

Information Technology Contribution for Local Production Arrangements Formation

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ABSTRACT

This work analyses the potential for information technology projects (IT) to become a source of competitive advantage and the prospect of these projects contributing to the formation of local productive arrangements. The analysis is based on case research carried out in industrial companies in the ABC region of Greater São Paulo. Private companies, IT suppliers and the region's city administrations took part in the research. The research found that the large companies that were looked at consider IT projects as a source of competitive advantage, but show no inclination to broaden the scope of these projects in the sense of favoring the formation of "local productive arrangements", which would improve the technological level of small companies in the region and would contribute to regional development.

KEY WORDS

Information technology; local productive arrangements; business networks.

1. INTRODUCTION

Information technology (IT) has been a fundamental element in transforming society and organizations, especially as from the 90s. This transformation has demanded the increased attention of companies as far as their strategies are concerned and has added to the importance of the strategic use of IT resources. In this environment the possibilities that technology offer when it comes to supporting the relationships and actions between suppliers, customers and partners are particularly important and can provide important competitive advantages.

The first objective of the work was to check if industrial companies consider their IT projects to be possible sources of competitive advantage and to ask them to specify what projects these are. The second objective of the work was to identify from the projects that were considered as sources of competitive advantage those that could lead to the setting up or the strengthening of ties between companies, i.e. support "company networks". The third objective was to evaluate the potential of IT as an element for supporting the establishment of company networks and to try and identify the possible mechanisms needed for spreading IT throughout the value chains that we studied. To do this we researched companies in the Greater São Paulo ABC region and in particular the automobile industry, which is the most important in the region.

Human, technological, management and business aspects are some of those related to the development of IT projects. It is also clear that any advantages that might arise from these projects presuppose that they were successful, and therefore it is important to identify those aspects that are most relevant in highly successful IT projects. Because of this the research also tried to identify the aspects considered as important for success in the IT projects we looked at.

The assumptions the research made were:

- Large companies are interested in participating in and developing company networks;
- Large companies invest in the introduction of information systems for supporting company networks;
- Outsourcing is welcomed by large companies;
- Large companies with a greater level of outsourcing are more inclined to develop company networks.

These assumptions are based on the theory of company networks and virtual organizations, topics which are discussed in this work. The research also considered that these assumptions permeate the companies' IT areas, and that therefore they would be pro-active in the sense of encouraging "local productive arrangements". We then present the summary bibliography that establishes the basis of the concepts involved in this work, the characteristics of the sectors we researched in the ABC region, the research methodology used, a report on the cases studied and the conclusions we were able to draw.

2. IT AS A SOURCE OF COMPETITIVE ADVANTAGE FOR COMPANIES

Various authors have discussed the question of the role of IT as a source of competitive advantage for companies (Porter and Millar, 1985; Powell and Dent-Micaleff, 1997; Ciborra, 2002; Galliers and others, 2002). In short, competitive advantage arises from new IT-based undertakings, which suggests a possible relationship between the introduction of IT projects and an increase in corporate competitiveness. Among these IT projects those that currently stand out are those that go beyond the limits of the company, i.e., those that connect companies to customers, suppliers and partners. Various studies indicate that projects of this nature can favor the redefinition of relationship standards, contribute to the creation of strategic alliances and offer competitive advantages to all those involved.

To consider IT as a source of competitive advantage has recently led to a controversial argument arising because of an article published by Carr (2003), who argues that the commoditization of IT implies a decrease in its importance as a strategic resource for companies. It is a fact that IT is transforming itself into an infrastructure that is common when it comes to doing business, although this can also provide competitive advantages for companies that manage to take advantage of the spread of technology. In the context of this work the IT commoditization argument is considered important for making company networks viable as this might possibly provide a good opportunity for obtaining a competitive advantage.

The bibliography mentions various approaches to the theme of IT as a source of competitive advantage. In this work we chose a resource-based vision as being the most appropriate for analyzing the role of IT as a source of competitive advantage. In accordance

with this theory companies really can obtain competitive advantage by using IT, but in principle only when it is associated with intangible additional resources (Powell and Dent-Micaleff, 1997). These authors set out the additional resources that they consider to be important:

- Additional human resources, as characterized by an open organizational structure, unrestricted communication, organizational consensus, the commitment of the CEO, organization flexibility and the integration of IT and corporate strategy.
- Additional business resources, as characterized by relationships with suppliers, the internal spread of IT, guidance with regard to business processes, guidance with regard to teams of people, benchmarking and IT planning.

Based on this resource-based vision we included in the research an analysis of the additional factors and those that might be associated with IT projects being characterized as a source of competitive advantage.

3. COMPANY NETWORKS AND LOCAL PRODUCTIVE ARRANGEMENTS

According to Nohria (1992), renewed interest in prospects for company networks occurs mainly because of the appearance and rise – in substitution of small vertically integrated companies – of small entrepreneurial companies, involved in different activities and under different circumstances (for example, in the central region of Italy, Silicon Valley, Japan and Korea), which have strong vertical and horizontal relationships.

Rachid (2000) says that some authors use the term "network" to refer to a particular type of organization between companies and **in order to** prescribe how the **organization** should be in order to become competitive. The author adds that the term "network organization" is associated with the logic of collective action, which makes cooperation in the long term feasible. This type of organization is an alternative to hierarchy and the free market. According to Poldony and Page (1997), in a free market organization, relationships are sporadic, created to transfer goods or resources, and afterwards they break down. In the case of the hierarchy on the other hand, relationships are long-lasting and there is a legitimate and

recognized authority to judge and resolve possible conflicts. But in a network organization a set of stakeholders have recurring and long-lasting relationships and the figure of an authority to resolve possible conflicts does not exist.

Castells (1999, p.181) considers two main models that connect companies; the multi-directional model and the licensing or sub-contracting model. The multi-directional model is adopted by small and medium-sized companies when network relationships with other companies, of whatever size, are established with a view to filling niches in the market and to forming undertakings of a cooperative nature. The licensing or sub-contracting model is adopted by large companies when they establish relationships with smaller companies, with a view to licensing or subcontracting out their selling or production tasks. In this case the administrative, financial and technological controls of the relationship remain in the hands of the large company.

Castells (1999, p.183) also mentions a different type of productive network, which is exemplified by a well-known case from the corporate world – the “Benetton model”. In this case Benetton operates through commercial franchises with nearly 5,000 stores worldwide, under the strict and rigid control of the main company. This network model also includes production, where small companies and households in Italy and in other Mediterranean countries are supplied with work. According to the author this type of network organization is an intermediary form of arrangement, falling between networks that arise out of vertical disintegration, based on licensing the selling function, and the multidirectional networks of small companies.

The author also mentions the organizational model of strategic corporate alliances, which consists in the interconnection of large companies. These alliances do not constitute monopolies or oligopolistic-type agreements, because they refer to specific periods, markets, products and processes and do not interfere with competition in areas not covered by the agreement. An example of this type of alliance is the Covisint portal, which is the result of an association between automobile companies at an international level, and also in Brazil, to develop purchasing communities via the Internet, with the aim of reducing costs. The partners in this portal are GM, Ford, DaimlerChrysler, Renault and Nissan.

The concept of Local Productive Arrangements (LPAs) can be considered to be an extension of the concept of company networks, to which are added other institutions that are essential for the setting

up and functioning of these networks. On its website the Brazilian Service for Supporting Small and Medium-sized Companies (SEBRAE) provides the following definition (SEBRAE, 2004):

“Local Productive Arrangements are agglomerations of companies located in the same territorial area, that have a production specialization and that have some interaction, cooperation and learning link among themselves and with other local stakeholders, such as the government, company association, or credit, teaching or research institutions. The Local Productive Arrangement therefore comprises a cross-section of the geographic area (part of a municipality, a group of municipalities, hydrographic basins, valleys, hills, etc) that shows signs of collective identity (social, cultural, economic, political, environmental or historical)”.

According to Cassiolato (2003) the institutional and regional dimension constitutes a crucial element in the process of capacity-building for innovation and production. Different social contexts, rules, legislation, ways of interrelating, ways of learning and ways of interacting between agents are recognized as fundamental when it comes to creating and spreading the knowledge, including tacit knowledge, needed for supporting this process. These peculiarities also lead to different ways of interrelating, which can be both formal as well as informal. The author’s definition of LPAs tries to capture these arguments:

“Local Productive and Innovative Systems are those productive arrangements in which interdependency, interrelation and consistent links result in interaction, cooperation and learning, with the potential to bring about an increase in the endogenous innovative capacity, in competitiveness and in local development”.

The concept of LPA was used in this work because it is part of the objectives of this study to evaluate the role of IT in supporting the setting up of company networks. As has been mentioned, LPAs are types of networks in which public authorities and other entities participate in a joint effort aimed at setting up these arrangements. In the particular case of the ABC region, which has the participation of SEBRAE, the local city administrations and the Intermunicipal Consortium for the ABC region, there is an evident effort in this sense and the signature of agreements to this end is anticipated. It is worth noting that the townships in the ABC region have

an historical identity, which is associated with the industrialization process that happened in this region. The efforts to set up LPAs are all part of this regional context.

4. THE VIRTUAL ORGANIZATION

In this work we also thought it relevant to consider the approach of the Virtual Organization (Venkatraman and Henderson, 1998; Davidow and Malone, 1993). According to this approach a company can use networks of computers that link people, assets and ideas to create and distribute products, by uniting with suppliers and customers (and occasionally with competitors) without being limited by physical location or by the frontiers of the traditional organization. In the same way according to LAUDON and LAUDON (1998), virtual organizations use networks linking people, assets and ideas to create and distribute products by uniting with suppliers and customers (and occasionally with competitors, as well) without being limited by the frontiers of the traditional organization or its physical location.

Venkatraman and Henderson (1998) suggest that virtuality consists in a strategy and that it is evaluated according to three distinct, albeit interdependent strands:

1) The strand, '*interaction with the customer*' (virtual customer), deals with the new challenges and opportunities in the interaction between companies and customers. Currently IT allows customers to try products and services remotely, actively participate in their customization dynamically and mutually create customer communities. The position of the company in this strand is to evaluate how well it is considering the opportunities offered by technology when it comes to interacting with its customers.

2) The strand, '*configuration of assets*' (virtual supplier), focuses on the requirements needed for companies to be virtually integrated in a business network, which is in marked contrast to the vertically integrated model of the industrial economy. The position of the company in this strand is to evaluate how well it is taking advantage of the opportunities provided by technology for structuring and managing a dynamic portfolio of relationships, and in so doing to create and coordinate more easily the assets needed for supplying its customers with value.

3) The strand, '*leveraging knowledge* (virtual work), has to do with the opportunities for acquiring and spreading knowledge within and without the organizational frontiers. The position of the company in this strand is to evaluate how well it is taking advantage of the opportunities offered by technology to leverage different sources of specialization within and without the organizational frontiers.

The 'configuration of assets' strand is associated with the aspect of outsourcing company activities. In principle we can consider that the more the company outsources its tasks the more suitable it is for some type of networking activity. The issue of the level of outsourcing is relevant when it comes to analyzing IT projects, which is what this work will do. For example, according to a study by Silveira (2002), IT managers in companies with a greater level of outsourcing give a lot more importance to EDI (*Electronic Data Interchange*) as a lever for organizational change than IT managers in companies with a lower level of outsourcing. Since EDI is associated with the organizational changes that lead the organization to operate in network we can infer that IT projects based on EDI might possibly favor the setting up of company networks and that this tends to occur in companies that are accustomed to outsourcing.

Therefore the theory of the Virtual Organization constitutes a basis for establishing the assumptions of this work, given that this theory considers that this type of organization is currently a significant tendency. The Virtual Organization model presupposes a high degree of outsourcing of activities, which might possibly lead to the formation of networks, especially subcontracting networks.

5. VALUE CHAINS IN THE ABC REGION OF GREATER SÃO PAULO

In this study we have looked at companies in the ABC region of Greater São Paulo, comprising the municipalities of Santo André, São Bernardo do Campo, São Caetano do Sul and Diadema. The study used the Research into Economic Activities in São Paulo (PAEP) as carried out by the State System for Data Analysis Foundation (SEADE) in 1996, which details the profile of the economic activity in the region.

PAEP reveals that there is a pronounced concentration of industry in the ABC region into sectors, with 38.6% of the industrial added value occurring in the "assembly

of vehicles, trailers and vehicle body work” division and 15.7% in “chemical products”. Among the eight most important industrial divisions in the region (that together represent 90% of the added value in the industrial sector) the following divisions were considered to be very innovative or innovative; vehicle assembly, machinery and electrical materials, basic metal working and chemical products.

The characteristics of the value chain in the automotive sector led us to choose it as the focus of our research. Vehicle assembly plants are the strongest link in the chain in the automotive sector and the most important relationships, for purposes of this research, are those between these companies and their suppliers, which are classified as level 1 or level 2 suppliers. Level 1 suppliers are also called “systemists” because they supply complete subsets to the assembly plants. Generally they are large companies. Level 2 suppliers are parts manufacturers that normally serve level 1 suppliers. Different network and arrangement alternatives mentioned in item 3 can occur in this chain. They can be either horizontal networks (associations between companies on the same level) or vertical networks (the strengthening of links between the different levels in the chain, for example, through the introduction and use of information systems).

6. RESEARCH METHODOLOGY

The question which we intend to reply to in this study is as follows; Can the introduction of information technology work as an element of support for the formation of company networks (or local productive arrangements), with a consequent positive impact on the competitiveness of the companies involved and of the region? In formulating this question we have considered that the reply is of interest to the stakeholders involved – private companies, the public sector and the university. To try and reply to the question we used the research method based on multiple case studies, emphasizing the qualitative and interpretative nature of this type of research (Markus and Lee, 1999).

But the research also has a small component of action research, because we resorted to a resource that might have caused alterations in the context of what was being researched, as we comment upon throughout the text. According to Mumford (1985), one of the methods for collecting the necessary data in order to test hypotheses and to reply to the

questions proposed is action research. In this approach the researcher not only collects information for his or her use, but there is also some positive intervention in the situation being researched into.

Four different stakeholders took part in this research. The first stakeholder is the university, as coordinator, and is represented by an institution located in the ABC region, with the support of another institution located outside the region. In the long term the university is proposing to act as the intermediary in the relationship between the companies that are promoting projects and the local government, by seeking subsidies and facilities for introducing IT projects. Private companies constitute the second stakeholder and the main focus of this work. The third stakeholder is comprised of the city administrations of four municipalities in the ABC region, Santo André, São Bernardo do Campo, São Caetano do Sul and Diadema, as represented by their Secretaries for Economic Development. The participation of local government is mainly through their explicit support for making the projects a reality, in the form of support actions. The companies taking part in the research were indicated by the city administrations using a choice criterion based on the identification of ‘anchor’ companies, which are large companies with a strong presence in the value chain. This approach considers that ‘anchor’ companies would indicate suppliers or customers with whom they imagined they could develop viable IT projects in order to contribute to the development of company networks. The IT supplier companies go to make up the fourth and last stakeholder, because they are potential agents for facilitating the introduction of the IT projects necessary for supporting the formation of company networks.

The steps in the research were as follows: (a) contact with city administrations, including inviting and asking them to indicate the ‘anchor’ companies; (b) contact with IT managers or directors of the ‘anchor’ companies and with representatives of companies that supply IT; (c) the realization of an event sponsored by the university that brought together the different participants in the research, and; (d) interviews with the IT managers from the companies.

In the initial contacts with the city administrations, ‘anchor’ companies and IT suppliers it soon became apparent that there were differences of interpretation and understanding between the stakeholders involved as far as the concepts of company networks and local productive arrangements were concerned.

Furthermore, the stakeholders involved in the research also had no perception of how these themes were considered by other companies and institutions, given that these concepts involve broad and possibly complex relationships. It was also necessary to provide evidence of the interest and support of the local government with regard to the topics in question. Because of this it was proposed that an event should take place, sponsored by the university, which would bring together the stakeholders involved, with the aim of bringing out into the open the perceptions of those involved, improving collective understanding of the subject and identifying ways of bringing together those involved in concrete actions relating to the topic.

The event was followed by interviews with the IT managers of the participating companies, when the questionnaire that can be found in Appendix 1 was used. The interviews were not structured in nature but the 3 part questionnaire served as a guide to doing them. The first part asks for basic information about the organization. It is important for identifying the size of the company, where it is in the value chain and what is the level of outsourcing of its productive activities. This last information is requested in the form of a percentage of their necessary production activities that are carried out by third parties. It is an approximate and subjective figure, but one that allows us to evaluate the level of outsourcing of company activities.

The second part is the essence of the research. In it we have tried to identify those IT projects that are considered to be the source of competitive advantage for the organization being studied, and from them, those whose introduction involves the participation of other companies. In this part of the questionnaire we listed the IT projects selected and for each of them we asked the interviewee to give a mark between 1 and 5 for the following aspects; the importance of the project, the difficulty of introducing it, its stage of introduction and the importance of the participation of partners. The list of projects in the questionnaire is merely a guideline for the interviewer. Initially we presented the general idea of the questionnaire to the interviewee and then we asked him to spontaneously indicate the projects they considered the most relevant. Special care was taken in pointing out the importance of partnerships with other companies when introducing these projects. Only after the interviewees had been through their list were they presented with the questionnaire for their assessment. Occasionally this list ended up suggesting other projects to the

interviewee and these were discussed at the time with the interviewer.

In the third part of the interview process the interviewees were presented with a list of resources so that they could evaluate their importance when it comes to introducing the projects. This list was built up from literature on the subject, using the resource-based approach as presented in item 2 above.

We should point out that the interview questionnaire is appropriate for industrial 'anchor' companies or for level 2 companies in the automotive sector. Because they are large these companies in principle have access to the technology suggested therein, which is not the case with small companies. For companies that are suppliers of IT we used the same questionnaire and asking them to think about their customer companies in their replies. It should be noted that small companies have not been heard at this stage of the research because no 'anchor' companies indicated that we should talk to them, but they constitute an important focus for future research.

7. RESULTS

The city administrations were very receptive when invited to take part in the research. The IT managers of private companies were the least receptive among those we talked to, while IT suppliers were the most receptive of all to our approach.

At the event that was held there were 15 IT directors and managers from large companies in the ABC region, 16 people from IT supplier companies and 4 representatives from the ABC region's city administrations. The debate was useful in the sense that it aired ideas and provided information, but it was not possible to establish any concrete proposals for getting started on any of the projects that fall within the concept of local productive arrangements. Large companies proposed contributing to the initiative, based on their experience with projects that involve relationships between companies. It was also obvious how important it is to establish a channel for an exchange of ideas between IT managers and consultants, and a large part of the debate ended up dedicated to this topic. What we were able to observe from the research is that the topic in question (the use of IT projects as a support for the formation of company networks) is not a priority for large companies. The topic is apparently considered important, especially its regional aspect, but companies do not know precisely how to deal with it.

Generally speaking it was difficult to get information or the indication of partner companies from the IT managers of private companies – in the case of the automotive industry, suppliers were indicated and in the case of the chemical industry, customers were indicated. IT managers argued that this was the responsibility of the sales area and that they could only indicate IT suppliers. We were only able to make contact with the purchasing manager in assembly company C and to get a list of suppliers, which in general were large companies manufacturing automobile parts and located in the ABC region.

A summary of the interviews carried out is set out below.

a) Assembly company A

Assembly company A manufactures automobiles and the interviewee was the CIO of the company. The level of outsourcing was not provided and the IT project spontaneously indicated as a priority was the Information System for Computerized Customs Control in the Industrial Warehouse (RECOF), which is being developed and is based on a web environment. At the present time this project is top priority and the company expects to be at the forefront in introducing it and obtaining a significant competitive advantage. The interviewee did not indicate any IT projects to be shared with partner companies and he told us that as he is already administering a significant number of projects under pressure he considers that a project of this nature would be just another burden for him. The interviewee commented that IT professionals acquire knowledge when they develop strategic (and confidential) projects and that it is common for these people to change jobs and take the knowledge they have acquired to another company.

b) Assembly company B

Assembly company B manufactures trucks, automobiles and pick-ups and the interviewee was the Systems Development manager. The interviewee preferred not to put a percentage on the level of outsourcing in the company but did say that currently this level is low in the production area. He also said that the company has had ‘phases’ of outsourcing but that currently it has reversed this tendency.

The IT projects spontaneously considered as priority are the Globalized Purchasing System (the company is setting up a centralized purchasing center in the country where its headquarters are situated) and the RECOF system, which is about to be developed in-house.

Other IT projects considered to be a priority were chosen from the interview questionnaire. From this list the interviewee stated that the company invests in all of them and gives importance to practically all of them, but especially to the company’s ERP system. The company has had executive information systems since the 80s. It gave little importance to its Internet sales site saying that the main automobile produced by the company is different and that therefore the company considers it must put a “sales-person face to face with the customer”. The assembly company focuses mainly on producing trucks and according to the interviewee it is particularly in this line that sales via the Internet are not considered. The sale of trucks is supported by a system developed by the company in-house and “the competition wants to steal it”. With this system the sales people go out to the customer armed with a laptop and the system allows them to put together the truck specification. The system also offers a series of other resources, including data conversion and a technical catalogue.

The interviewee was skeptical about projects in which the participation of partner companies might be considered important. In none of the projects that he talked about (spontaneously or otherwise) did the interviewee consider the participation of partners to be important. We found this interesting. According to him, when the company decides to introduce new technology, it does so alone, and if necessary it also introduces it in its supplier. We were also impressed by the high number of on-going IT projects mentioned by the manager we interviewed.

c) Assembly company C

Assembly Company C manufactures automobiles and the interviewee was the company’s CIO. The interviewee preferred not to put a percentage on the level of outsourcing in the company but did say that currently this level is low in the production area.

The priority IT projects were only indicated from the interview questionnaire list. Among them are: an executive information system, a collaborative product development system, an Internet sales system (the company has a bottom of the range automobile model where 85% of sales are on the Internet), a data mining system and a web-based training support system. It is interesting to observe that the interviewee did not consider the purchasing area as a priority as far as projects are concerned. With regard to projects in which the participation of partner companies is considered important the only case mentioned was the collaborative product development system project.

In this case the issue of additional resources for the success of IT projects was evaluated by the interviewee, who gave great importance to human aspects, such as the commitment of the CEO to IT projects. In the same way the relationship of the IT area with user areas was another additional resource considered to be very important.

When asked about the possibility of the assembly company carrying out projects that could be shared and could favor small companies, the introduction of invoices using laser technology was mentioned. This project, instead of being undertaken by the company, could be directed towards IT solution providers and after its development for use by the sponsoring company; it could be sold to small companies. According to the interviewee the sharing of projects is considered difficult because when a large company carries out a project it analyses the benefits to be gained and invests without needing help or financing. On the other hand the same situation for small companies proves to be more difficult and therefore from their point of view the sharing of projects would probably be welcome.

The prospect of large companies acting as 'godfathers' for encouraging innovative projects and local productive arrangements is considered remote. In the interviewee's opinion the setting up of networks of companies of the same size is much more probable, to the extent that it is evident that all would benefit from this type of undertaking. He also pointed out the intrinsic restrictions that exist for the large companies to act as 'godfathers', due to the high level of competition. In fact companies do everything in their power to ensure their projects do not become public knowledge until they have been introduced.

The prospect of large companies becoming involved in shared projects considered non-innovative (for example, EDI for small suppliers that as yet do not have this technology) was also not considered immediately feasible. The company considers that these smaller-sized companies should demonstrate their interest in an undertaking of this nature, which sounds incoherent. It is worth noting that currently the company's suppliers are subject to EDI, in other words, in order to become a supplier it is necessary to have this technology.

d) IT Suppliers

We interviewed two suppliers that are companies that have their headquarters in São Paulo, but who predominantly operate in the ABC region. Their customers are for the most part small and medium-sized companies and their products cover network

infrastructure and application systems. The interviewees point out that small companies normally do not have even the most basic IT resources, which makes the application of part 2 of the interview questionnaire unfeasible, as was previously foreseen. The interviewees showed interest in taking part in participative IT projects.

When considering their larger customers it is evident that the perception of the interviewees is very different from that of the large automobile assembly companies. In general all types of projects are considered as priority, except those that are highly sophisticated, such as, for example, product development, possibly because these suppliers do not take part in undertakings of this type. The suppliers interviewed consider that the participation of partners is very important in order to make projects in the area of supply chain management (EDI and logistics), Internet sales and IT infrastructure, feasible. In ERP or EIS projects, which are typically internally developed by the contracting companies, the participation of partners is rarely considered. In principle small and medium-sized companies, which are the focus of these suppliers, find it difficult to become involved in business processes that demand relationships between companies, which is reflected in the reduced possibilities that these suppliers of technology have of operating in this context.

We also interviewed a large IT supplier, which is located in São Paulo, and which works heavily in the ABC region. This is a company that originally set up the IT area of one of the large automobile companies and then split away. In this case the interviewee thinks that the IT suppliers would only take part in participative projects involving partners that were smaller if there was to be some significant financial return.

8. CONCLUSIONS

The research described in this article was aimed at identifying IT projects that might be considered to be a source of competitive advantage for the 'anchor' companies researched in the automobile and chemical industry in the ABC region, and the prospect these projects have of contributing to the formation of local productive arrangements.

The main instruments adopted in the research carried out were a debate between IT managers, local government, IT suppliers and university representatives and the interviews subsequently held with IT managers. The interview questionnaire was not applied in its

detailed form because in this step the focus was on identifying strategic IT projects and from them those that were capable of being introduced by way of productive arrangements. The research produced interesting results in the sense of clarifying the issue proposed and allowing us to analyze the assumptions from literature on the subject that were initially considered as applicable within the context of the research.

Initially it was possible to see that executives from the IT area really do identify IT projects as a source of competitive advantage and not as commodities, as Carr (2003) argues. Examples of systems that managers consider can differentiate them from the competition, as is the case with the RECOF system, were mentioned. With regard to these systems the managers pointed out the importance of maintaining the confidentiality of these projects, and the problem of the escape of knowledge as a result of the high turn-over among IT professionals.

The research reveals that large companies have no financial difficulty when it comes to accessing IT projects of whatever nature, but both the IT managers from large companies as well as IT suppliers draw attention to the fact that small companies lack IT resources and for the most part they do not have even the basic resources.

With regard to the issue of IT projects being able to function as support for setting up arrangements or company networks we clearly saw that the large companies are not interested in starting off projects of this type. They suggest that the initiative comes from small companies, which does not necessarily sound coherent or feasible. But in any event, the large companies propose supporting undertakings of this type (without having specified how this was to be) and making available their experiences on this subject. Therefore the assumption that large companies are interested in participating in and developing company networks was not confirmed in the research we carried out, at least when the action mechanism was based on the introduction of information systems.

With regard to the assumptions that outsourcing is welcomed by large companies and that companies with a greater level of outsourcing are more willing to develop company networks, we observed that the large automobile companies we researched are moving in the opposite direction, in other words, towards low levels of outsourcing. Therefore, this is just one more argument that does not contribute in a favorable way to the topic being looked at.

Throughout the research there was a significant effort to identify IT projects that could be shared

with suppliers and customers by “anchor” companies. Despite the intervention and facilitation offered by the university for starting off and developing these projects in partnership with public bodies, it was in fact not possible to identify them and the reasons we noted for this are:

- The ‘anchor’ companies are self-sufficient and when they need systems that are shared with partners, they themselves introduce and manage them. Furthermore, they have the resources and sufficient power to impose their standards in such a way that their “partners” adjust to them;
- Shared undertakings are considered to be a burden for IT areas in large companies, which already manage a significant number of projects under pressure;
- The IT areas of large companies do not always understand that they have a role to play in forming company networks. They have difficulty in identifying partners and occasionally refer the issue to the business area in the company (the purchasing area in the case of automobile assembly companies, and the sales area in the case of the chemical industry).

We can conclude that in the context of this research the prospect of the IT area in large companies acting naturally as an active agent in the formation of company networks, and in so doing contributing to the formation of local productive arrangements, is very restricted. The fact that IT, generally speaking, is considered to be an agent for bringing about and leading organizational change, does not seem to bear any relationship to reorganization involving partnerships and the sharing of projects, within the context studied. Among other things this suggests that in the study of productive arrangements other aspects appear that still need to be studied and understood.

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APPENDIX 1

INTERVIEW QUESTIONNAIRE

1. GENERAL CHARACTERISTICS OF THE COMPANY

Name:

City:

Start of activities:

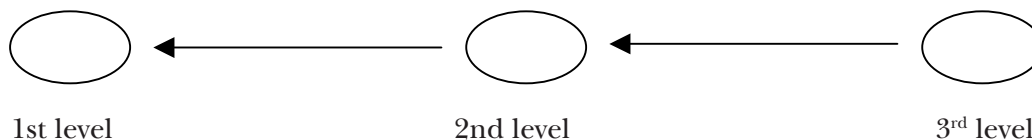
Number of employees:

Main products:

Revenue:

Title of main IT executive:

Company's position in the value chain:



Level of outsourcing: _____% (percentage of activities necessary for the production that is carried out by third parties).

2. INFORMATION TECHNOLOGY PROJECTS

Indicate the score that you consider most appropriate for each project in each column.

	Importance of the project	Difficulty of the project	Introduction stage	Importance of the participation of partners
Management				
ERP	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
EIS	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Data warehouse	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
HR				
People management and 'self service' benefits	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Web-based training	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Spreading information about the company via the Internet/Intranet	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Product development				
Collaborative product Project (locations and participants far from each other)	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
CAD/CAM/CAE	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Purchases				
EDI	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Marketplace and auctions	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Entrance logistics				
Planning, programming and delivery between the company and suppliers	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Operations				
Computer-integrated manufacturing	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Exit logistics				
Planning, programming and loading between the company and customers	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Sales and marketing				
Sales via the Internet	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Data mining	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Call Center	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Others				
	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

3. IMPORTANT ASPECTS FOR INTRODUCING IT PROJECTS

Indicate the score that you think most appropriate according to the importance of the aspect.

Aspect	Importance
That the organization is open and that has open communication	1 2 3 4 5
Commitment of the CEO to IT projects	1 2 3 4 5
Integration between IT and corporate strategy	1 2 3 4 5
IT training	1 2 3 4 5
Focus on business processes and their redesign	1 2 3 4 5
Team-based work and operations	1 2 3 4 5
IT planning	1 2 3 4 5
Effective IT leadership	1 2 3 4 5
Effective relationships between the IT area and the user areas	1 2 3 4 5
Management of partnerships and contracts with IT suppliers	1 2 3 4 5
IT infra-structure	1 2 3 4 5