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A TECHNOLOGY PARK MODEL FOR THE GLOBAL SOCIETY

Director General of the IASP since 1996, Luis Sanz has a large experience is Science and Technology Parks. He was member of the founding team of Valencia Park Technologic, and has been Vice-president of the Spanish Association of Science parks, president of the IASP European Division and International Vice-President of the IASP. He has co-ordinated the organisation of 18 international conferences on these topics and published many papers and articles. Luis Sanz is also a private businessman, journalist and aviation pilot. He speaks Spanish, English, Italian French and Dutch.

CONTENTS

Executive summary:

Science and Technology Parks have an important role to play in the Knowledge Economy. We are already witnessing the evolution of the traditional models into new ones.

One of the models that will have a greater impact is what could be called a 'Learning Village'.

This model comprises three main elements: (i) businesses, (ii) educational centres and (iii) residential areas, and their most important infrastructure will be IT-based.

The integration of these three elements will multiply exponentially the efficiency of Technology Parks.

The presence of the latest IT-based infrastructure and its extensive, every-day-use,will enable its inhabitants to live, learn and work in clearly identifiable geographical units, and yet be fully integrated into the new global society. Learning villages will be inhabited by so-called 'globapolitans with roots'.

This model may also serve to ensure the interest and 'loyalty' of Science Parks' stakeholders, contribute to enhancing the role of Parks as social (and not merely economical) tools, and to ensuring its financial sustainability.

A more extensive résumé can be found at the end of the paper.

There is little doubt that Science and Technology Parks (STPs) have been a highly innovative tool in regional development policies.

The success of this concept accounts for the ever increasing number of STPs all over the world. Of course, during the approximately four decades since they have been in existence, STPs have had to adapt to the various different levels of economic development in different regions and cities, as well as to very different cultures, social and political institutions, and wealth in terms of social capital[1]. This variety of contexts and milieus has inevitably produced different STP models, and none of them can really claim to be more successful than the other, since successes and failures can be found within them all.

THE NEW CONTEXT…

Today we are witnessing an amazing acceleration of historical processes and of social and cultural changes, very much based on the breathtaking IT revolution and, therefore, it is pertinent to ask ourselves about the relevance of STPs within this new scenario. A scenario (i) which is global and yet crowded with anti-globalisation movements (the paradox being that most of this anti-globalisation movements are themselves global), (ii) which has created a new environment, "the cyberspace", which we call virtual simply because it is not geographical, but which is, in fact, quite real and allows not only information and communication to take place, but also action[2], (iii) which raises doubts and questions about the role and legitimacy of states and governments, (iv) which is increasingly dependent on science and technology, and consequently on knowledge, (v) which demands, more than ever before, a very high level of training and education and very solid skills from the individuals so that they are able to perform efficiently, (vi) which is dramatically changing the type of work, and worker and company profiles, (vii) which has promoted networks and networkers to a pivotal position, (viii) which has given birth to a new species –the 'globapolitans'[3], who are like modern centaurs – half physical, half virtual, speaking languages and living in airports and in websites, inhabitants of the "space of flows" (Castells, 1998 ['96]). In other words, a whole new set of rules and situations is resulting in an interwoven world and society of astonishing contrasts, lights and shadows, which many find threatening and others, myself included, risky but also at the same time intriguing and fascinating, although not necessarily fair.

THE RELEVANCE AND SUSTAINABILITY OF STPS…

Will STPs play an important role in such a scenario?

I argue that they will, as long as they maintain the innovative and pioneering spirit and the clairvoyance that is at the root of their success. STPs introduced (innovated) new ways of fostering links between universities and industry; they were pioneers in the creation of areas for non-polluting activities; they introduced high quality master plans containing important elements of architectural and landscaping design that changed the sad and ugly low standards for ever that were commonplace for industrial zones before STPs appeared; and they contributed enormously to the development of new methodologies for the creation of new businesses (incubation and spin-off processes, for instance, in tight co-operation with business incubators).This is the kind of spirit, creativity and inventiveness that must be preserved and encouraged.

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1 By "social capital" I refer to the set of social networks, conventions and norms that may affect the performance of individuals and organizations in a given community or region. "[Social capital]… encompasses the norms, values and beliefs which are shared in everyday interaction within social networks and which enable the co-ordination of action to achieve desired goals" (Woolcock, quoted in OECD 2001).

2 Forms of cyber-action are, for instance, on-line stock-market operations, e-commerce in its multiple variations (B2C, B2B, etc.), on-line training and education, etc.

3 This relatively new kind of individual is an evolution of what used to be known as 'citizen of the world' or a 'cosmopolite'. Yet, the globapolitan has the enormous power of the new IT at his disposal, which multiplies his capabilities, his speed of action and information and the places (real or virtual) within his reach. It would probably be accurate to distinguish between the "virtual globapolitan" and the "globapolitan" as such. The former is globapolitan by virtue of his command and intense use of the Internet and other IT-based tools; the latter shares such abilities and habits, but his very frequent travelling around the world is not only virtual but also real: his mobility embraces both the cybernetic and geographical space simultaneously. Being a globapolitan presupposes, and at the same time engenders and improves, certain skills (digital literacy, command of languages, high cultural-adaptability) and a particular 'attitude' and vision of the world that are increasingly divergent of those of the more standard citizen (or "locopolitan", if you like).

Some older STPs need revitalization, which will only happen through in-depth strategic thinking and re-engineering. New STPs must make sure that they are designed, from the earliest stages onwards, according to the characteristics of the new society and economy which we are in the process of creating.

THE PRIORITIES: CUSTOMERS AND STAKEHOLDERS…

The goal of all this is, of course, to enhance the efficiency of STPs as engines of development through innovation and entrepreneurship in the new Knowledge Economy. To do so, they must: (i) focus on their customers to serve their needs, and (ii) ensure the loyalty of their traditional stakeholders, such as regional or municipal governments, universities, etc. and perhaps even attract new stakeholders.

With regard to customers, STPs should work under the assumption that their client portfolio is growing, diversifying and changing. Until recently, the clients of any STP were mostly companies, and, to a lesser degree, some institutions located within the Park. However, in the very near future, other segments and elements of society may become also users of STPs, for instance, students, teachers, professionals and tele-freelancers (and their families) etc.. If this is true, it seems obvious that the traditional model of STP should undoubtedly be revised.

EXPANDING THE TECHNOLOGY PARK CONCEPT: THE 'LEARNING VILLAGE'…

The central issue of this 'revision' is the integration of businesses, educational centres, and residential and services areas within a spatial unit.

This integration will produce (or better still: is producing) a new concept, which could be called a Learning Village (LV)[4], since the main common feature of all its inhabitants and users, whether individuals or organisations, will most likely be its continuous integration and participation in knowledge-creation, knowledge-acquisition and knowledge-distribution mechanisms through life-long learning processes.

With regard to stakeholders, STPs must maintain their trust and stimulate their support by designing strategies that focus on long-term sustainability. These should be based on a careful combination of a solid practical approach, together with ambitious vision, which is capable of generating enthusiasm.

The economic sustainability of the new LVs will be based on many different resources: real estate operations and service fees[5] will certainly be important and will generate enough revenue so as to nurture the confidence of stakeholders and attract the interest of private investors, and also allow reinvestment in value-added tools and services that are crucial in the Knowledge Economy to take place. Special importance must be attached to seed-capital funds, which all LVs should implement. It is precisely these kind of tools that will make LVs effective projects in bringing their regions into the Global Knowledge Society and by contributing to their competitiveness and balanced growth.

However, before going any further, let me emphasise that the real estate element that

4 I chose the expression 'Learning Village' because it implies a more pro-active attitude than simply 'Knowledge Village', which was another obvious possible choice.

5 Just to give an example of how diverse the sources of income may be, consider the following: any fully developed STP/Learning Village with a total area of just 120 hectares or above, which decided to charge all its regular 'users' (excluding its permanent residents!) with a parking-fee as low as half a Euro per day (in exchange for their own reserved parking place) could easily generate a 'parking income' of around €700,000 per annum: I don't know of any STP manager who would not give such figures (for such an easy-to-manage item) some serious consideration.

will be present in these LVs, no matter how important it may become, must never distract the managers from their real technopolitan job, which is: to foster innovation among businesses, enhance technology transfer, and support small and medium size enterprises (SMEs) in their networking, knowledge management processes and internationalisation efforts. In short, they need to make sure that they create a high value-added for their resident companies and competitiveness for their regions. I strongly argue for maintaining these two aspects –real estate and technopolitan management– as distinct business-units, which would each be managed by different teams.

In this paper, I intend to explore some of the features of a next generation of STPs, by first identifying some of the new problems and needs that will have to be addressed and solved. I want to emphasise that I am not foraging out into unchartered territory here, since the model that I will examine is already being developed in different parts of the world, and within the IASP network.

E1, E2, E3: THE EVOLUTION OF OUR HABITAT…

The "three environments" (habitats) hypothesis depicted by Javier Echeverría is a useful one to enable us to visualise the evolution that has led to the present scenario. His hypothesis –as I would summarise it (goes as follows:

Traditionally human beings first lived in a "natural environment" (E1), and later on in an "urban" environment (E2). However, today, the extraordinary development of the information and communication technologies (ICT) is creating a dramatically new and different 'third environment' (E3).

Whereas the first two environments are linked to very clear and identifiable territories, E3 is trans-territorial, tends to be global and to abide by neither geographical nor political boundaries. Even the concept of citizenship changes in this third environment. In E1, the main mark of identity was given by the birthplace or by the family where one was born ("I am from…"). In E2, the concept of "residence" becomes more important, and it is added to the genealogical marks of identity ("I live in…", –or "I work for…", as in Japan, for instance–). In E1 the physical aspect of a person is very important for identification purposes. In E2 we see a higher complexity (names and surnames, passports, postal codes, etc.).

However, in E3, the birthplace or the addresses are becoming quite irrelevant. Rather that "I am from", or "I live in", the issue now is "I am connected to". The e-mail address or the IP numbers are becoming more relevant for professional purposes than perhaps the name or the residence of the individual (Echeverría, 2001).

In other words, ICTs are creating a new "space" within which human beings can live, work, learn and communicate. In E3 the concepts of "centre" and "periphery" are no longer geographical ones, being defined instead in terms of "connectivity" to The Net.

I believe that this new environment exists "in addition" to the traditional ones (my region, my city, my home). It will not wipe them out, nor substitute them; it will simply be "another" space available to us. Yet, it is important to realise that the third environment will affect the others' role, and it will most certainly diminish their relative importance. In other words, it will not eliminate them but it will change them significantly. In a recent (and not excessively optimistic– article, German sociologist Ulrich Beck talks about the globalisation of [people's] biographies (Beck, 2001). He contends that in the global age our lives are no longer attached to a single place but that have become nomadic and trans-national. This fact implies a sort of loco-polygamy: people are committed to several places at the same time, not just to one place, which means that

personal lives are [now] becoming global lives.[6]

Of course, this new environment is not being developed at the same speed all over the world. Some regions have gone into it faster that others, and even within a region, country or city, some individuals belong to it and some do not. Some are already "globapolitans" and others have not yet reached that status-quo, either because they cannot, or because they do not want to.

It seems quite obvious that this new scenario has created new conditions and needs that STPs must meet. Companies are different, markets are different, jobs are different, and so are the interests and needs of people. If so many aspects are different, the new STPs will need be different too.

ADAPTING TO THE NEW SCENARIO…

A short list will, I believe, suffice to convey the idea of the great number of changes happening under our very eyes, and to give some clues as to which features many future STPs will have:

• Companies are very flexible, open and internationally-minded.

• Finding and retaining highly trained personnel is one of a companies' top priorities.

• Telework (in its various forms) may grow in some ad hoc spaces such as the new LVs[7].

• In advanced economies, quality of life (and the 'place' where one lives plays a crucial role in this) is not only a wish but a requirement.

• People want to become less car-dependent.

• Education and training have become essential both for individuals and for organisations. Moreover, education needs be a life-long process.

Globalisation not only alters space, but also time, for there is no longer "a time to learn" and "a time to work", but a whole (adult) lifetime to study, enjoy, produce and learn… on an enriching continuum.

All this requires many innovations within the places we live in, the premises we work on, and in the way we study and learn. For instance:

• The possibility of living near the work place, but in areas and houses equipped with the best IT infrastructures that would ensure an easy, fast and low-priced permanent connection to the Internet. This would reduce time and costs of transportation enormously (not to mention the stress-reduction benefits), setting the residents free of car-dependency in a significant degree.

• Educational areas where students will not be living within an endogamy regime. We need university campuses where teachers and researchers, but most of all students, may be in natural and every-day contact with companies and professionals, instead of being confined within the bounds of their 'safe and cosy' campus for a number of years, until they are deemed ready to break the shell and go out into the 'real world', which they have been told is inhabited by some weird and threatening species called entrepreneurs and businessmen.

• Such proximity will foster new educational schemes and programmes, and will enhance the growth of new types of universities, such as the entrepreneurial universities, for instance, that will complement the role of the more traditional ones (which, in any case, need to undergo in-depth transformations).

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6 Sentences in italics, in this paragraph, are my own translation of the Spanish version of Beck's article.

7 The telework issue is the subject of many debates. Although this phenomenon seems to have developed to a much lesser extent than was expected, I contend that it will grow, provided adequate conditions exist to neutralise its negative aspects.

• Moreover, this early, frequent contact –not just between 'Academia' and 'Industry', which are often regarded as abstract entities– but amongst the individuals of these institutions, i.e., among students, researchers, professors, entrepreneurs, CEOs and managers, will most definitely contribute to improving employment-seeking and head-hunting mechanisms. The kind of environment that LVs represent will serve to enhance to a great extent dynamic and innovative job-offer/demand systems where firms and universities will co-operate in setting pre- and post-graduate programmes for students, such that they are required to fulfil part of their academic training in performing actual management tasks or in conducting research projects within companies.

LEARNING VILLAGES MATCH THE REQUISITES OF THE NEW WORLD WE ARE BUILDING…

In other words, the soil is already well ploughed and prepared for seeding this new Learning Villages, which, in addition to the zones for businesses and companies and areas for educational institutions and residences, will have to incorporate well-designed service areas, both for companies and for the resident families.

A close examination of the current traditional technology parks will highlight, in contrast, some of the characteristics of the new LVs. One of the most well-known Technology Park models can be described in terms of the following 'external' features:

• Located outside the city (20 to 30 Km. from the centre is a typical distance).

• Public transport, linking the Park to the city, exists, but is often insufficient.

• Low density development (30% of site cover is not at all unusual).

• Subject to rigid legal norms regarding the 'classification' and use of the land, which make substantial changes in the STP master plan quite arduous and time-consuming, if, indeed, possible at all, thus severely limiting the responsiveness of Park managers to the quickly arising new needs and demands of the market.

• Occupied only by working-spaces (firms, incubators, labs, institutions), which means that it is inhabited only by one segment of population: the employed adult.

• Inhabited only during work-hours, and nearly lifeless the rest of the time. (At the moment, for instance, STPs remain empty after working hours. Could such great investments in landscaping, in all kind of infrastructure, in security and surveillance systems, etc. not be better used and exploited?)

I think that some of these features need to be changed. Integration of the following is now at stake: of different segments of the population (different age groups, different levels of skills and training), of activities (mature companies, incubated companies, faculties, research centres), of areas (agorae, social spaces, sports areas, malls, student residences, houses, golf courses), etc.

The integration of all these elements allows (and requires) audacious master plans together with high quality landscaping of course. In fact, the new LVs are more than just spaces that adapt to the new scenario: they stimulate and enhance its most positive features!

Of course, the LV model is not the only possible evolution available to STPs. In the future, just as today, we will see many different models. However, I believe that the "Learning Village" concept will be one of the most innovative and important ones.

BRICK AND MORTAR IN THE DIGITAL AGE?… LVS AS 'MEANINGFUL UNITS' OF THE GLOBAL SOCIETY…

This model may appear to be somewhat of a paradox, since it highlights not only the "soft" elements, but also the "hard" ones

–such as landscaping and real estate aspects– as being something meaningful in a digital world. And yet, I see no paradox. On the contrary, strongly IT-based LVs may become places where individuals will develop new and more complex roots and marks of identity suitable for a global/digital world. These marks of identity will match the features of the "third environment" without eliminating those other marks of identity that make up our umbilical cord to the more traditional habitats such as the city or neighbourhood. These new LVs (and here we are talking about the new generation of STPs), can become "meaningful units" within a global society in that they can be global but locally-rooted, nurturing a new generation of people who feel perfectly comfortable being global citizens, at the same time as retaining their solid marks of identity (glocalisation).

In other words, this new LVs could give birth to real "globapolitans with roots", thus helping to overcome the dangers of a certain schizophrenia that may result from the global vs. local dichotomy[8]. After all, 'globalisation' – a concept which is often associated with "large-scale", "external", "overpowering everything else"– can only be understood within the specific, the small-scale, and within our own lives and cultural symbols. As such, the 'global' cannot be understood without the 'glocal' (Beck, 1998).

We can also regard these LVs as primary units of the learning regions, since, after all, the new 'networks', the 'interaction processes between learning and working and between individuals and organisations', the 'creation and proliferation of nimble innovative businesses', i.e. all the ingredients of the Knowledge Society, need to crystallise in ad hoc places or spatial units where they can take place, and from where they can, in turn, connect to the cyberspace.

These LVs represent places of synthesis and integration between the old and the new world, the atom and the bit. They may well contribute to a large extent to meeting one of today's greatest challenges, which is finding a healthy balance between preserving a sense of identity, of home, and the new global society. Some may find such a balance by opening large, generous windows to globalisation from their own homes. Others, perhaps, by learning how to turn the whole world into "home". For all this to come true, we must think in terms of areas where people live, study, learn and work, but which have been designed and equipped to allow each and every one of its inhabitants, both individuals and organisations, to access the global world at any time, from any place and at very low costs. We must think in terms of environments where using the Internet and other IT-based tools has become a totally natural thing to do.

Online learning will also be a very important element in the life of these learning villages. In some cases, digital resources will replace traditional teaching methods; in all of them it will serve to enhance them. Some colossal steps are already being taken in this direction, such as the decision of the MIT to make all course materials freely available on the World Wide Web[9].

LVS AND TELEWORK…

The telework phenomenon has probably grown at a much slower rate than was initially expected. Yet, I believe that there is still room for significant development of this type of work, and LVs may, in fact, be the most

8 This is no easy task. Globalisation definitely provokes anxiety in many people, who fear an invisible enemy 'somewhere out there' that may take decisions severely damaging their jobs or community. And they surely cannot be blamed for this!

9 On April 4th 2001, MIT President Charles Vest announced plans to make the materials for nearly all its courses freely available on the Internet over the next ten years, in a move that has been seen by many as an unprecedented challenge to the 'privatisation of knowledge'.<www.mit.edu>.

appropriate environment for this to take place[10].

Amongst the different types of telework, I will refer to two that are most likely to be seen in the new LVs: tele-professionals and tele-commuters.

Tele-professionals are experts and specialists in different fields, usually working on an individual basis or in small-scale micro-companies and who are hired to perform different tasks and assignments (on a freelance basis or similar ways). They are not linked to the companies by means of labour contracts. In other words, there is a client-supplier relation, not an employer-employee one.

The prefix 'tele' in this case is really not that relevant, since these kinds of professionals have always carried out the main part of their job outside the client's premises. However, the new IT now allows them to perform much faster and to interact with their clients in a much more flexible way. Rather than working at their own home or office on behalf of their clients, they now work in the cyberspace, which they share with their clients.

I am convinced that LVs are the most convenient location for these tele-professionals to live/work in. Firstly, because the new LVs will provide state-of-the-art IT connections as well as residences specially designed to combine home and office. Secondly, because the companies and educational centres located within the same LV represent a fantastic business community where new customers can easily be attracted. Working on-line and yet being close enough to eventually "drop-by" the client and have a face-to-face real chat is an unbeatable combination that will produce great benefits for both professionals and their clients. Tele-professionals are a clear target for the residential areas of the new LVs.

The 'learning village' model will also allow major growth and improvement in the telecommuting phenomenon (which is of particular relevance to knowledge companies and knowledge workers(, resulting in great benefits for both companies and telecommuters alike[11]. The LVs may boost the positive aspects of telecommuting whilst minimising its drawbacks.

Among the positive aspects we may underline:

• For the companies that rely heavily on telecommuting: a very significant reduction in costs incurred through office space, energy, furniture, cleaning, etc.

• For the individuals: carrying out their job with less 'formal' constraints being placed upon them, a greater sense of freedom and management of their own time, more flexibility, etc.[12]

The main negative aspects are:

• For the companies: additional difficulties in creating a 'corporate culture' and in reaching a good level of company-employee loyalty and trust. Also the knowledge management within the company may meet additional problems, since having many of their employees scattered about does not favour the transformation of tacit knowledge into explicit one, such that this becomes the property of the organisation and not only of the individual.

• For the individuals: the physical absence of the company premises, which usually implies little contact with colleagues and with the high executives, engendering feelings of isolation. Besides, many telecommuters fear that 'not being seen often' will severely limit their promotion possibilities within the company.

10 The growth of the telework phenomenon may be particularly significant in the so-called "sun-belt" areas.

11 By 'telecommuters' I am referring to employees of a company (via labour contract) working from home, instead of on the company premises.

12 Of course, some people will regard these features more positively that others, but in general terms, the profile of the knowledge worker seems to fit quite well in the telecommuting way of working.

The growth of the telework phenomenon has been slower than initially expected, but this could begin to change with the proliferation of LVs, precisely because they are able to solve its negative aspects. Thanks to LVs, resident companies may have a large percentage of their employees working as telecommuters, who would live in the residential areas of the 'village', within walking (or bicycle) distance of the company premises. This would allow a company to set mechanisms that ensure the physical presence of its telecommuters on the company premises at regular intervals, for example, for meetings, briefings or social acts, thus eliminating the feelings of isolation (the 'pariah syndrome') and thereby generating a corporate culture and identity.

A MODEL FOR THE DEVELOPMENT OF OLDER CITIES…

The LV concept may also be a very interesting solution to the growth, expansion and development of older cities that are embarked in the redesign of their vital spaces, and even the very concept of "city" within the global knowledge-based era, and it certainly deserves the careful consideration of urban planners, architects and human geographers. Let us consider for a moment the possibility of a number of interconnected LVs surrounding older cities in a sort of modern digital/knowledge-based "asteroids' belt" of Learning Villages!

EXAMPLES:

The evolution of the traditional Technology Park towards these new and more integrative or holistic formulas is already happening. Within the IASP network, for instance, we know of an increasing number of such projects. The following are examples of some of these:

AUSTRALIA

Technology Park Mawson Lakes. http://www.techpark.sa.gov.au/

Managed by Land Management Corporation, this project, whose origins are to be found in the 'Multi Function Polis' concept, aims at a strong integration between the business, residential and other components at Mawson Lakes. The theme is live, learn, work and play. The nucleus of the project is the 70 hectare Technology Park, around which a urban and economic development of some 620 hectares is being developed. This development is strongly IT-based and knowledge-oriented, and it will host a community of 10,000 residents, 5,000 students and 6,000 workers. Such figures should be certainly able to provide vitality and sustenance to the project.

Other highly significant elements of the Mawson Lakes project are the new Business Support and Innovation Centre (including a technology incubator and International Business centre), the Town Centre, urban villages and mixed-used development areas. The 'Enterprise Village" area, which will offer small office-home, office and multi-tenant accommodation, is also worth a special mention.

Education facilities are another key element, including primary schools (ages 6-12), high school (ages 13-17), and a University Campus hosting 3,000 students.

PORTUGAL

Taguspark (Lisbon). http://www.taguspark.pt

Taguspark is one of the pioneers of this concept. A big area of some 200 hectares is occupied by the Science/Technology Park. The rest, up to a total of 360 hectares will host high quality residential area, services areas, hotel, malls and leisure zones (golf included). All this complex is located at only a few minutes of Lisbon downtown.

SINGAPORE

Singapore Science Park. http://www.sciencepark.com.sg

Singapore Science Park (SSP) is starting to move towards the Learning Village concept. Their managers and directors are currently

studying the feasibility of introducing residential and retail elements in SSP.

"The buzzword here is the 'work, live, play and learn' concept . The Singapore Planning Authorities has relaxed their planning rules to allow residential and commercial elements in Science Parks (up to 15% of the total Gross Floor Area) to encourage this concept…

…In a broader sense and casting the net wider, the Learning Village does exist if we look beyond SSP because SSP is located next to the National University of Singapore (NUS), the National University Hospital (a teaching hospital) and there are student hostels within the NUS campus. There are some private residential units surrounding SSP. The challenge for us in the SSP is to integrate NUS and SSP to encourage greater interaction /collaboration so that bothSSP and NUS can be viewed as one big entity. SSP and NUS are owned by different parties. (SSP is owned by Ascendas Pte Ltd, a wholly owned subsidiary of Jurong Town Corporation – a statutory board which develops and manages industrial properties).

Another development which may be of interest is the creation of Bouna Vista Science Hub (which aspires to be the Silicon Valley in the East) and the plan is create a vibrant hub with the works – research, housing, industrial, commercial elements together. Bouna Vista SH is still at its preliminary stage and its master plan is in progress. What is certain and announced is the Biopolis – a biomedical hub within the Bouna Vista SH where there'll be a concentration of life-science research institutes and biomedical companies. Bouna Vista SH is big project and is located near SSP. This project is driven by Jurong Town Corporation…"

Tui Heng Han
Assistant Vice President
Science & Business Parks

SPAIN

Parque Tecnológico de Andalucía. http://www.pta.es/pta/

Driven by the success of its 1st phase, and due to the rapidly increasing demand for space by companies that wish to locate within its premises, the Technology Park of Andalusia (in Malaga) is currently planning a second phase. An audacious master plan foresees the use of the slopes of a hill to create new spaces and buildings for businesses, with special emphasis on the IT sector. Traffic roads will be partially underground, thus minimising their visual impact. A residential area of some 500 home-office units which are fully IT-equipped, will also be built, and centres for tele-training as well as buildings to host high educational institutions and activities are being considered. The hill will be surrounded by an eighteen-hole public golf course, which will be an important element in the attraction of new investments and companies, and which will also serve to reduce the maintenance costs of the park significantly, since the course will be managed and fully maintained by the Golf Federation.

An agora with service centres and malls, acting as meeting point, will articulate the different zones for companies, labs, residences, leisure and educational activities.

SUMMARISING (EXCERPTS):

Today we are witnessing an amazing acceleration of historical processes and of social and cultural changes, very much based on the breathtaking IT revolution, and therefore it is pertinent to ask ourselves about the relevance of Science / Technology Parks (STPs) in this new scenario. An scenario which is:

- Global…
- Has created a new environment, "the cyberspace"…
- Rises doubts about the role and legitimacy of states and governments…
- Is increasingly dependent on science, technology and knowledge…
- Demands a very high level of training and education…
- Is changing the type of work, of workers and of companies…
- Has promoted networks and networkers to a pivotal position.
- Has given birth to the 'globapolitans'…

Will STPs play an important role in such an scenario? I argue that they will.

… to do so, they must:

• focus on their customers…

• ensure the loyalty of their traditional stakeholders…

…their client portfolio is growing, diversifying and changing.

…stakeholders, …reassure their trust and stimulate their support by designing strategies that focus on long-term sustainability…

The central issue… is the integration of businesses, educational centres, and residential and services areas within a spatial unit … This integration will produce (or better: is producing) a new concept, which could be called a Learning Village (LV).

Of course, the LV model is not the only possible evolution available to STPs. In the future, just as today, we will see many different models. However, I believe that the "Learning Village" concept will be one of the most innovative and important ones.

The economic sustainability of the new LVs will be based on many different resources: real estate operations and service fees will certainly be important and will generate enough revenue so as to nurture the confidence of stakeholders… and also allow reinvestment in value-added tools and services that are crucial in the Knowledge Economy. Special importance must be attached to seed-capital funds, which all LVs should implement…

…the extraordinary development of the information and communication technologies is creating a dramatically new and different 'third environment' (E3)… a new "space" within which human beings can live, work, learn and communicate.

All this requires many innovations within the places we live in, the premises we work on, and in the way we study and learn. For instance:

• The possibility of living near the work place, but in areas and houses prepared with the best IT infrastructure… setting the residents free of car-dependency in a significant degree.

• Educational areas where students will not be living within an endogamy regime…

The kind of environment that LVs represent will serve to enhance to a great extent dynamic and innovative job-offer/demand systems where firms and universities will co-operate in setting pre- and post-graduate programmes for students, such that they are required to fulfil part of their academic training in performing actual management tasks or in conducting research projects within companies.

Learning Villages may become places where individuals will develop new and more complex roots and marks of identity suitable for a global/digital world. This marks of identity will match the features of the "third environment"... LVs can become "meaningful units" within a global society in that they can be global but locally-rooted, nurturing a new generation of people who feel perfectly comfortable being global citizens, at the same time as retaining their solid marks of identity. In other words, this new LVs could give birth to real "globapolitans with roots".

…LVs…places of synthesis and integration between the old and the new world, the atom and the bit. They may well contribute to a large extent to meeting one of today's greatest challenges which is finding a healthy balance between preserving a sense of identity, of home, and the new global society.

The telework phenomenon has probably grown at a much slower rate than was initially expected. Yet, I believe that there is still room for significant development of this type of work, and LVs may, in fact, be the most appropriate environment for this to take place.

The LV concept may also be a very interesting solution to the growth, expansion and development of older cities.

REFERENCES

• **Albrow, Martin** 1997: The Global Age. Stanford: Stanford University Press.

• **Beck, Ulrich** 1998: ¿Qué es la globalización? Falacias del globalismo, respuestas a la globalización. Barcelona: Ediciones Paidos. Original in German: Was is Globalisierung? Irrtümer des Globalismus – Antworten auf Globalisierung. 1997: Frankfurt: Suhrkamp Verlag. Spanish translation: B. Moreno & M.R. Borrás.

• **Beck, Ulrich** 2001: 'Vivir nuestra propia vida en un mundo desbocado: individuación, globalización y política'. In Giddens, A. & W. Hutton (eds.) En el límite. La vida en el capitalismo global. Barcelona: Tusquets Editores. Original in English: On the edge. Living with global capitalism, (ISBN 0224059378). Spanish translation: Mª Luisa Rodríguez Tapia.

• **Bell, Daniel** 2000: 'Internet y la nueva tecnología'. Letras Libres, Año 2, n. 13, Enero.

• **Castells, Manuel** 1993: 'The Informational Economy and the New International Division of Labour'. In Carnoy, M., M. Castells et al., The New Global Economy in the Information Age. The Pennsylvania State University Press.

• **Castells, Manuel** 1996-98: The Information Age: Economy, Society and Culture (3 Volumes). ('Reprinted 1998 ['96]: Vol.I: The Rise of the Network Society; reprinted 1998 ['97]: Vol. II: The Power of Identity; '98: Vol. III: End of Millennium). Oxford: Blackwell Publishers.

• **Castells, Manuel** 2000: 'Tecnologías de la información y desarrollo global'. Política Exterior, n.78, Noviembre / Diciembre.

• **Delgado-Moreira, Juan** 1997: 'Cultural Citizenship and the Creation of European Identity'. Electronic Journal of Sociology <http://www.sociology.org/content/vol002.003/delgado.html>

• **Echeverría, Javier** 2001: 'Democracia y Sociedad de la Información: hacia un nuevo contrato social'. El Noticiero de las Ideas, n. 5, Enero / Marzo.

• **Friedman, Thomas L.** 1999: The Lexus and the Olive Tree. New York: Farrar, Straus and Giroux. E-book http://ebooks.barnesandnoble.com

• **Habermas, Jürgen** 2001: 'El valle de lágrimas de la globalización'. Claves de Razón Práctica, n. 109, Enero / Febrero.

• **Lubbers, Ruud & Jolanda Koorevaar** 1998: 'The Dynamic of Globalization'. Globus. Globalization Studies Homepage. <http://www.globalize.org>

• **OECD** 2001: Cities and Regions in the new Learning Economy. Paris: OECD.

• **Reich, Robert** 1992: The Work of Nations. New York: Vintage.

• **Romera, Felipe** 1998: 'Technocells'. In Formica, P. and D. Taylor (eds.), Delivering Innovation, Málaga: IASP.

• **Sanz, Luis** 1998: 'Science Parks and the "bit" symphony (Allegro con brio)'. In Formica, P. and D. Taylor (eds.), Delivering Innovation, Málaga: IASP.

• **Sanz, Luis** 2000: 'Becoming Knowledge Farms: the role of Science Parks in the Knowledge Economy'. Paper: Hsinchu Science Park International Seminar, Taiwan, December.

• **Why, Peter** 2000: 'Science & Technology Parks – Are they that Relevant Today?'. Paper: UKSPA Annual Conference, October.