IT and their potential in Chilean businesses: the need to harmonise factors in a developing country

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Abstract

The BIT Chile 2005 survey tried to measure and assess the impact of information technologies (IT) in Chilean firms according to sector and size. It also compared these results with those from the USA and Spain. The main conclusions are: Chilean companies report higher profitability and income due to IT, yet that may be caused by their relatively earlier stage of technological adoption. They also report fewer job cuts due to outsourcing, offshoring, and process automation, although this may change in the future. Besides, the divide between small and big firms grows as IT becomes more sophisticated, even though small businesses show good levels of basic infrastructure such as PCs and connectivity. But this means weaker overall benefits of IT. Thus for developing, adopting countries such as Chile, promotion of technology should be harmonised with the main socio-cultural and political variables surrounding businesses in order to maximise its potential.

This article summarises the findings of the BIT Chile 2005 survey to Chilean firms[1] in the context of the Business and Information Technologies project (BIT) co-ordinated by the UCLA Anderson School of Management. BIT is a complement of the World Internet Project (WIP), initially developed at UCLA but nowadays based at the USC Center for the Digital Future. While BIT focuses on the effects of IT in business and the economy through a managerial, economic perspective, WIP studies the influence of these tools in everyday life and has a more sociological, communicational character. The Chilean team is one of the few examples worldwide of a truly multi-disciplinary research team composed by experts from all these fields.

The BIT Chile 2005 survey tried to measure and assess the impact of information technologies (IT) in Chilean firms according to sector and size. It also compared these results with those from the USA and Spain. The main conclusions are:

(a) Firms report higher profitability and income due to IT than Spain and the USA, yet that may be caused by their relatively earlier stage of technological adoption;

(b) Reported job cuts due to outsourcing, offshoring, and process automation are lower than in Spain and the USA, although this may change in the future;

(c) Firms are conscious that IT-supported collaborative work enhances relationships with business partners -59% use electronic mechanisms to communicate and/or make transactions. Yet higher value-added applications are required to increase electronic payments and yield more integrated supply chains, among others.

(d) The divide between small and big firms grows as IT becomes more sophisticated. The small businesses have good levels of basic infrastructure such as PCs and connectivity, but lag far behind than the bigger ones in more advanced technologies such as wireless networks, biometrics, RDID, digital certification, and supply chain management applications. On the other hand, the latter sub-utilize these advanced tools because of the lack of network economies –their smaller providers and/or clients do not use these systems.

(e) Latin America is by far the most relevant region in terms of foreign operations for globalised Chilean firms, despite the importance of other areas around the world as well; and

(f) Technological development should be harmonised with the main socio-cultural and political variables surrounding businesses studied by the complementary World

[1] Godoy, Sergio; Herrera, Soledad; Lever, George; Myrick, Aldo; Sepúlveda, Marcos (2006): **El impacto de las tecnologías de la información en las empresas chilenas respecto a España y Estados Unidos: resultados de la primera encuesta BIT-Chile 2005**, Comunicaciones, Sociología & Ingeniería, Universidad Catolica de Chile/ Cámara de Comercio de Santiago, Santiago de Chile. Proyecto Fondecyt 1050769.

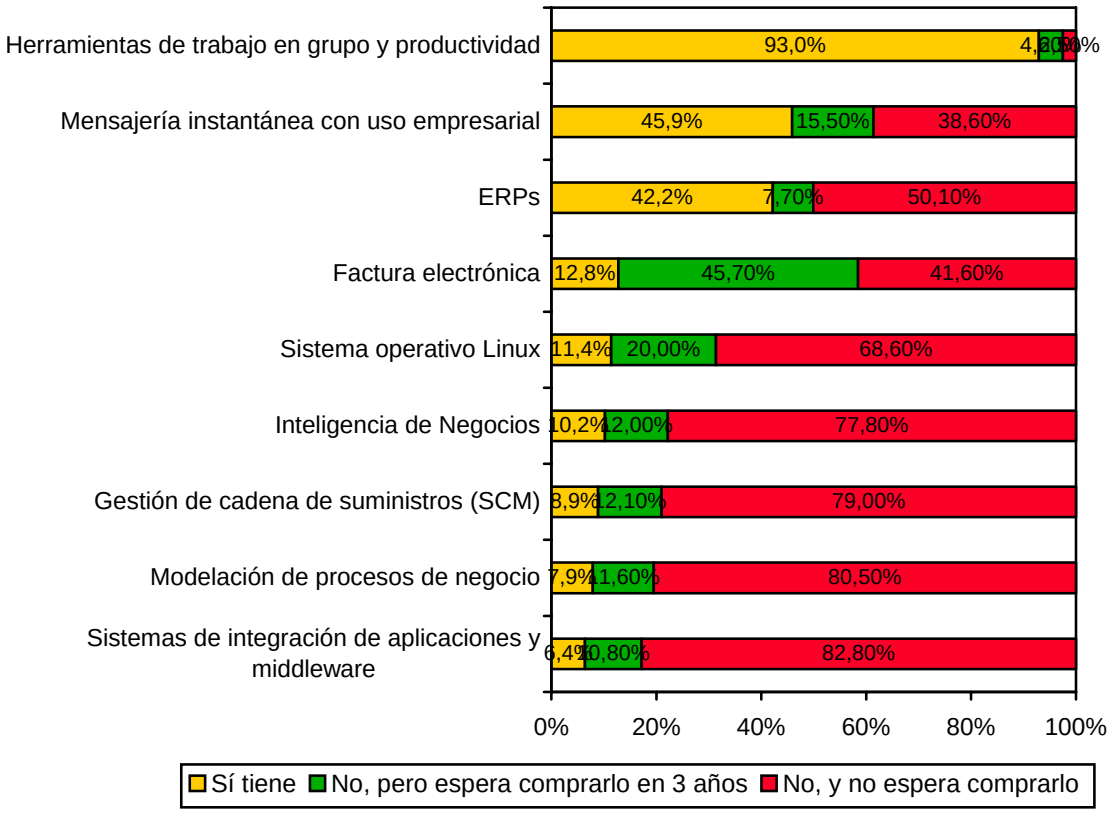
Internet Project, WIP-Chile, executed by the same multi-disciplinary research team as BIT. Promoting technology per se will not be very effective.

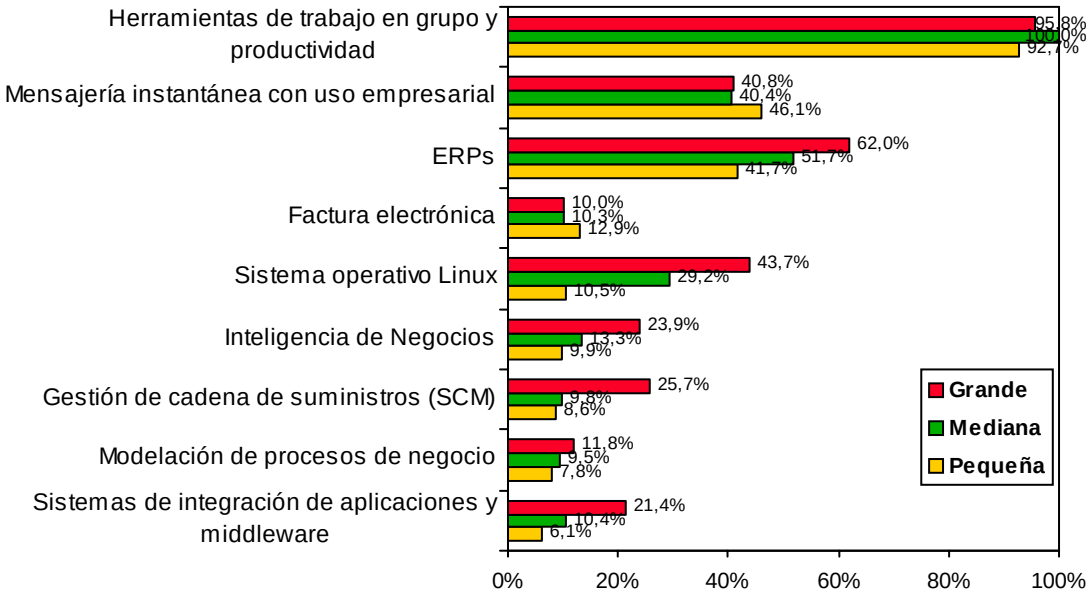
The summary of the different chapters of the study are as follows.

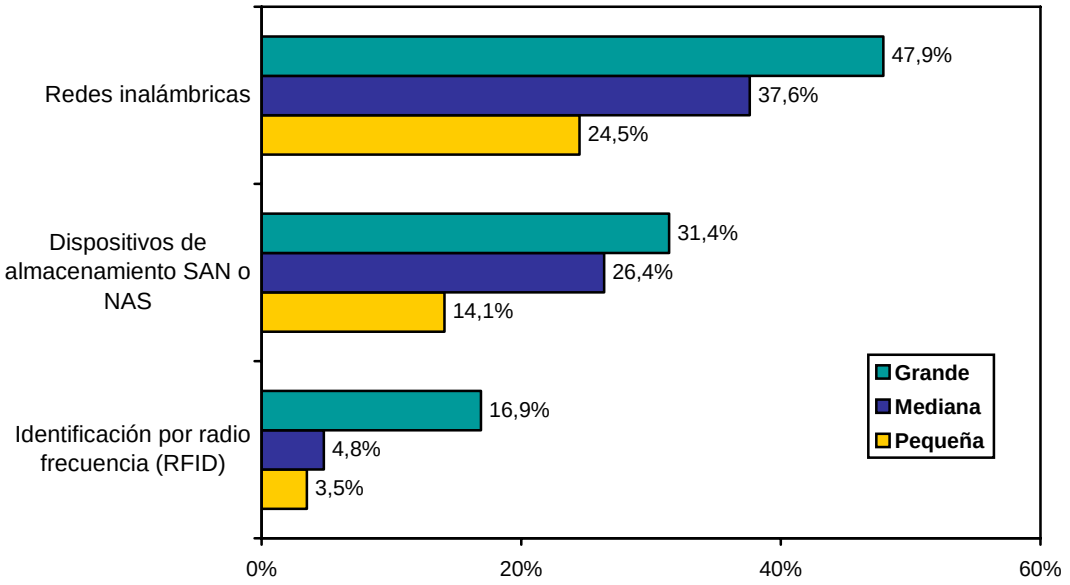
Technology adoption and budgetary trends

The larger the company, the greater the penetration of Information Technologies (IT). When distinguishing between services and manufacturing, some minor differences arise related to very specific technologies.

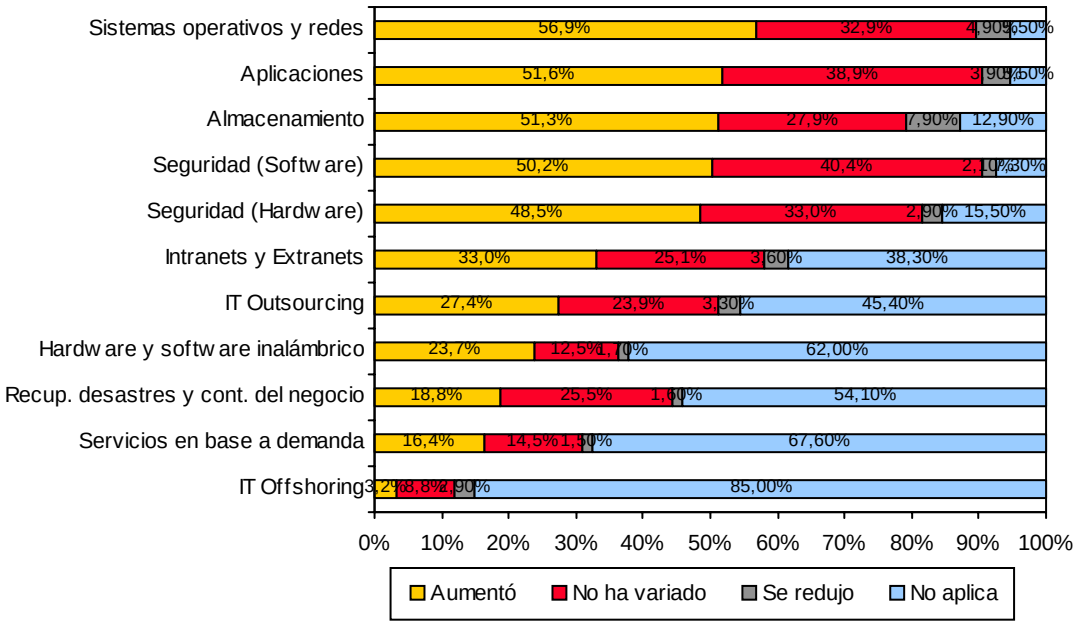
The main IT used by Chilean companies are group and productivity tools (like MS Office or Lotus Notes), antivirus and web sites. IT adoption by Chilean firms is lower than in the USA. This phenomenon can be observed either in consolidated technologies (like wireless networks and e-commerce) or in emerging ones (like Radio Frequency Identification and Biometric Security).

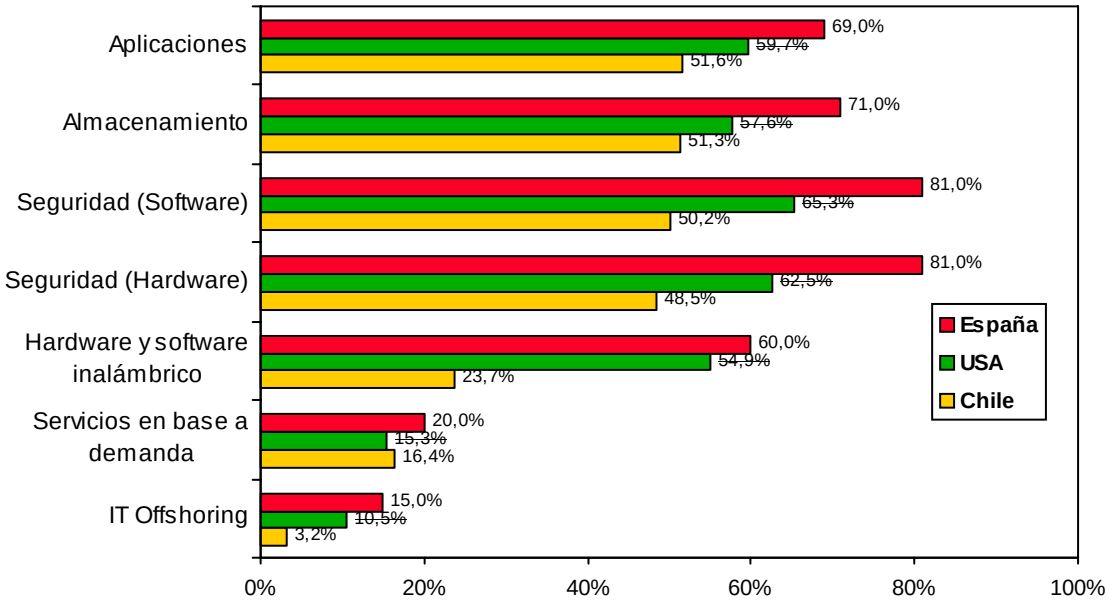






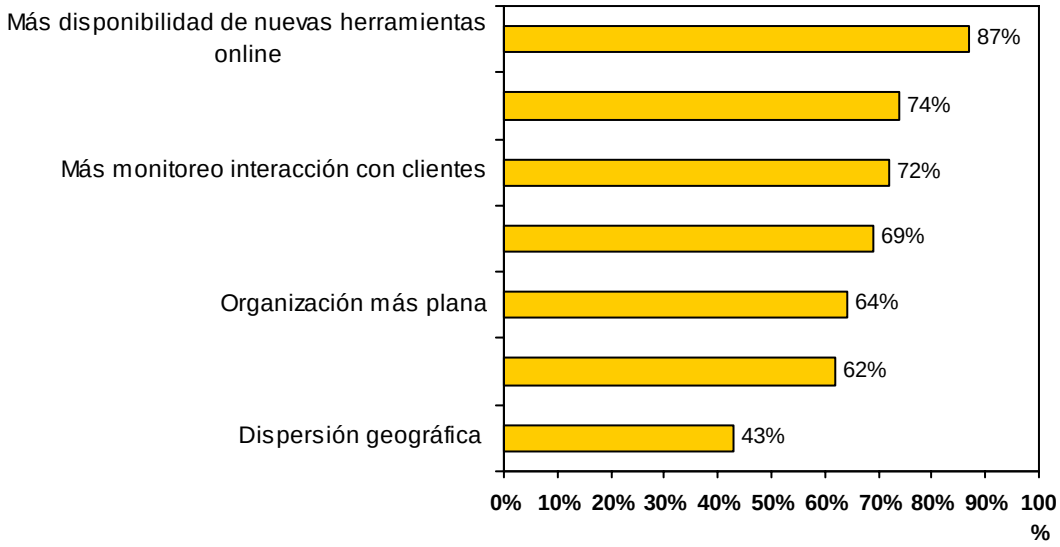
Chilean companies have increased their IT budgets in the last three years, specially the larger ones. Yet these levels are still lower than in the USA and Spain.

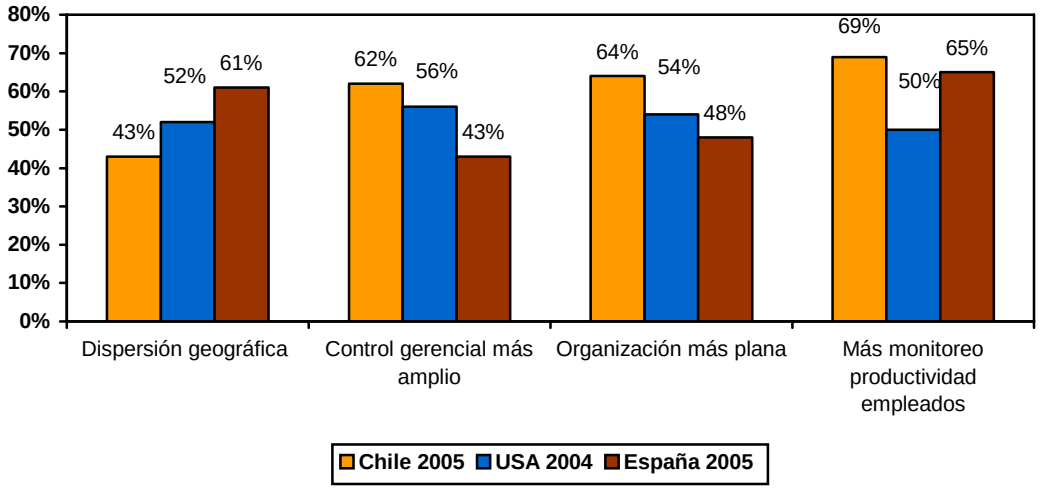




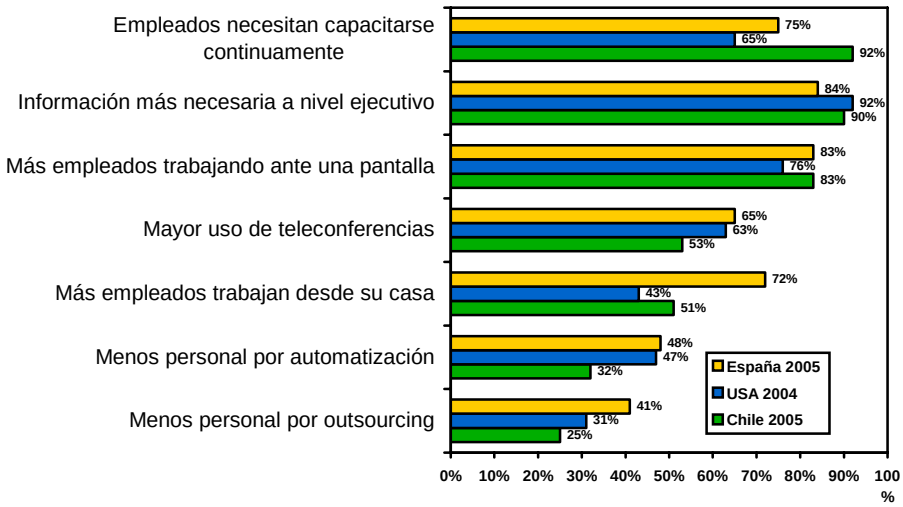
Impact in internal organisation

The main organisational effect of the new online tools in Chile is greater productivity monitoring on employees. Companies are also becoming flatter, with less intermediate hierarchies, like the rest of the world.

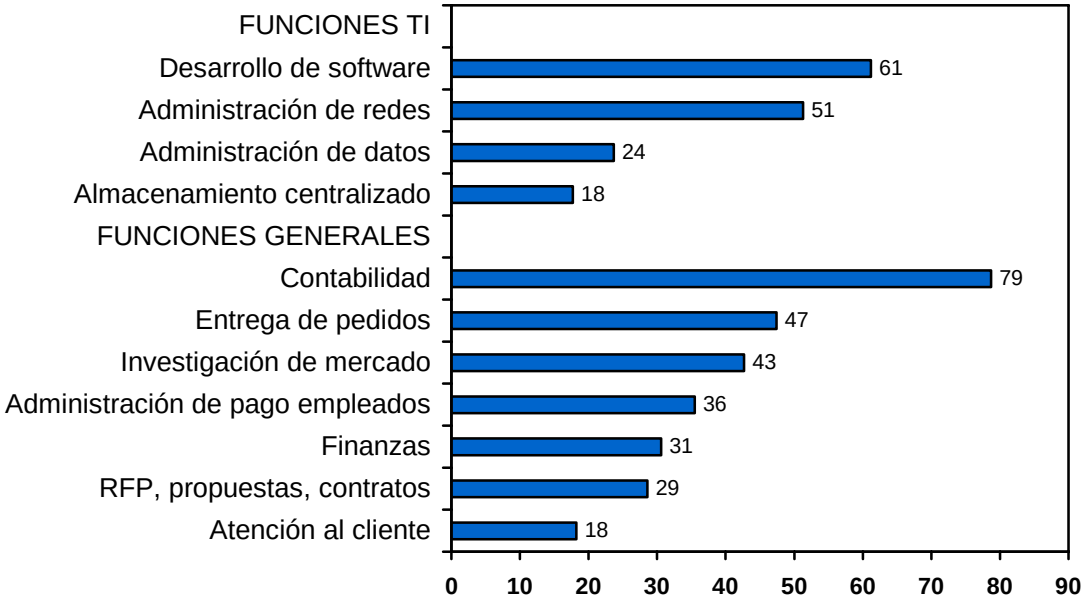




Personnel reduction because of offshoring and outsourcing is not yet an important trend in Chile -though nearly a third of companies have hired less personnel by these causes and 39% outsourced some business processes, such as accounting (79%), software development (61%), and network administration (51%). Except for data storage (outsourced mostly by big and medium-sized firms) and accounting (mostly by small businesses), there are no big differences by size or sector.

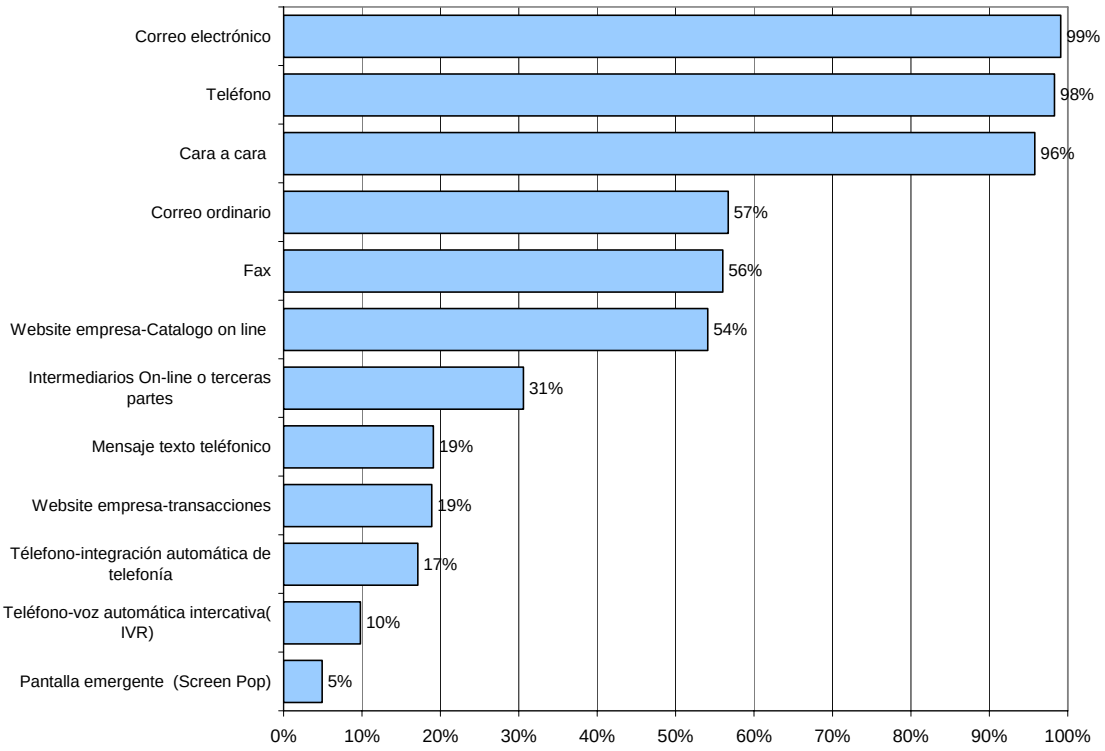


% of firms which outsourced the following business processes:



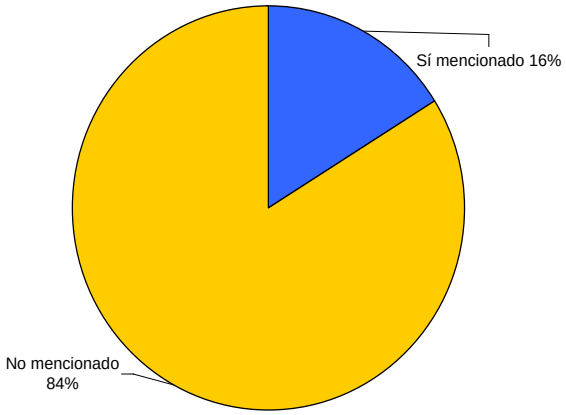
Customer facing interaction and business intelligence

Business viability in the long term depends strongly on customer loyalty. Because of its data processing capacities, IT can be specially useful. The most widely way of contacting customers is e-mail (99%) followed by the telephone (98%) and face-to-face contact (97%), whereas the fax is in slow retreat (56%). In this respect, there are no big differences between small and larger companies.

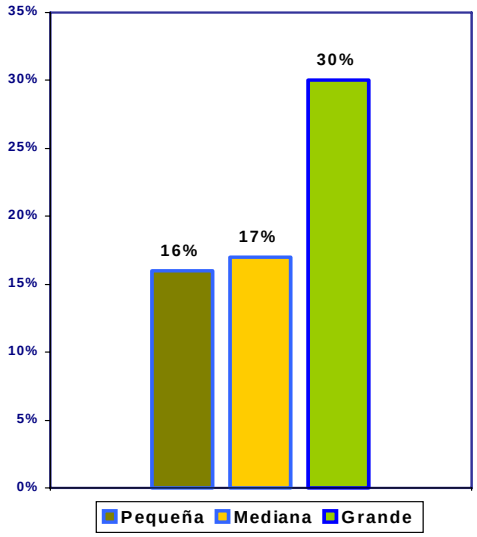


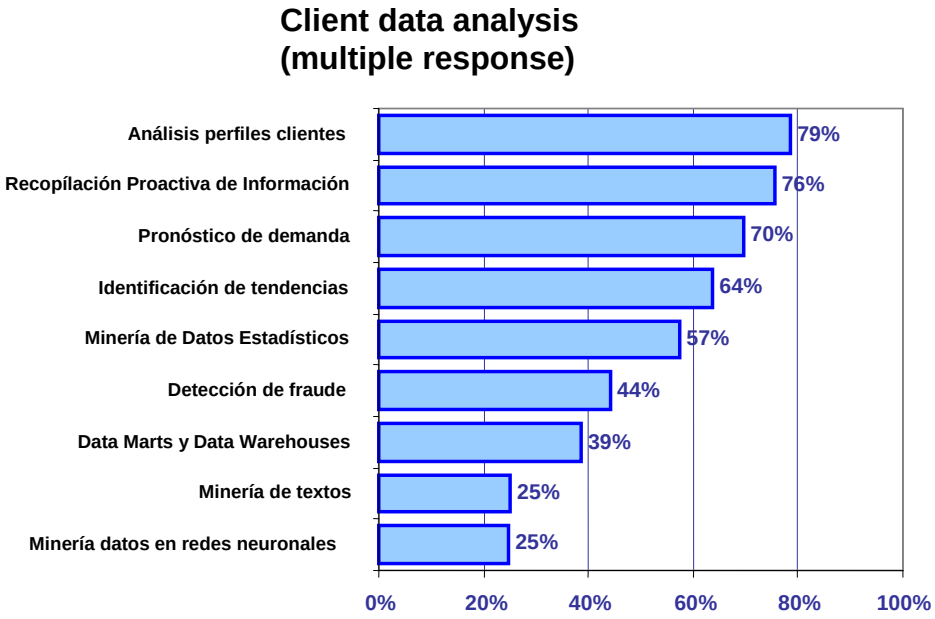
In spite of its strategic importance, business intelligence (BI) is used only by 16% of Chilean companies. Here there are important differences according to size: big firms are twice as likely to use BI systems than smaller ones (16%). Client profile (79%), proactive information collecting (76%) and demand forecast (70%) are the most used customer data analysis mechanisms. Less frequent are data mining and text mining.

Use of business intelligence tools



Use of business intelligence tools, according to size





Online advertising and e-commerce

Although online advertising sales have grown 30% between 2003 and 2004, this channel only represents 1.1% of the whole US$ 560 million of expenditures in one year. Thus, online advertising can be considered an emerging tool at best, with a 20% of use in surveyed companies (specially in the largest ones)

33% of Chilean businesses use the Internet as a sales channel, which confirms the net's growing importance in this aspect. Nevertheless, B2B (*business to business*, US$ 6.6 billion in 2004) is by far more important than B2C *(business to consumer*, only US$ 80 million).

Relationships with trading partners

Another critical function in which IT can be helpful is in business relationships. 59% of Chilean companies use electronic mechanisms to communicate between each other. The most used communication tool is the corporate website (28%). Payroll appears as the second most used mechanism. Less frequent are collaborative planning tools, although surveyed companies declare their demand for them will rise in the next three years.

Business results

One of the most interesting aspects of the BIT study in Chile is the positive evaluation companies made about IT in their business results. Most consider that IT contributed decisively to cost reductions and improving a series of financial indicators, i.e. incomes,

profits, and spreads. In general, cost reduction has been more significant to large companies. At the same time, firms also report that both technological and I&D costs have risen because of IT.

Thus, Chile appears between the United States's relative pessimism concerning overall cost reductions and optimistic Spain. Despite other studies –such as ENTI- reveal a strong frustration caused in Chile by the high expectations built around the ability of IT to reduce costs, these do not necessarily contradict BIT's findings.

IT has also had a much more positive impact on strategic knowledge held by companies than in the USA and Spain. Yet this may be caused because Chile is still in the first stages of the technological adoption curve.

Globalisation

Chilean companies are less globalised than their North American counterparts -13% have trading relationships with other countries in contrast to 31% in the USA (There were no data for Spain to compare). They also report a narrower variety both of suppliers and centres of production and services abroad. Latin America is by far the preferred region of growth for Chilean companies, despite the importance of other areas all over the world. And at least a half of Chilean globalised firms do not plan to have trading relationships outside South America.

24% of companies have establisher their operations outside the country, or are planning to do so. Big manufacturing companies are the more outside-oriented, although not by significant numbers.

Methodology

The BIT Chle study is a bi-annual survey (2005 and 2007) to general managers of small and medium-sized firms, and to Chief Information Officers of big firms. The universe is composed by the firms of Chile's Metropolitan Region, randomly selected according to size (large, medium, and small), and sector (manufacturing and services) with at least one PC connected to the Internet. Size was determined according to government specifications, and sector by self-assessment. The sample consists on 301 face-to-face interviews from a total of 803 firms contacted and randomly selected. The sample was weighted according to size and sector according to data from SERPLAC Metropolitana, the relevant government body. The field study was done between September and November 2005. For the international comparison the most recent BIT reports available from the USA and Spain were used (Kamarkar & Mangal, 2004; and Sieber & Valor, 2005; respectively).

Conclusions

As said at the beginning, the main conclusions of the BIT Chile 2005 survey include the higher profitability caused by IT reported by firms (although the cause may be the relatively recent stage of technological adoption in Chile), which suggests a great potential for digitalisation. Some complementary studies (see ENTI 2005) reveal management frustration with IT in these topics, but that may be caused by the frustration generated by over-optimistic expectations rather than by actual business performance.

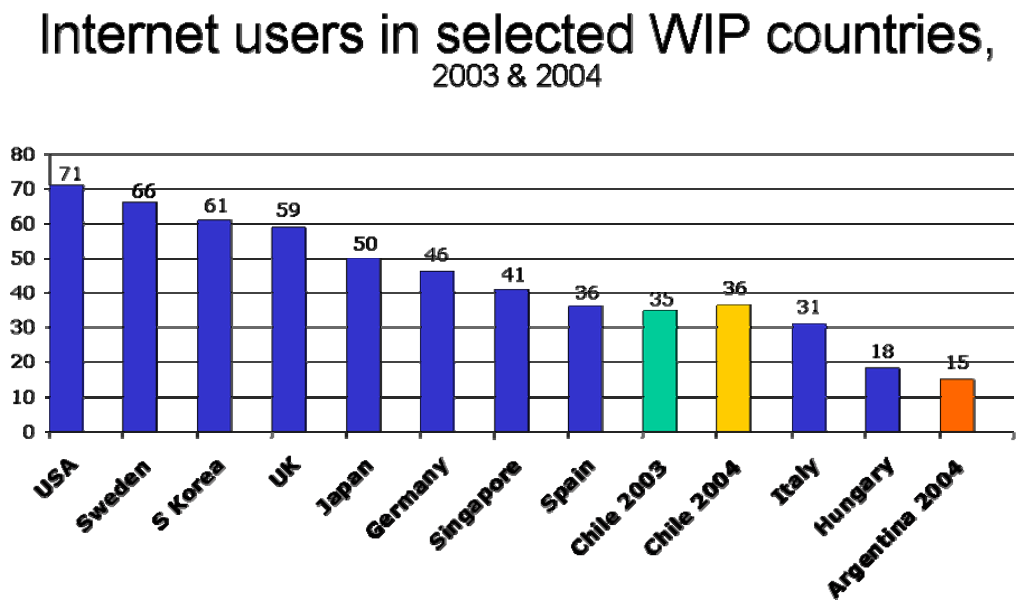
Secondly, fewer job losses due to outsourcing and offshoring are reported in contrast to Spain and the USA. Yet this may change in the future, considering that between a fourth and a third of Chilean businesses have already reduced personnel due to this cause. We still have to confirm that the GNP is changing towards a higher proportion of information services as in the USA and, furthermore, check if the economy as a whole is losing workplaces by migration to lower-cost countries as it already happens in English-speaking nations.

In addition, Chilean firms appear less globalised than its US counterparts. There are some interesting differences concerning size and sector (for instance, smaller firms are mostly internationalised in terms of suppliers, whereas the big ones have expanded trade abroad), and at the same time Latin America appears as the most likely place to do international business with –despite the country has been highly successful in securing bilateral trade agreements worldwide.

Despite these positive traits, BIT Chile confirmed a significant technological gap between SMEs and big companies. The smaller ones have good levels of basic infrastructure such as PCs and connectivity, but lag far behind than the big in more advanced technologies such as wireless networks, biometrics, RDID, digital certification, and supply chain management applications. On the other hand, the latter sub-utilize these advanced tools because of the lack of network economies –their smaller providers and/or clients do not use these systems.

Companies probably cannot go faster than the people inside them. The WIP-Chile project, complementary to BIT[2] shows 36% of web users in 2004, the highest level so far in Latin America (see figure below).

[2] "World Internet Project-Chile: Monitoreando el futuro digital", Fondecyt project Nº1030946 (2003-2004), see http://www.wipchile.cl.



Are the Chilean organisations really taking advantage of the full potential of IT? There is some scattered evidence that suggests otherwise.

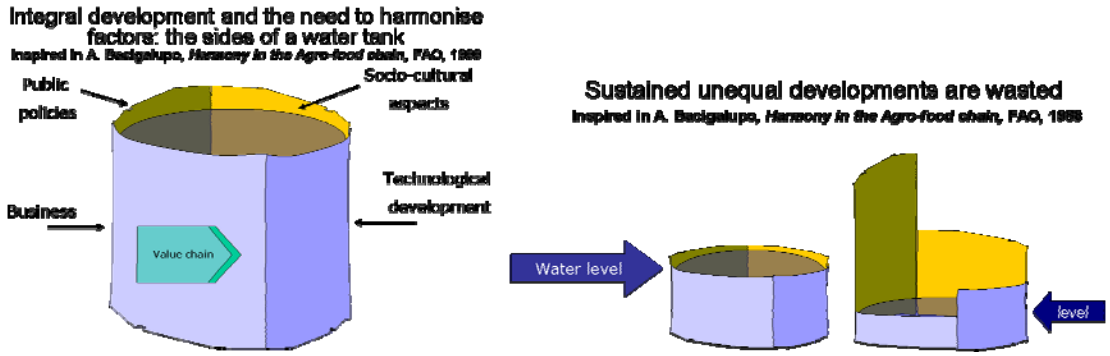
For instance, a case study developed as a part of the WIP/BIT Chile project (Pérez, 2005) concluded that benefits are largely lost unless management and value creation are modified accordingly –especially in information services. Pérez (2005) analysed the impact of IT on two schools in Santiago which received a significant government endowment including computers and Internet connections (the endowment's name is Plan Montegrande), and found that the main outcome of those organisations (i.e., better education) was not specially affected by these tools. This study included the BIT questionnaire to the headmasters (considered as managers of an information service organisation), as well as the WIP questionnaire of web usage to students, among other instruments.

The headmasters' answers revealed almost no enhancement of the value-creation process, apart from rather low skills in technology. Instead of "desirable" traits such as flatter organisations, a better knowledge of their clients, rivals and/or market opportunities, or a strategy more aligned with the Information Economy, the principals relied on IT to generate one-way, informative websites and increase their own control over personnel. In other words, IT did not alter the "classic" organisational culture of Latin-American firms inspired in the *latifundio* (huge estate or farm), where resources were (inefficiently) exploited in an extensive, not intensive way. This model favours a paternalistic relationship between manager and employee in which the latter receives protection in exchange for loyalty from the former. The relationship is nevertheless based on mutual distrust, and relies on informal communications networks. All this generates non-meritocratic, hierarchical structures in

which employees show low levels of responsibility and initiative. Furthermore, there is little consideration of clients and competitors (Rodríguez, 2001).

A complementary study to BIT-Chile, ENTI (Encuesta Nacional de Tecnologias de Informacion, executed by members of the BIT-Chile team), shows additional information worth considering. ENTI surveys a sample drawn from Chile's 300 bigger firms, and reported weaknesses such as a low profile of the CIO (37% has a very secondary position in the organisational structure), low IT budgets (43% of CIOs reported budgetary autonomy over amounts lower than US$ 5,000 per year), low levels of investment (1.7% of sales in comntrast to 3.4% in the USA), lack of indicators to measure IT projects (20%), and low profitability –both effective and expected (19% and 15% respectively). At the same time, the most relevant benefits were the high consistency between business plans and information systems (84%), and the high satisfaction of CIOs as well as their conformity with their firms's adequacy to the world's most recent technological trends. In short, ENTI recommended placing IT in the strategic focus of the firm, rather than simply as a cost centre. Apparently, organisational culture had much to do with this perception (see Csazsar & Sepúlveda, 2004).

To advance in this challenge it is useful to consider overall development as a four-sided water container, in which water equals overall prosperity (see figure below). One of the sides is technology. The others represent the socio-cultural environment, public policies, and businesses. At least in the Chilean context, it is better to keep all factors growing harmonically rather than promoting technology alone. A gap can be tolerated and even be advisable as a model for the other factors for a relatively short period of time, yet in the long run the container can only hold the water kept by the lowest side of the container[3].



As the WIP/BIT Chile project considers the firm, the economy, and everyday usage of IT by common people, we expect to outline the way of promoting all sides of the container in an harmonious way.

[3] Based on Antonio Bacigalupo's Agri-food Model of Development, from the Food and Agriculture Organisation of the United Nations (FAO) in Santiago de Chile.

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