

ORGANIZATIONAL AND HUMAN CAPITAL DEVELOPMENT IN A HIGH-TECH COMPANY: IMPACT AND SUSTAINABILITY

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ABSTRACT

High-tech companies not only have an impact on the environment in which they operate, but also have a special capability for developing their own human capital in comparison with other sectors of the economy.

The aim of this contribution is to present the results of a company which is a leader in the telecommunication sector in Cuba, from the standpoint of application of a development model based on integrated management of technology and human capital.

I Introduction

Now that the most difficult period of the crisis which the country has been going through since the 1990s is behind us, Cuba's economy is gradually recovering, and we are in a position to resume some of our most important social projects.

Within this context, the Ministry of Computer Science and Communications has set clear policies with a view to improving the quality of life of citizens, in which the informatization of society plays an important role. Obviously, this process will quickly have an impact on the business sector, through the potential investment that will be made, not only internally, but also in those other sectors of the economy where information and communication technologies (ICT) make a major contribution to the establishment and operation of businesses.

For anyone interested in the issue of how ICTs affect organizational results, and especially how they boost the performance of human capital, it is worth mentioning the heuristic complexity of the subject. Nevertheless, there is a wide range of theoretical and bibliographical material, which may be useful as a starting point for anyone embarking on a study of the relationship between ICT and productivity, which appears to be the most pressing question for all the researchers consulted.

This contribution reports on the experience of a medium-sized company in the telecommunication sector, which tallies with some of the results of major research in this field. It should be stated from the outset that we take the approach that ICTs alone do not bring about large-scale changes in productivity or other aspects of the performance of human capital. However, they can be made into a tool for the planning and management of well-defined organizational objectives.

II The company

Gran Kaiman Teleco S.A. (GKT) is a joint venture company set up in 1999 between a Chinese entity and the Grupo de la Electrónica, belonging to the Ministry of Computer Science and Communications of Cuba. Of the 11 overseas companies with foreign shareholding, it is the only one that has managed to move up a level and obtain Bureau Veritas international quality standard certification for all of its processes.

Its mission is research, development, production, engineering, planning, marketing and technical services for turnkey projects, systems, software, applications, technical and organizational solutions for operational security, operation and maintenance, execution of civil and technological works and equipment for communications, informatics and electronics of all types in Cuba, the Caribbean, Latin America and other geographical areas.

The company has a current workforce of 100, distributed among the basic processes with the following breakdown: economic and financial management: 13%, strategic planning: 6%, marketing: 25%, customer training: 2%, technical support and project implementation: 28%, human resources: 5%, logistics: 7%, and infrastructure: 11%. As far as the R&D process is concerned, it has the particularity of being designed and coordinated within the company but implemented through alliances with national entities of acknowledged standing such as technical universities and certification and type-approval centres throughout the country.

As is happening in other "candidate countries" for entry into the landscape of an economy based on the management of knowledge and intellectual potential, access to foreign capital has had a direct impact on investment capacity and has enabled the company to achieve significant development in terms of ICT infrastructure.

In practical terms, the company's level of ICT infrastructure may be broken down as follows:

- staff equipped with IT: 95%
- staff with Internet access: 73%
- staff with international data communication: 81%
- staff with fixed voice communication: 100%
- staff with mobile communication: 62%

The company's ICT distribution policy accords top priority to strategic management processes and processes that generate high added value. In both these categories, this includes 100% of staff involved in technical support and project execution, marketing and, last but not least, strategic planning.

If we look at the company's results over the last three years, we uncover some interesting findings:

- A 14% increase in staff directly responsible for adding value, with a 62% increase in VAB productivity.
- The correlation between VAB productivity and the cost of investment in technology over the last three years is positive, with a vast increase in productivity of up to 49% per year (2006-2007), as against an increase of only 12% in investment in ICT infrastructure.

It is not immediately apparent from the above figures that the company's prime strategy in terms of investment in ICT is not founded on constant updating or expansion, as is usually the case in developed countries, but rather in rationalizing investment and harnessing maximum benefit from installed technology through the intensive use thereof.

III Impact of ICTs on GKT

A host of quantitative evaluations could be advanced, correlating economic and production figures with data pertaining to the company's level of ICT development. At the same time, however, we believe that there are implications directly associated with the way in which human capital is organized and employed which turn out to be just as decisive as the former.

In our case, one of the priority focuses in applying ICTs has been improving the effectiveness of administrative processes within the business, together, of course with a desire to change the structure of productivity, resulting in the most cherished goal of all: efficiency.

More widespread and advanced familiarity with and use of ICTs has made it possible to introduce innovative ideas in the organization and implement the various structural and functional changes that the company has undergone. Solely by instituting complex and enhanced IT workflows and by multiplying its access, processing and communication capabilities, GKT has succeeded in leveraging its impact both locally and nationally and increasing exports by breaking into some regional markets.

These steps have facilitated decentralization and effective on-site decision-making during project execution in areas where access is difficult, thanks to the establishment of work teams with remote assistance and permanent communication with external suppliers and advisers versed in the different product lines.

However, it must be taken into account that, the company's mission being the marketing of telecommunication products and services, it is operating by definition in a very dynamic sector. This, combined with the virtually unlimited demand in the country, has provided GKT with a range of opportunities to emerge as a leader in the sector, where its products will normally achieve a high social impact within a short time-frame.

There can be no doubt that, where the certification and maintenance of the Quality Management System is concerned, the company's level of ICT development has played a key role. The system pervades the organization horizontally, and 56% of the workforce is involved in processes whose fundamental activity is partially or totally computerized.

When we analyse the structure of productivity, quite obviously the major component is the high cost of the work force. This is not only determined by its composition, since its value increases exponentially through an internally dynamic process in which staff become increasingly qualified and the company has to reward them accordingly. This type of reasoning would lead one to believe that the company would have to constantly upgrade its indicators, to a large extent in order to satisfy the salary claims of its employees, but this is not what happens in practice. The average salary within the company is increasing year on year by around 15%, while VAB productivity has grown to 62% by the end of 2007.

Another tangible benefit of equipping the human capital to use ICTs has been a "perpetual motion" effect, in which the learning capacity and potential for exploiting ICTs mutually reinforce one another.

Specialists have had to assimilate technological change rapidly, which necessarily begins with the learning and development of skills required to use technology. There is evidence that, from the very outset, employees have been able to exploit the ICTs available to them as a learning tool and in turn as a means of bringing about an almost immediate improvement in their performance.

Subsequently, the same staff, having become highly qualified through access to expert training, have in turn become knowledge brokers not only within the company, but on occasion, throughout the whole of the Ministry of Computer Science and Communications.

IV Experience in the management of a ICT-intensive company

As alluded to in the introduction to this contribution, we confirm the view of a number of renowned experts to the effect that ICTs constitute a tool for accessing, processing, and taking decisions. If used judiciously, they can have a positive impact on business and human activity.

Accordingly, we set out below a set of points or experiences that we have encountered in our company (not all in the same depth), which we agree constitute variables that have a causal effect on the results described. They are grouped in four fundamental dimensions, which are interlinked and interact, from which variations may be derived for different organizations.

A Planning

- Companies with a significant ICT component should not behave like simple accumulators of technology. They must define a strategy for ICT development and set short, medium and long-term objectives to guide them.
- Working methods must be subject to ongoing evaluation and re-engineering, with emphasis on the interfaces between processes.
- Adequate financial support must be allocated in order to ensure the necessary infrastructure. The key is not so much allocating a large amount of investment as equipping the company with an infrastructure commensurate with its needs.
- As in any planning exercise, it will be essential to measure the impact of actions taken. This will entail defining relevant indicators, reflecting the direct and indirect impact of ICT usage, measurement periods and benchmarking parameters.

B Technological innovation

- Better results will be achieved if the company establishes a technological innovation system to study ICT applications, developments, technologies, integration and convergence, and plans solutions in line with its needs. In Cuba, there is a nationwide push to stimulate technological innovation, which is gradually ushering in more and more solutions based on IT applications rather than conventional methods. With proper organization and encouragement on the part of the management, this has helped companies to overcome their weaknesses, using ICTs.
- Quite apart from the above, at GKT the R&D function is very strong and entirely native. This has enabled the company to develop ICT products which have a genuine impact on society, to replace imported goods, to increase the added value on products in high demand and to develop the company's export potential within the region. In a developing country like ours, it is essential that technological innovation be capable of building and exploiting synergies between the academic, production and technology sectors. To this end, the company has signed collaboration agreements with the country's leading polytechnical university, which includes the donation of an ICT research laboratory. Similarly, it can count on the solid manufacturing support of the electronics industry for the mass production of products developed by GKT.
- Companies should seek to attract technology associates and establish development alliances with world-class partners. In addition to the benefits of foreign funding, companies wishing to rely on ICTs to leverage their business must ensure technology transfer as part of their operations. GKT's associates and suppliers include the most prestigious Chinese firms in the ICT field.

C Human capital

- As a result of ICTs, work organization undergoes significant changes and the makeup of the workforce alters. Aside from the direct benefits of the aforementioned alliance with the polytechnical university, all year round GKT carries out actions designed to motivate talented youngsters to join GKT at the end of their courses. Lectures are given to update students on state-of-the-art trends and ICT applications; students are taken on short internships, and tutors are provided for these geared to the company's actual needs.
- Another aspect requiring special attention within this dimension is training in the use of ICTs. We have our own training centre, whose primary mission is to provide training in technical skills associated with the products and services we sell. However, there are also

classrooms which are used for internal training on IT issues and the creation of skills in the use of ICTs, such that no one in the company is excluded from these benefits.

- Other training actions which have an impact on the company's human capital are conducted with the participation of other MIC entities and the rest of the national education system. These are generally more strategic in nature and highly structured, focusing on areas in which the ministry wishes to strengthen its companies. Other actions are geared to constantly raising the academic level of the workforce, through opportunities for involvement in various types of course.
- Use of the Internet is integrated in the study programmes. As from last year, the company has begun to encourage, alongside compulsory technical training, participation in virtual events, preferably those organized by ITU's Americas Node, of which FORDES is the coordinator in Cuba.
- Information flows are created to foster knowledge management using ICTs. The company possesses three basic tools in this regard: an ERP system on which the whole of the company's operations platform is managed (from the point of view of control of the economic, financial and human resources involved in projects); a national call centre providing 24-hour response and information to enquires relating not only to the services provided to external customers but also to the organization's own internal life; and, finally, an intranet in which services that are vital for the company's operation are gradually being incorporated (payment systems, financial flows, main data bank, shared resources, manuals, etc.).
- Comprehensive management of human capital on the basis of competency profiles. Our profiles see the use of ICTs as the result of a combination of specific cognitive skills. Selection and performance appraisal are examples of subsystems in which the level of development of these competencies are considered, by means of standardized professional tests.

D Information and communication technologies

- Full benefit needs to be derived from investments in infrastructure and access, in terms both of IT equipment and applications. The company's strategy in this regard has been to ensure intensive utilization of hardware, stimulating investment while strictly controlling budgets. As regards software, small-scale software development operations and technical support for networks and applications have been carried out with the company's own staff, while for larger-scale platforms agreements have been concluded with appropriate entities such as the University of Computer Sciences.
- In the area of communications, full coverage has been provided in terms of voice and data access in all posts where it is required for successful performance of the duties involved.
- A final action within this dimension considers the possibility of computerizing all processes within the company, provided that they are suited to this. Ongoing re-engineering as part of management planning is closely linked to this feature, in that every supervisor at all levels is expected to study and propose ways in which ICTs may be applied to manage and solve problems affecting the organization.

V Conclusions going forward

Studying the impact of ICT is a recent activity in Cuba, including within the ICT sector itself. We believe that this stems to some extent from the high degree of rapid penetration of ICTs in the country, as a result of a world order which institutes marked differences between developed and developing countries.

Even so, it is already clear that ICTs have a decisive impact on society and on business, and some initial approaches are emerging as to how the benefits of developing technology can be studied and applied.

In GKT we have observed, both in quantitative and qualitative terms, the effect that ICTs have on organizational development and within individuals. Not only has productivity significantly increased, but specialists are generating more added value with the same resources. Project implementation times are shortening and technical assistance is becoming more targeted and of greater quality, thereby cutting costs. Staff are more efficient and also versatile. We respond rapidly to change, and training in the use of ICTs is having a leverage effect within the company.

The social impact of the company's products and services is being felt in broad and diverse fields, thanks to technology transfer and innovation. Building on this, other companies in the industry have been revived, and new sources of employment are being created. ICTs have also encouraged the company gradually to enter highly competitive markets, and to participate actively in ALBA regional integration projects.

At the same time, we are of the opinion that ICTs are not the only factor contributing to increasing productivity, and business managers must therefore consider taking action in terms of planning, organization, innovation and management of their human capital, as an essential complement to any investment in infrastructure.

Finally, we are convinced that ICTs are a powerful tool for enabling a country or organization to base its development on knowledge management.

However, achieving sustainability of the system does not depend so much on the level of technological development as on how the technologies are used. Whence the crucial role played by the reasoning and creativity of individuals and their desire to contribute, as well as actions by administrations to implement policies to ensure the inclusion of all individuals by creating opportunities for the use of technology.

I should like to express my gratitude for the opportunity to present GKT's modest experience in building a flexible and agile system for anticipating and planning the significant impact of ICTs on the company and its human capital, and I invite you to take advantage of our experience for the benefit of the telecommunication community as a whole.

Thank you for your attention.

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