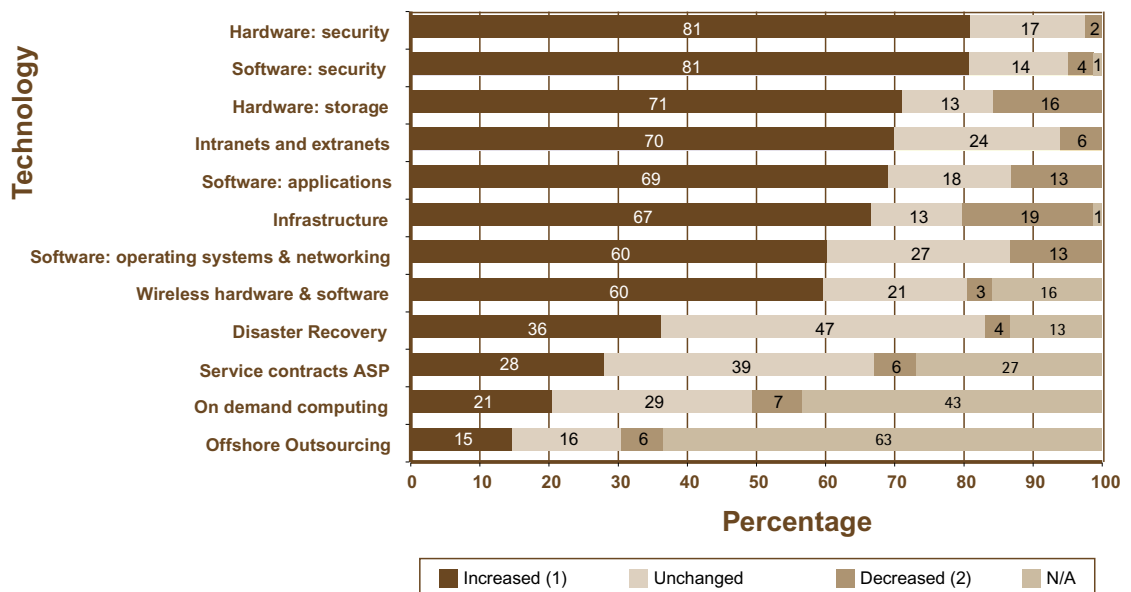
Budget trends

The IT budget item that has risen the most in the past three years is hardware and software security: more than 80% of the companies responding to the survey confirmed the growth in expenditures earmarked for both types of technology (see Figure 3). In contrast, the most stable factor is disaster recovery, and almost half the companies (47%) have not changed their investments allocated for this.

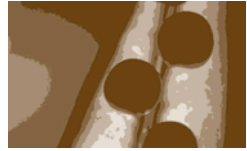
Likewise, investments in infrastructure are the line item that have experienced the greatest cuts in the past three years: almost 20% of the Spanish companies have lowered their spending on this, while hardware storage costs have also gone down by 16% in the companies surveyed.

Finally, the budget earmarked for outsourcing services to third countries (offshoring) and on-demand computer services are the ones that have increased the least in the past three years.

Figure 3. Budget trends (past 3 years)



(1) Under this category, the answers "increased" and "significantly increased" are grouped together.
(2) Under this category, the answers "decreased" and "significantly decreased" are grouped together.



1.2. Internal organization

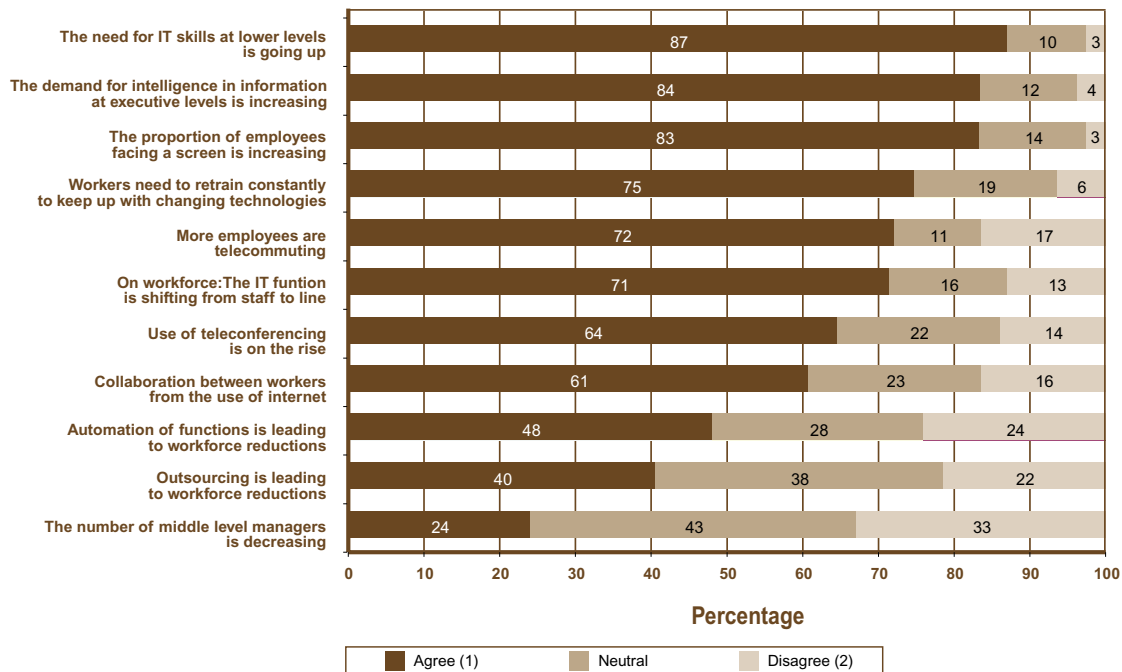
The issue of the impact of ICT on the internal organization of companies is broached from two perspectives: the standpoint of work and management and the standpoint of outsourcing processes.

Issues related to work and management

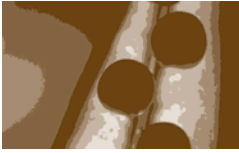
In terms of the impact of technology on work and management (see Figure 4), almost 90% of the companies agree (27% strongly agree and 60% agree) with the need to increase IT skills at the lower levels in the organization. No less important for 84% of the companies is the impact of IT on the demand for intelligent access to information at an executive level.

A full 83% of the companies surveyed claim that the proportion of employees working in front of a computer has risen, while 75% believe that ICT has generated the need to retrain workers, and 72% believe that the number of telecommuters has increased.

Figure 4. Impact of the technology on Internal Organization Workforce in the last years



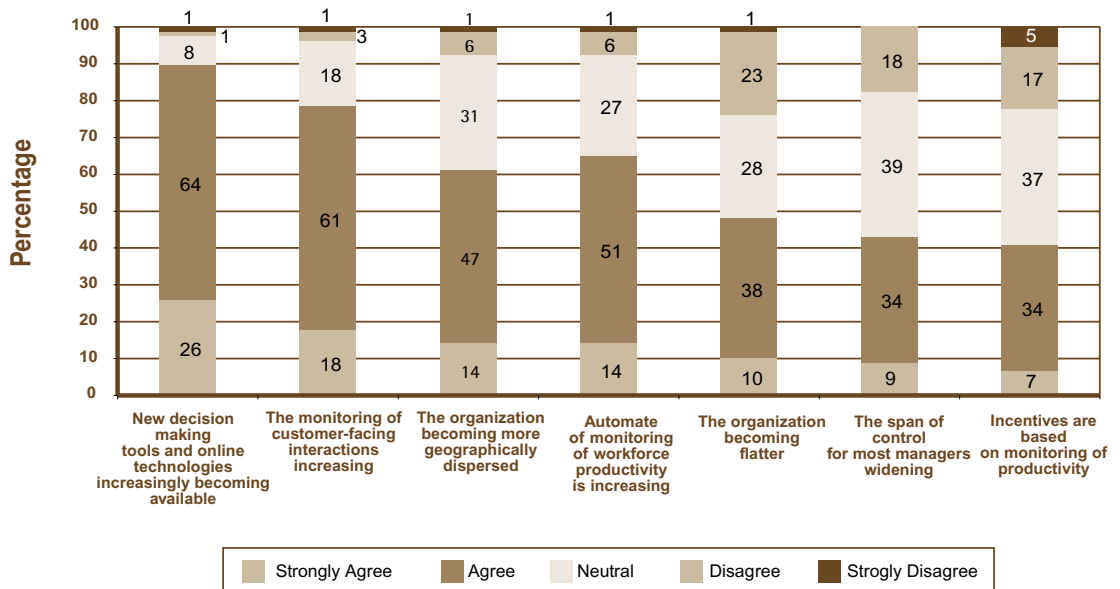
(1) Under this category, the answers "agree" and "very much agree" are grouped together.
(2) Under this category, the answers "disagree" and "very much disagree" are grouped together.



These results corroborate the fact that implementing ICT in the workplace is transforming the way work is being done. However, the results of this survey indicate that organizational structures themselves have not been significantly affected, in that the organization is not more horizontal than before. In fact, only 24% of the companies responded that ICT has generated a reduction in middle-management positions, compared to 33% that have not noticed such a reduction. Likewise, 22% and 24% of business people do not agree that subcontracting and automation, respectively, have translated into smaller staffs.

The results on the impact of technology on company structure (see Figure 5) also indicate that the number of staff members supervised by a single executive has increased. Forty-three percent of respondents agreed with that statement, and 24% of the companies expressed their disagreement with the claim that ICT have led to a more horizontal organization.

Figure 5. Impact of Technology on Structure





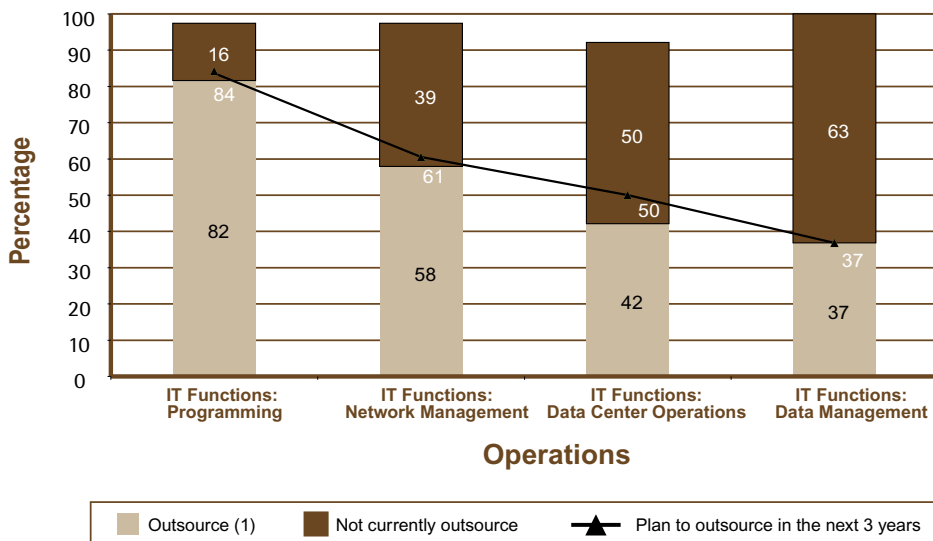
However, in terms of the impact on company structure, 90% of the respondents believe that ICT has increased the availability of new tools for decision-making and online technology, while 78% claim that the monitoring of interaction with customers is enhanced. Thirty-seven percent of companies responding claimed neutrality on the idea that incentives are based on monitoring productivity.

Issues related to outsourcing processes

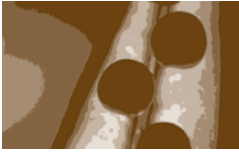
Outsourcing business processes is yet another factor that has influenced companies' internal organization. Among the processes related to ICT, programming (85%) and network management (58%) are currently the processes that are most often outsourced.

Data management, on the other hand, is the ICT process that is outsourced least often, but it seems to have reached it ceiling: 63% of the companies have not yet outsourced it, and none plan to do so within the next three years.

Figure 6. Outsourcing of Processes related to ICT



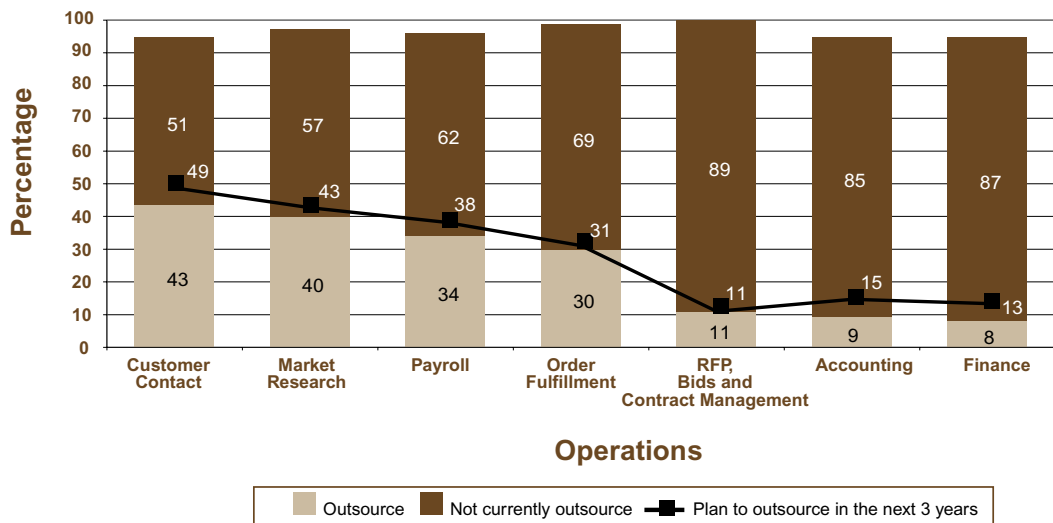
(1) Under this category, the answers "partially externalized" and "significantly externalized" are grouped together.



In the next few years (see Figure 6), programming will continue to be the most widely outsourced process in companies, with a rate of 84% predicted for 2007, followed by network management in 61% of the companies.

In terms of processes not directly related to ICT, customer contact and market research are the processes that are most frequently outsourced. Although accounting and finances are currently the areas that are least often outsourced (8%), the study stresses the fact that by 2007, 13% of the companies plan to outsource these services, which would mean a 67% increase over the 2004 rate.

Figure 7. Outsourcing of Processes not related to ICT



The least often outsourced process not related to ICT is RFP (requests for proposals): 89% of companies handle this internally. Thus, as a whole, processes related to ICT are more frequently outsourced than processes not related to technology.

In general, the sums earmarked for outsourcing ICT processes are quite low (see Figure 8). Sixty percent of the companies surveyed allocate a minuscule percentage to this area, namely less than 1% of their sales revenues, and only 4% spend more than 20% of their revenue.



As for processes not related to ICT, the results are different, and companies tend to earmark a higher proportion of revenue to outsourcing this type of processes. To wit, 11% of the companies surveyed earmark more than 20% of their sales revenues to outsourcing processes not related to ICT, a percentage that is quite high compared to the 4% of companies that do so for ICT processes.

Figure 8a. Budget Earmarked for Outsourcing related to IT

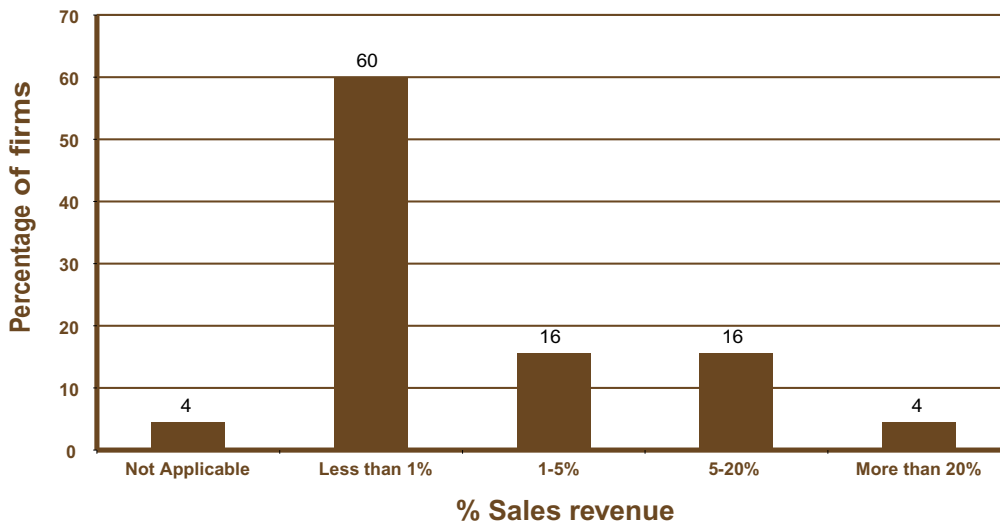
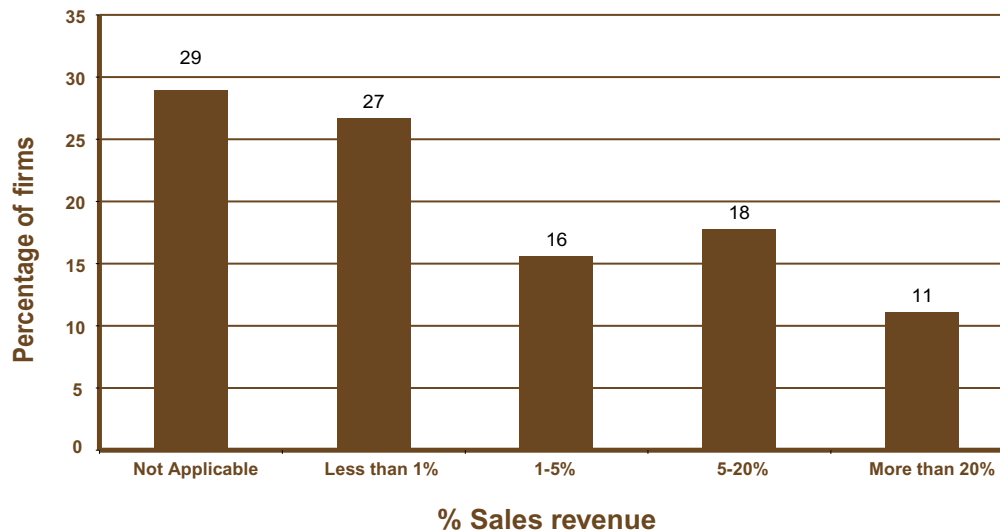
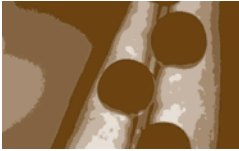


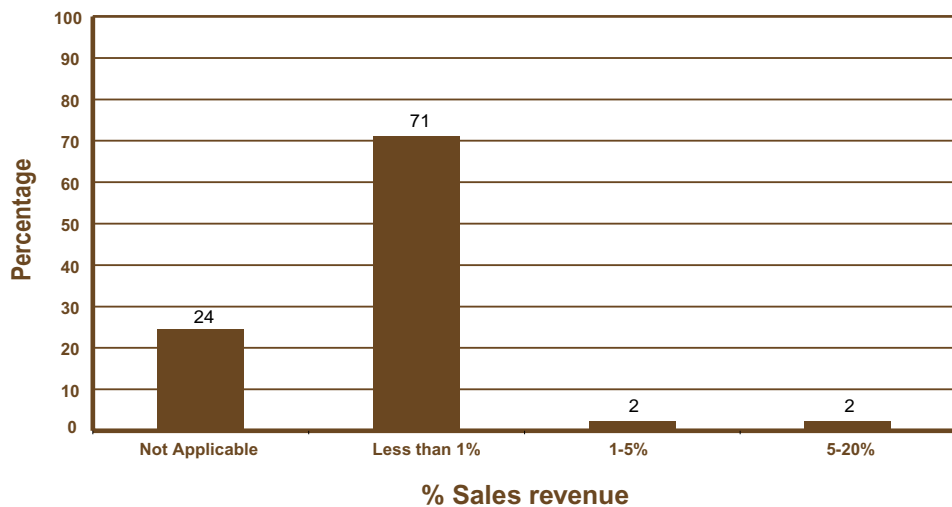
Figure 8b. Outsourcing Budget as a Percentage of Sales Revenue: Not related to IT





The amount budgeted to outsourcing in countries with lower costs (offshoring) is quite low, in that 71% of the companies earmark less than 1% of their sales revenues for this (Figure 8c).

Figure 8c. Budget Earmarked for Outsourcing to Countries with Lower Costs



1.3. Interaction with customers

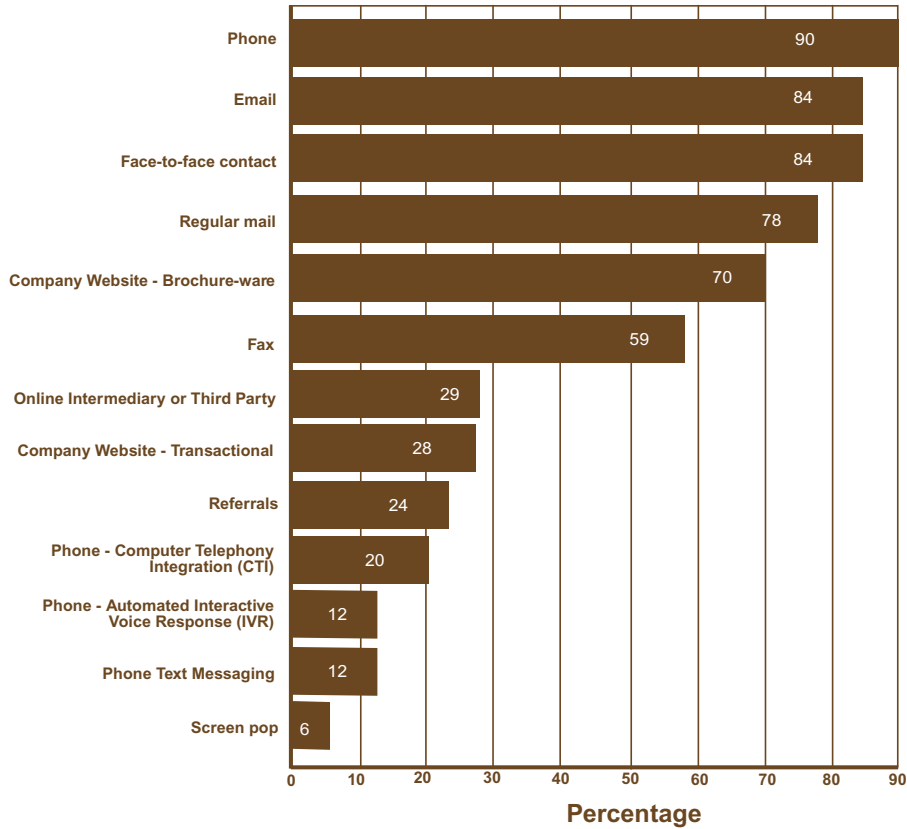
The customer contact point most commonly used by companies continues to be the telephone (90%). In second place is e-mail, used in 84% of companies surveyed. Despite this, the companies continue to use direct contact with their customers. Indeed, 84% of the companies still use face-to-face contact often (see Figure 9).

The least popular technologies are telephone text messaging (12%), automated interactive voice response (12%) and screen pops (6%).

By grouping the customer contact points into four categories, we can more clearly see whether or not the companies use the new technologies to contact their customers. These groups are: online technologies, other technologies, direct points of contact, and other points of contact. Online technologies encompass e-mail, online catalogues, online transactions, online intermediaries or third parties, and screen pop-ups. Other technologies include telephone,

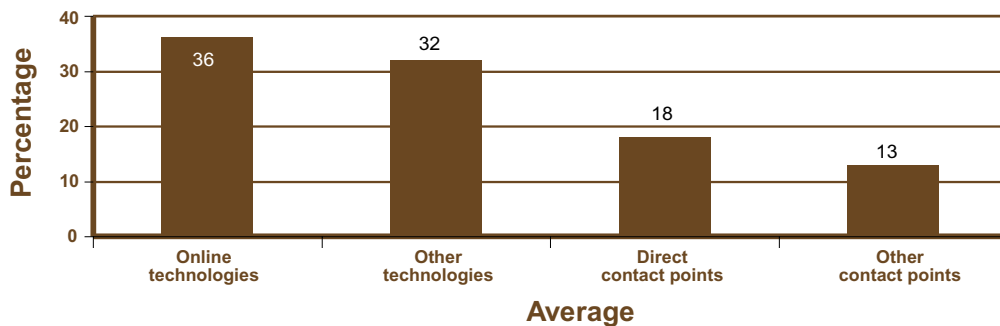


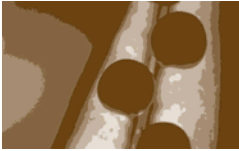
Figure 9. Customer Contact Points



fax, automated interactive voice response, computer telephony integration and phone text messaging. Direct points of contact refer to face-to-face contact and

Figure 10. Customer Contact Points





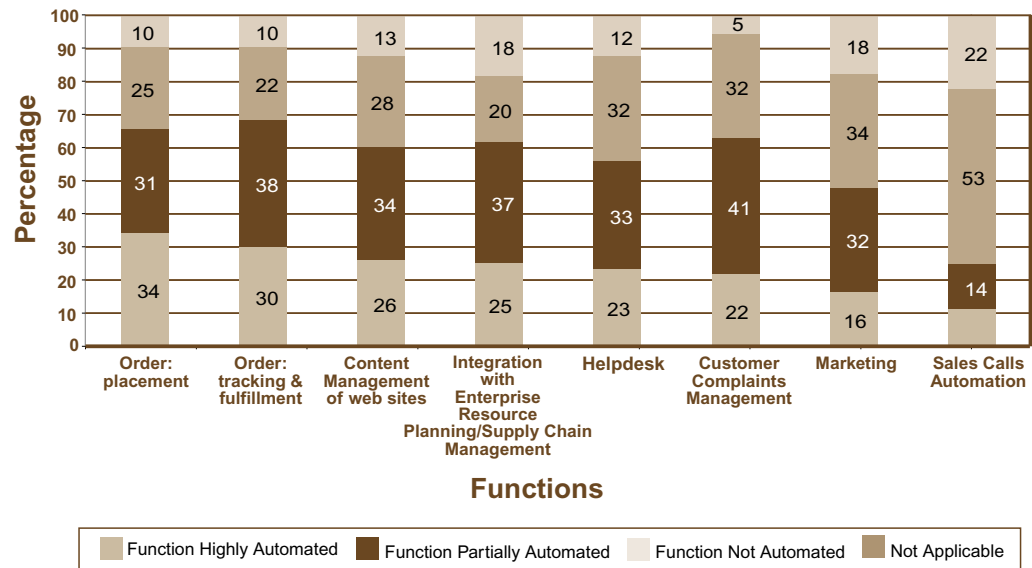
referrals. Finally, other points of contact are the traditional paper-based mails. Following these groupings, online technology is the most widely used (36%), while the regular mail is least widespread in the companies surveyed (13%) (see Figure 10).

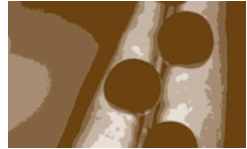
Customer Relationship Management (CRM)

The most frequently automated process of CRM in Spanish companies is order tracking and fulfillment: 68% have this function systematized (30% have it highly automated and 38% partially). This is followed by placing orders in 66% of the companies (34% have this function highly automated and 32% partially systematized) (see Figure 11).

The functions that are most often carried out manually are sales phone calls and marketing: 53% of the companies have not automated their sales phone calls, and 34% for marketing functions.

Figure 11. Automation of CRM Function

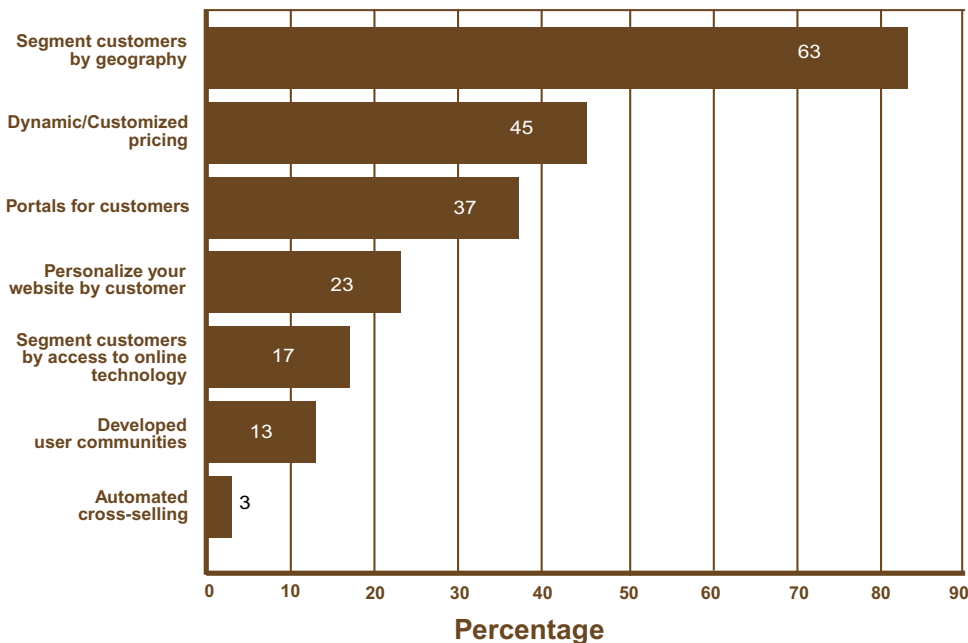




Mechanisms for customer segmentation and data analysis

The majority of Spanish companies segment their markets by geographical areas and prices, two highly traditional formulas. Along these lines, the executives claim to rarely use customer portals, personalization of websites and segmentation according to access to online technology. Thus, it could be claimed that ICT has not yet become a popular tool for market segmentation (see Figure 12).

Figure 12. Mechanisms for customer segmentation



As shown in Figure 13, the technologies most often used to analyze customer data are customer profiles (65%), data marts and data warehousing (55%) and data mining: statistics (54%), and demand forecasting (52%).

The least popular technologies in customer data analysis are fraud detection and data mining: neural networks.

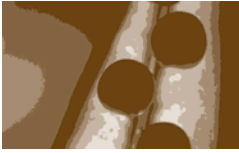
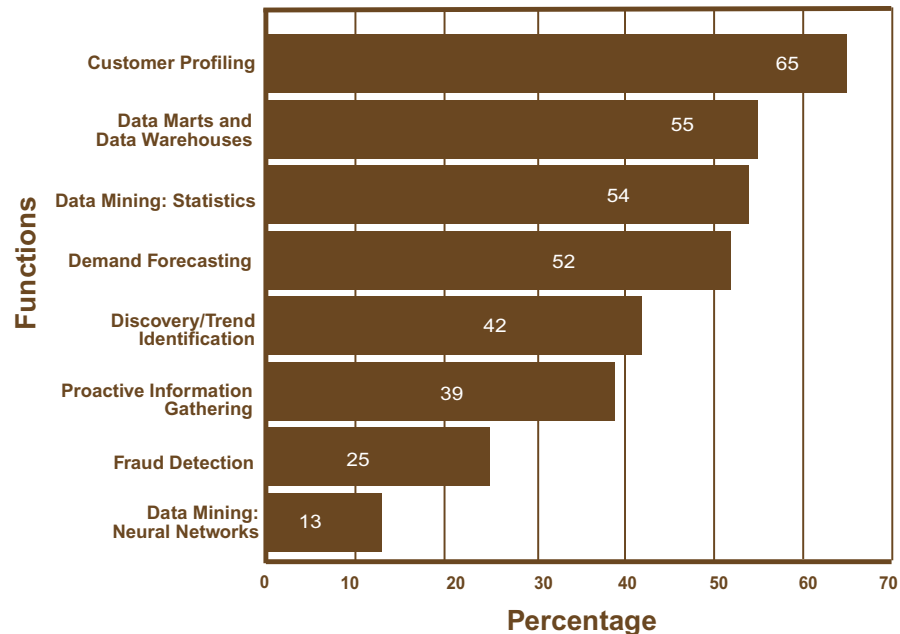


Figure 13. Customer Data Analysis



Product sales channels

The Spanish companies surveyed used both the traditional product sales channels as well as online sales. Twenty-two percent of the companies continue to sell only via the traditional channel, while 75% use both traditional and online sales (see Figure 14).

Nevertheless, none of the companies in the sample sell solely online, and only 4% of the companies sell some of their products and services online.

Online advertising

Most of the online advertising methods are widely used in Spanish companies.

Pop-ups do not seem to be very popular among Spanish companies, with only 24% of the survey respondents using them to advertise. Web seminars (Webinars) are the method least often used (16%) (see Figure 15).



Figure 14. Product Sales Channels

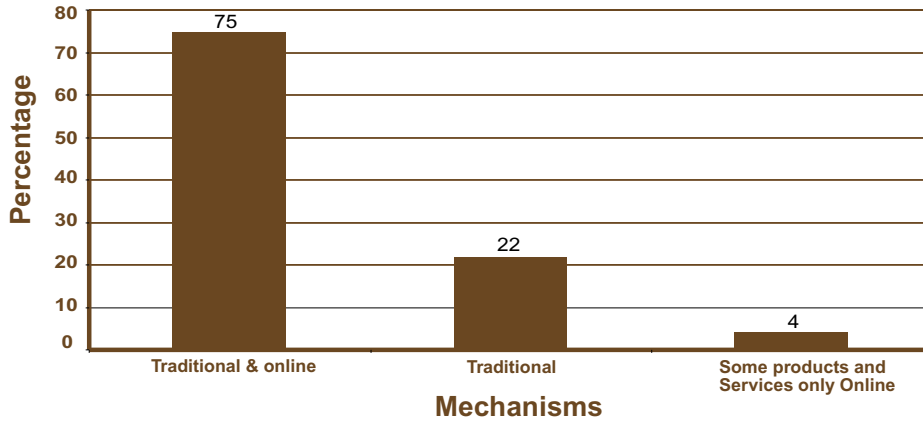
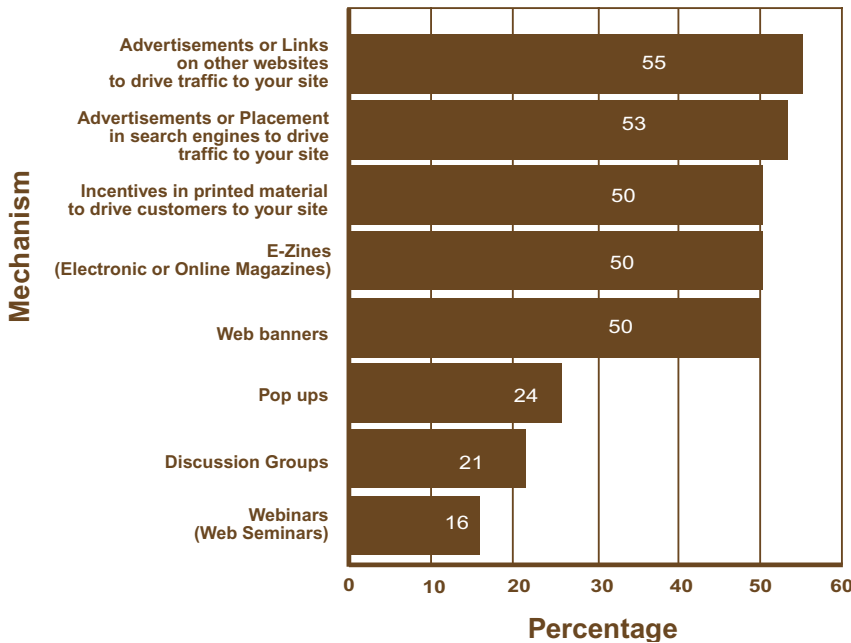


Figure 15. Online Advertising Methods (multiple choice)



Online versus traditional business

The implementation of ICT in companies has not led to significant changes in their corporate images: 91% of the companies surveyed have kept the same brand concept in the online and offline environments, 89% have not modified their logo and 86% have not modified either their slogan or their name, as see in Figure 16.

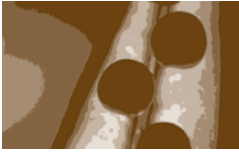
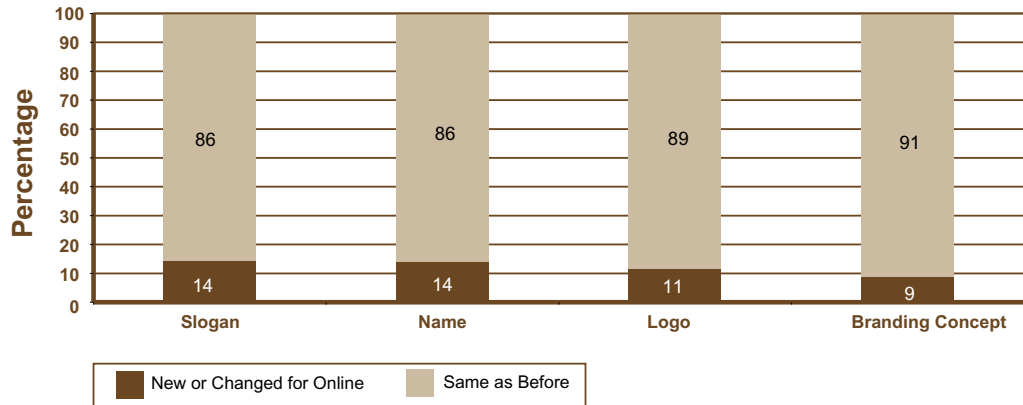
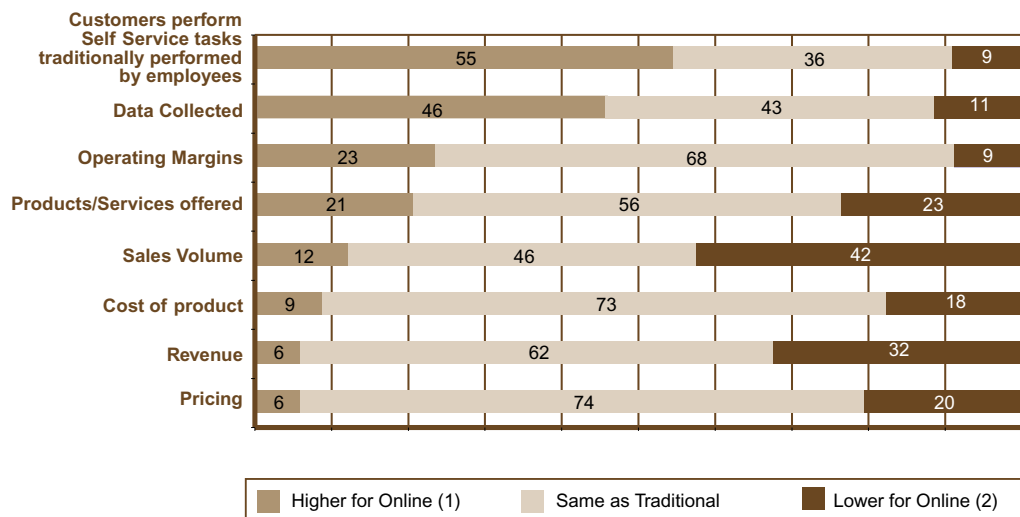


Figure 16. Corporate Image



When comparing the online and traditional settings, the companies believe that both tasks by users and data collection have increased in the former, although the volume of online sales is still lower (see Figure 17).

Figure 17. Business Results Online Vs Traditional



(1) Under this category, the answers "a lot higher for online" and "somewhat higher for online" are grouped together.
(2) Under this category, the answers "a lot lower for online" and "somewhat lower for online" are grouped together.



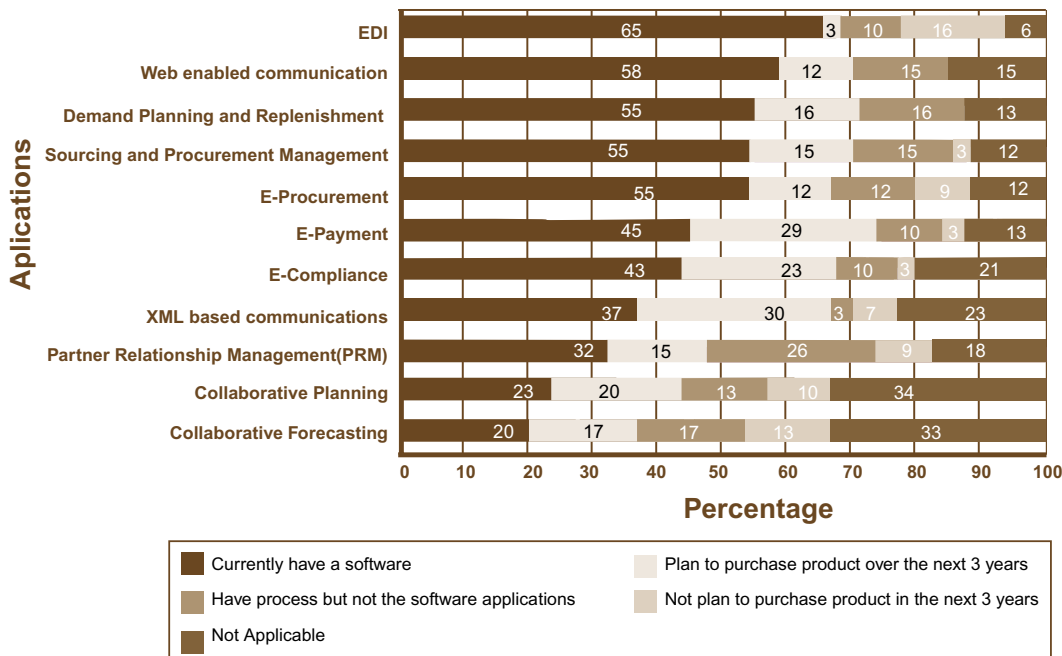
However, the results of online and traditional business seem to be quite similar, in that for 74% of the companies, prices and production costs are the same for both types of business. Thus, operating margins and income in both types of business do not differ substantially: for 68% of the companies, these margins are identical.

1.4. Trading Partners

Most of the companies use some type of software to communicate with their suppliers, such as EDI (65%), web enabled communication (58%), and Demand Planning and Replenishment (55%) (see Figure 18).

The 26% claimed not to use any software to manage supplier relationships, and 17% lack solutions for collaborative forecasting.

Figure 18. Communication with Trading Partners





By analyzing the forecasts for 2007, it can be seen that 74% of the companies plan to systematize electronic payment, a tool that is extremely underused at this time (see Figure 19).

EDI will fall from being the leading application to fifth place in 2007, while electronic payment will shift from being used in 45% of the companies to 74%. The fall in EDI is due to the relatively high percentage of companies (16%) that do not plan to purchase this application within the next three years.

Figure 19a. Applications of software used in 2004

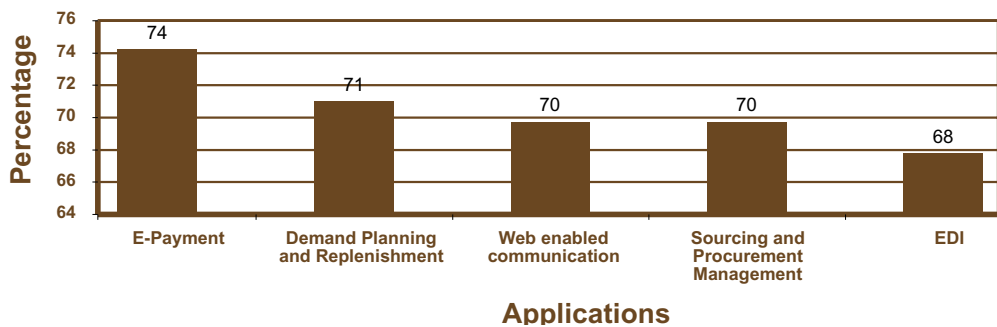
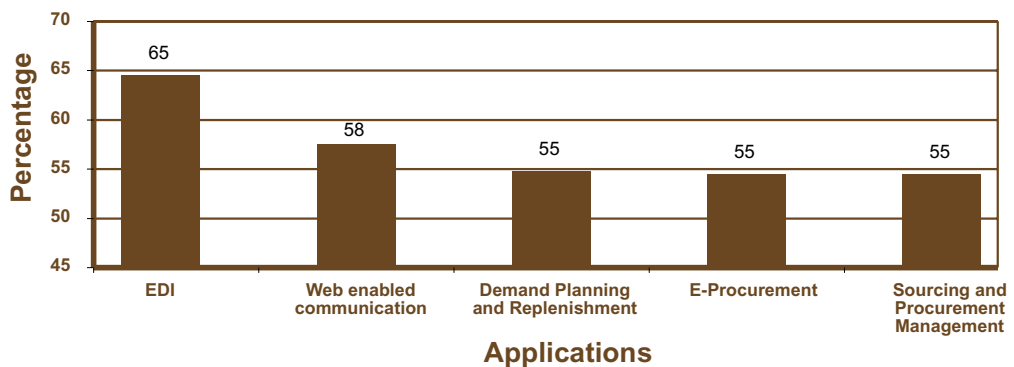


Figure 19b. Applications of software used in 2007



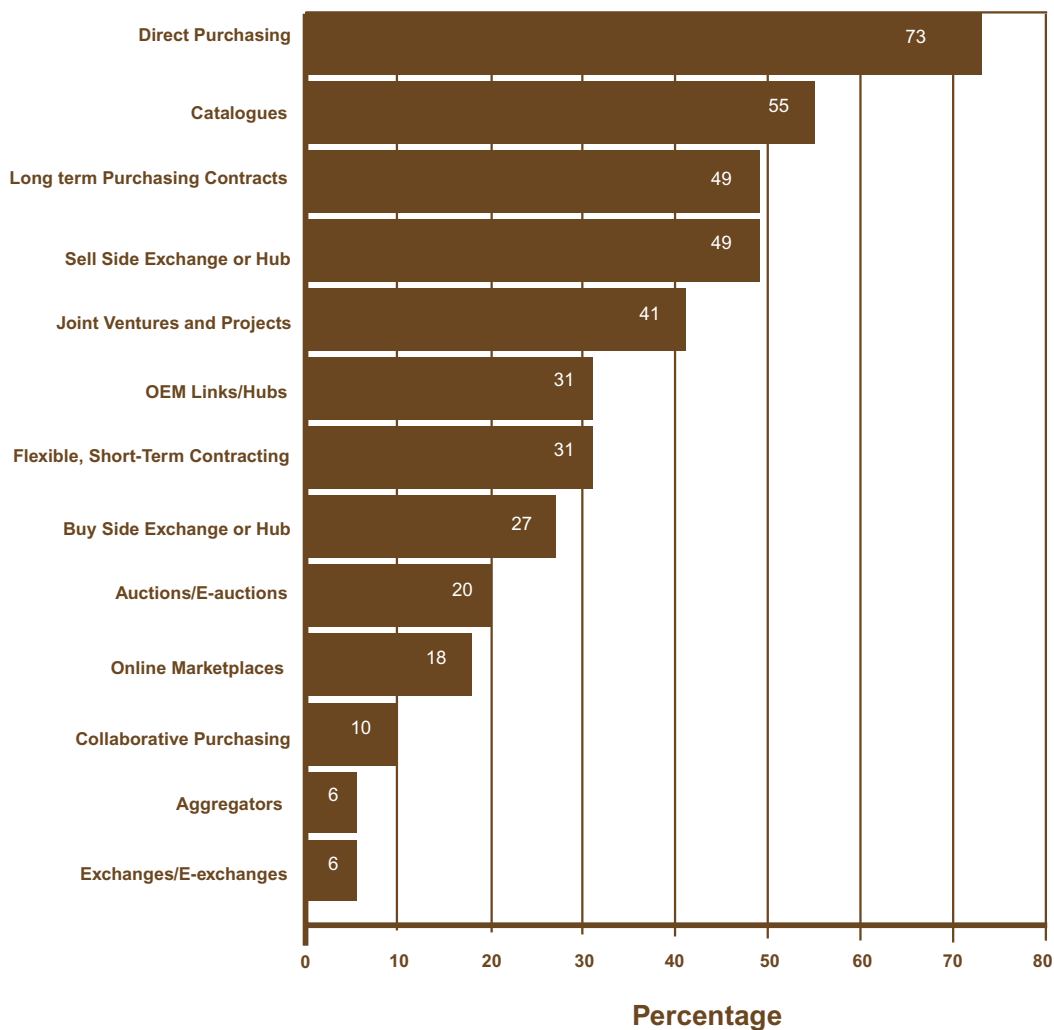
Likewise, electronic procurement will cease to be among the top applications, although it will experience 22% growth. The application that will experience the steepest growth between now and 2007 is collaborative planning, although it will remain toward the bottom of the list.

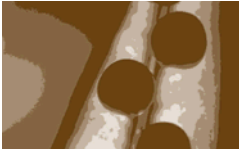


B2B mechanisms

The main procurement mechanism is direct purchasing, used by 73% of the companies. More than half of the companies surveyed (55%) use catalogues as a B2B mechanism in the purchasing process. This is followed by long-term purchasing contracts and the electronic supplier market (49%). These data shed light on the fact that the companies are implementing ICT in their relationships with suppliers. The least widespread mechanisms are demand aggregates and exchange markets.

Figure 20. B2B Mechanisms





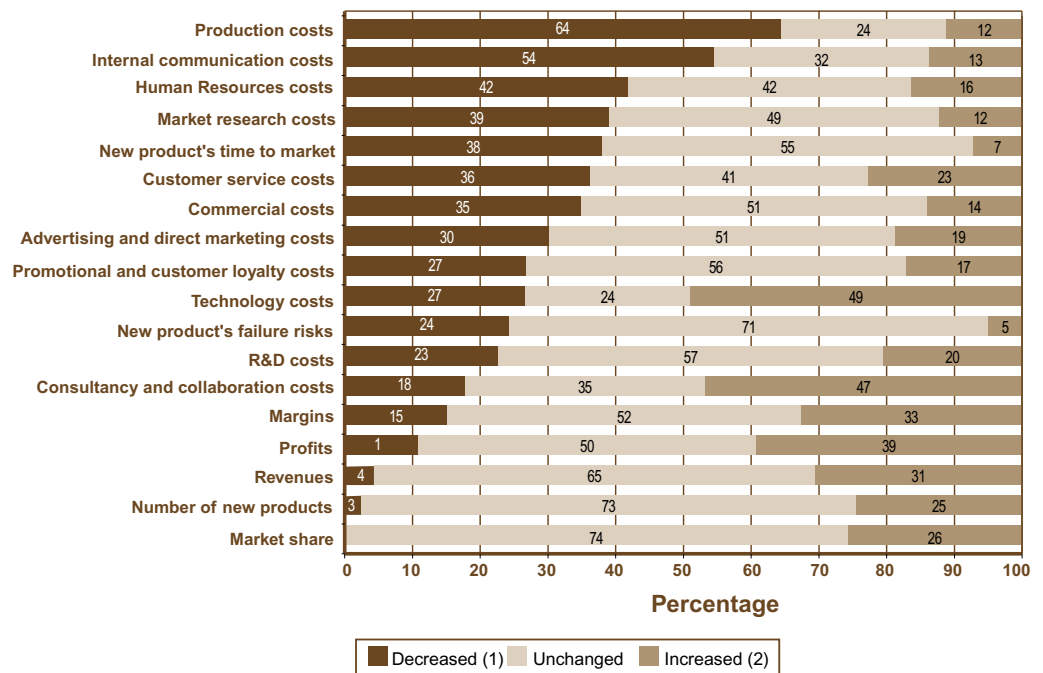
1.5. Impact of technology by business results

ICT has positively affected business results. 64% of the companies surveyed claimed to have reduced their costs of production, 55% their internal communication costs and 42% human resources. In contrast, technology has not contributed to lowering investments in research and development (23%) and consultancy and collaboration services (18%).

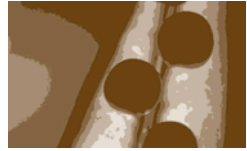
None of the companies surveyed believes that the new technologies have lowered their market share; the majority (74%) believes that it has remained steady, and 26% think it has increased. However, almost half (49%) of the companies interviewed have noticed an increase in the technology costs. Only 5% of the respondents declared that the implementation of ICT in their businesses has increased the risk of new product failure.

Consequently with the results obtained in terms of comparisons of online and traditional business, few companies believe that the margins, profits and revenues have fallen with the introduction of ICT (see Figure 21).

Figure 21. Impact of the Technology in the Business Results



(1) Under this category, the answers "decreased" and "significantly decreased" are grouped together.
(2) Under this category, the answers "increased" and "significantly increased" are grouped together.

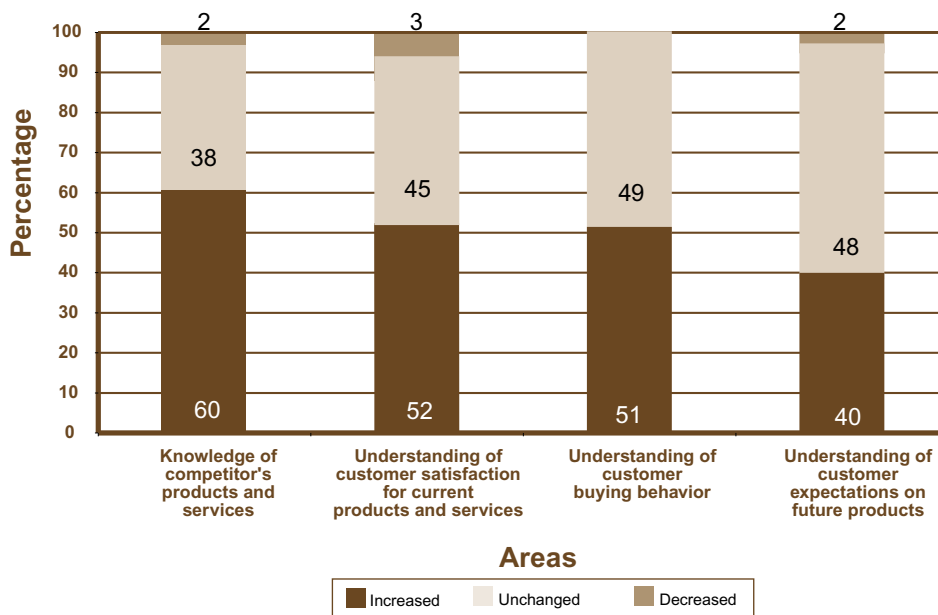


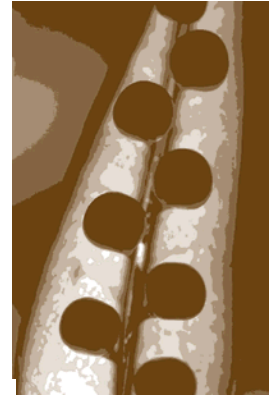
Strategic areas affected by ICT

Given the impact that the new technologies have been shown to have on businesses, companies have adjusted their business strategies to adapt to the new market circumstances. Thus, companies have increased their interest in learning about the competition's products and services and finding out users' satisfaction with current services. However, the majority of companies have not changed their strategies for getting to know users' expectations for future products.

Additionally, the companies claim that none of their strategic areas has become less important after the implementation of ICT in their organizations (see Figure 22).

Figure 22. Strategic areas impacted by Technology



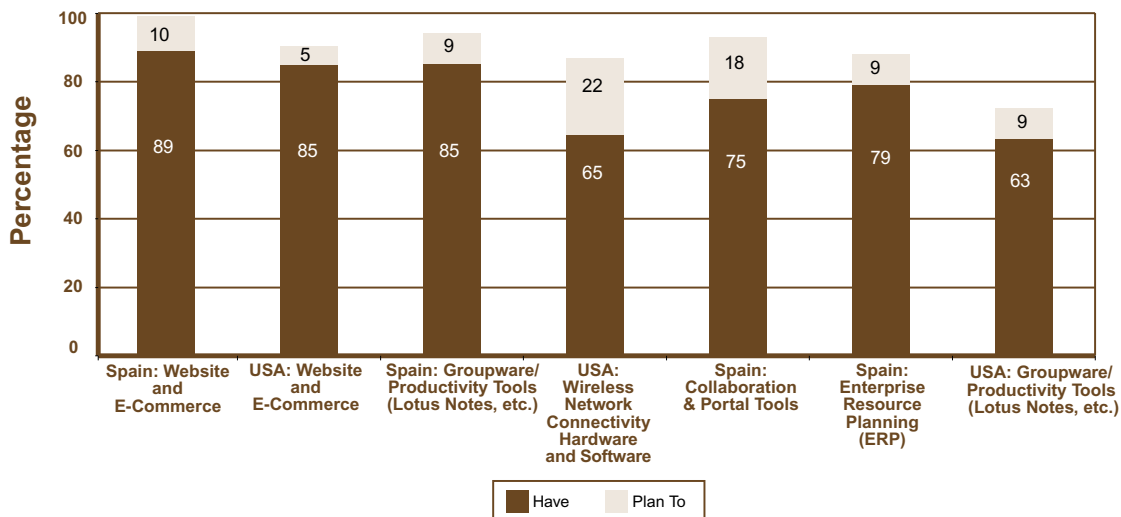


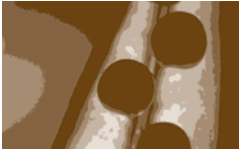
2. The Situation in Spain compared to the United States

The technological trends in Spain and the United States are quite similar. In both countries, the most widespread technological tools are websites and e-commerce. Nonetheless, despite the fact that these technologies stand as the most widely used in U.S. businesses, they are used less there than in Spain (see Figure 23).

Hardware and software for wireless network connectivity is the second most widely used technology in the United States, while in Spain this technology came in fifth place in 2004 and fourth place in the forecasts for 2007.

Figure 23. Most used technologies Spain - USA

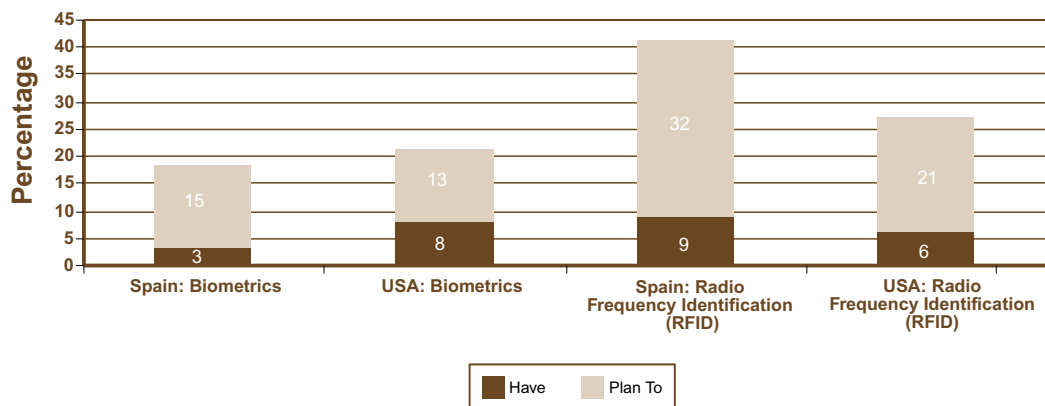




In the United States, enterprise resource planning systems are not among the most widespread technologies, whereas in Spain they are currently in third place.

In terms of the least frequently used technologies (see Figure 24), biometrics and radio frequency identification (RFID) both stand out. Nevertheless, in the United States biometrics is more widespread than in Spain, where only 3% of companies use it compared to 8% of U.S. companies. The forecasts for 2007 indicate that the same situation will prevail.

Figure 24. Less used technologies Spain - USA



Spanish companies seem to be more willing to implement the use of RFID than U.S. companies. Thirty-two percent of the companies in Spain claim that they plan to adopt these technologies by 2007, compared to only 21% in the U.S. Furthermore, this technology is currently used less in the U.S. than in Spain.

Budget trends in Spain shown a greater inclination towards the adoption of hardware and software for security (see Figure 25).

However, for both countries, the items that have risen the least are those earmarked for on-demand computer services and outsourcing to third countries. In the case of Spain, the budget allocated for on-demand services has grown in only 20% of the companies, while this rate in the U.S. is even lower (15%). Another 15% of Spanish companies have increased their budget for outsourcing to third countries, a rate that in the U.S. barely exceeds 10%.

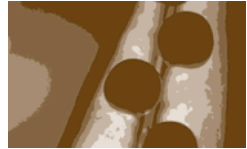
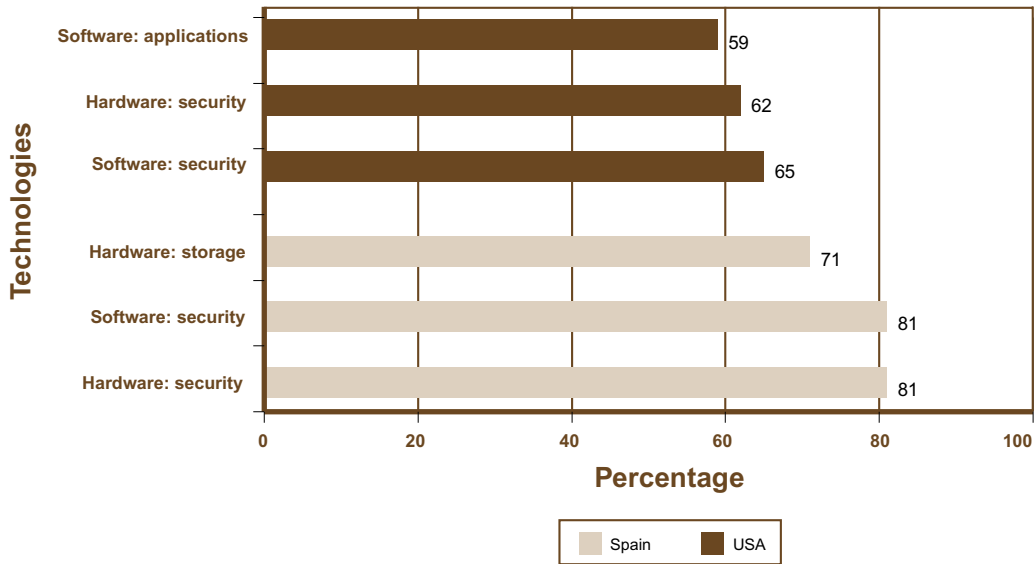


Figure 25. Budget Trends Spain - USA



In terms of the changes that have taken place in companies' internal organization (see Figures 26a and 26b), both countries also converge in claiming that there have not been major changes in the number of middle-management positions or in the staff as a whole. What has undergone a significant transformation in both countries is the way of working after implementing ICT in companies. A high number of U.S. companies responded that ICT has increased the intelligent demand for information at an executive level, the proportion of employees working at a computer and the need to improve skills at the lower echelons.

When analyzing the responses from the U.S. in terms of the impact of ICT on structure, the most significant trend identified in the Spanish companies was corroborated: the availability of decision-making tools and online technologies has increased.

However, unlike what has taken place in Spain, more than half of the American companies (54%) claim that their organizations are increasingly horizontal. In the U.S., geographical dispersion has also risen, which contributes to making companies' internal organization more flexible and horizontal. What is more, automated supervision of worker productivity has also increased, although the U.S. responses resemble those of Spain in that the organizations do not provide employees with productivity-based incentives.

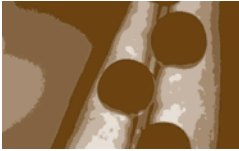


Figure 26a. Spain: Internal Organization Workforce

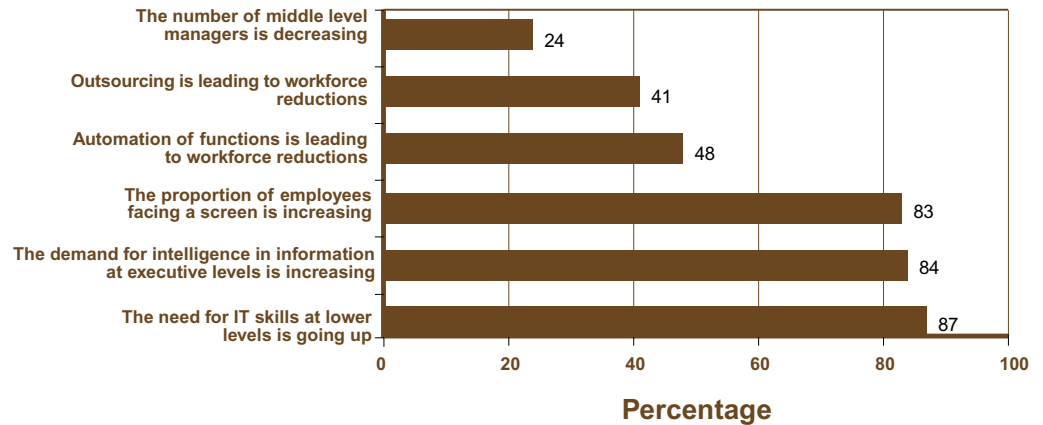
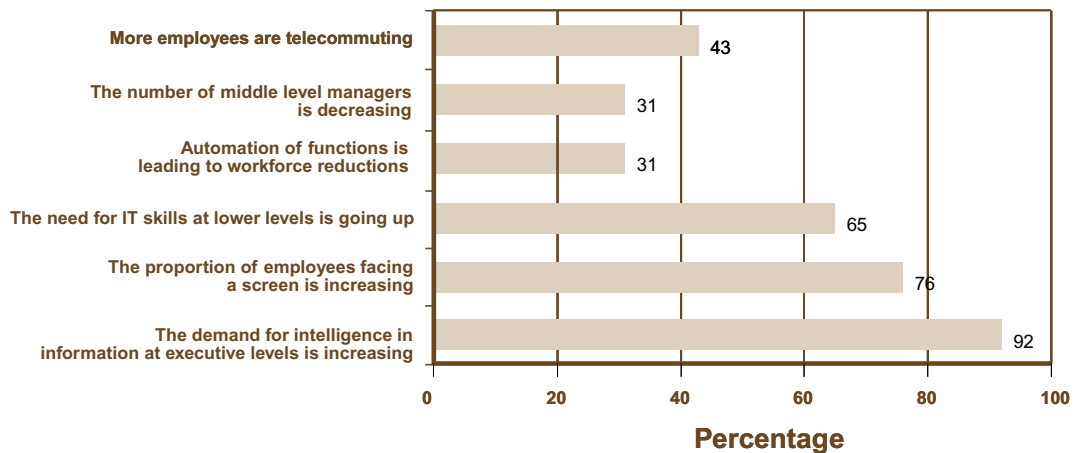


Figure 26b. USA: Internal Organization Workforce

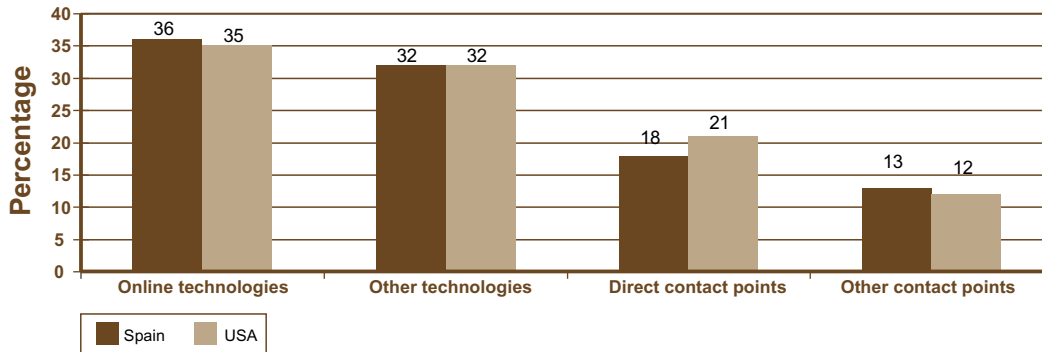


In the United States, the budget earmarked for outsourcing processes related to ICT is higher than that for unrelated processes. The same holds true in Spanish companies, despite the fact that in both countries the majority of companies allocate less than 1% of their sale revenues for this.



The way of contacting customers is quite similar in both countries. The Spanish and U.S. companies mainly use online contact. This shows that – despite the fact that in both countries the telephone remains the main means of company-customer communication – the new technologies have gained substantial ground, especially in the case of e-mail and online catalogues (see Figure 27).

Figure 27. Customer Contact Points Spain-USA



In the United States, market segmentation is done by geographical zones, just as in Spain. The least widely used method is developing user communities (13% for Spain and 8.9% for the U.S.) and automated cross-selling (3% for Spain and 5.9% for the U.S.).

The mechanism most often used in the U.S. to analyze customer data are data mart and data warehousing applications, followed by statistics. For Spain, both mechanisms are also quite widely used, although customer profiles come in first place. Both U.S. and Spanish companies do not make much use of neural networks.

In both countries, the prime methods of online advertising are advertisements on other websites, advertisements on browsers and incentives on printed matter. However, in the U.S. the proportion of companies that use these advertising methods is higher (see Figure 28). The Spanish companies prefer advertising in online magazines. Webinars, pop-ups and discussion groups come in last place in both countries.

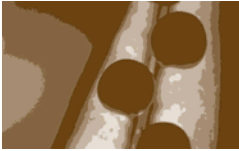
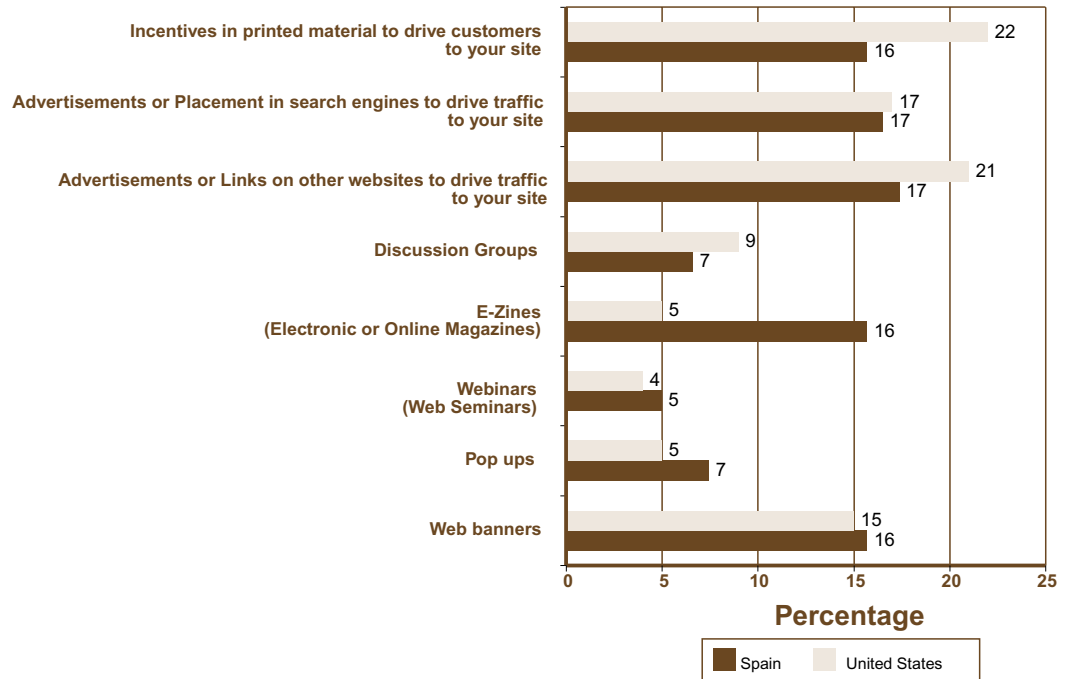


Figure 28. Online Advertising Methods

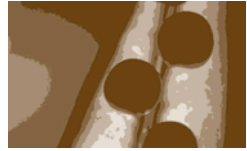


The American companies express a greater willingness to change their corporate image as they join the online world. Indeed, while in Spain the majority of companies have not changed their corporate image (logo, slogan, name, brand concept), 23% of American companies have modified their brand concept and logo.

Comparing online and traditional business results, we can see that fewer U.S. companies believe that their sales volume are higher in online business (7.6%) compared to the 12% of Spanish companies that do believe their online sales are higher.

For both countries, the main difference between online and traditional settings is that the number of actions by users is higher in online business than in traditional business. The same holds true for data gathering.

In both countries, the most popular way of communicating with suppliers is EDI, although it seems to be more widely used in Spain: 65% of Spanish companies make use of this technology compared to 45% of U.S. companies.

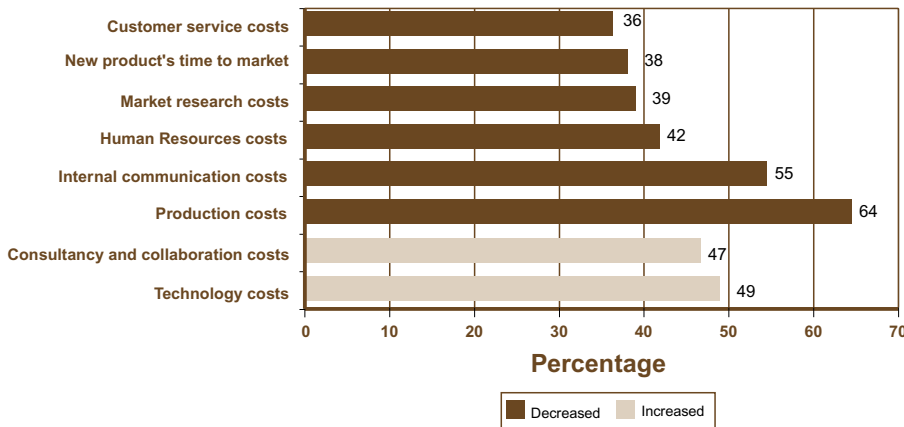


Communication based on XML technologies is more frequent in the U.S. than in Spain. In Spain, only 37% of the companies use XML compared to 43% in the United States, making it the second most popular application in the U.S.

The least popular applications in both countries are supplier relationship management and collaborative planning and forecasting.

Technology affects an array of economic and operational results. The highest cost reductions in the U.S. have taken place in internal communication (a reduction or significant reduction in 40.7% of the companies) and production (a reduction or significant reduction in 34.3% of the organizations) (see Figure 29).

Figure 29a. Impact on Spanish Firms Costs



In both Spain and the U.S., the costs of customer services, human resources and market research have also gone down, as has the time to market for new products.

However, the costs of technology and consultancy and collaboration have risen for a significant number of companies: 53.2% in the U.S. and 49% in Spain. Specifically, the costs of consultancy have risen to 29.8% in U.S. organizations and 48% in Spanish organizations.

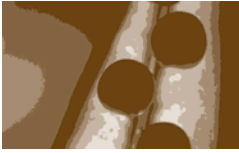
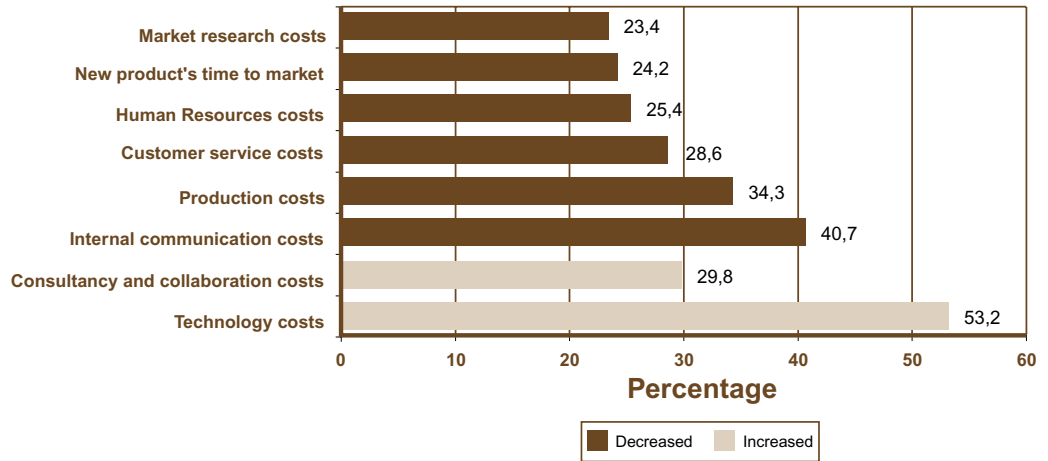
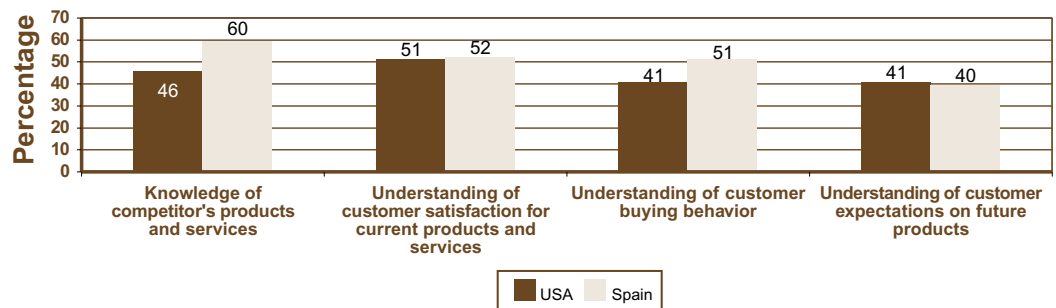


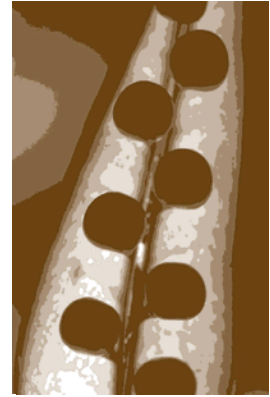
Figure 29b. Impact of ICT on Costs USA



In both countries, technology has also influenced companies' strategic areas. 51% of U.S. companies and 60% of Spanish companies give greater importance to the customer satisfaction strategy for products and services, while 45.9% in the U.S. and 52% in Spain are more interested in learning about the competition's products and services (see Figure 30).

Figure 30. Strategic areas impacted by technology Spain - USA





Conclusions

The inclusion of information and communication technology in businesses has made cost-cutting possible mainly in the areas of production and internal information flows. This is the overall impression of Spanish executives, who, nonetheless, believe that there have not yet been significant changes in operating margins and revenues.

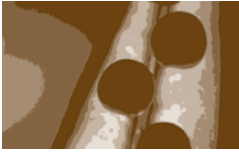
Spanish companies believe that ICT is especially important to their internal organization, not only in terms of communication but especially in the creation of new work habits. Although the majority of companies have not noticed a significant drop in the number of middle managers, many claim, for instance, that the number of employees working in front of a computer has risen considerably.

In terms of customer relations, few Spanish organizations have specific technologies such as online transactions and online intermediaries. However, the majority do use e-mail and websites to communicate with their customers.

It is also clear that technology has contributed to making Spanish companies' strategies more user-oriented: a high percentage of companies expressed acute interest in user satisfaction with their product range. Interest in finding out about competitors' products is also on the rise, which indicates that the implementation of ICT in companies somehow generates stiffer competition between companies.

In general, the structure of the ICT budget in Spanish companies is highly similar to that in U.S. companies. Both have noticeably stepped up their investments in hardware and software, especially for security purposes.

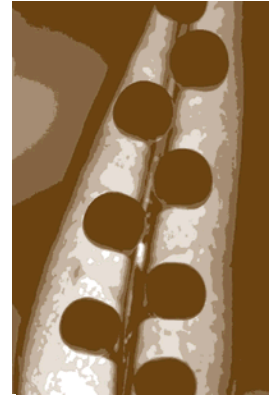
Furthermore, executives in Spain tend to outsource fewer services, in both ICT and other areas, than their U.S. counterparts.



ICT as an Agent of Change in Spanish Companies.
Current Situation and Future Trends

The main difference between the implementation of ICT in the United States and Spain lies in the organization of the work force. While ICT has not significantly contributed to simplifying structures in Spanish companies, more than half the companies in the United States believe that their organizations are now more horizontal, while the geographical dispersion of workers has also increased.

ICT has already had a significant impact on most of the business world; however, executives are still waiting for many of the expectations aroused by technology in the past few years to come true.



Bibliography

- Bartels, A., «North American IT Spending in 2005», Forrester 2005.
- «CIO Magazine Tech Poll April 2005», *CIO Magazine*, May 2, 2005.
- Economic Research, Department of Economics, University of California, Ghosh, A., «Information and Communication Technology in India and its Impact on Business Sectors a pilot study», Shailesh J. Mehta School of Management, IIT Bombay, 2004.
- «El uso de las TIC por las empresas», Fundación AUNA, 2004.
- Hall, B. and B. Khan, «Adoption of New Technology», Institute of Business and INE, «Encuesta sobre equipamiento y uso de tecnologías de información y comunicación en las empresas», 2003.
- INE, «Inventario de indicadores para la evaluación comparada de Europa 2005», 2005.
- Karmarkar, U., and M. Vandana, «Business and Information Technologies Annual Report», UCLA Anderson School of Management, 2004.
- «La microempresa española en la sociedad de la información», published at Red.es, 2004.
- «Las TIC y las transformaciones de la empresa catalana», published at Universitat Oberta de Catalunya, 2003.
- Mandelli, A., A. Biffi, C. Demattè and C. Parolini, «First results from the Italian WIP-BIT study», Los Ángeles - UCLA Anderson School of Management, 2003.



- Markus, M. L. and D. Robey, «Information technology and organizational change: Causal structure in theory and research», *Management Science*, 34 (5), 1988, pages 583-598.
- Markus, M. L., B. Manville and C.E. Agres, «What makes a virtual organization work?», *Sloan Management Review*, 42 (3), 2000, pages 13-26.
- Miralles, F., S. Sieber and J. Valor, «CIO Herds and User Gangs in the Adoption of Open Source Software», 2004.
- Orlikowski, W. and J. Baroudi, «Studying information technology in organizations: Research approaches and assumptions», *Information Systems Research*, 2 (1), 1991, pages 1-29.
- «Productividad, crecimiento económico y TIC», Gaptel, publicado por Red.es, 2004.
- Restrepo, G., «Las tecnologías de la información y las comunicaciones en la empresa», 1999.
- Miralles, F., S. Sieber and J. Valor, «CIO Herds and User Gangs in the Adoption of Open Source Software», 2004.
- Valor, J. and S. Sieber, «Criterios de adopción de las tecnologías de información y comunicación», e-business Center PwC&IES, 2005.



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