Osaka Renaissance News

No3 February 2004

Welcome to "Osaka Renaissance News" - the email newsletter of Osaka City Government's "Urban Revitalization Task Force".

The Osaka Urban Revitalization Task Force

We are the first *City Task Force* established in Japan to address urban regeneration and revitalization at the same time. For this we are also collaborating with the central government's "Urban Renaissance Program". The role of the task force is to coordinate and promote the set of initiatives that taken together form the Osaka Revitalization Plan.

The Newsletter

The newsletter is published on a monthly basis, and distributed through multiple email channels to spread the word about Osaka's revitalization. The letter is designed to provide more background and analysis about what is happening in Osaka under the theme of urban renaissance. If you have found the information of interest, please forward the letter to others in your network. We want to make as many people as possible aware of the changes going on in this major market, and of the opportunities available.

The Osaka City Blue Print for Urban Revitalization covers:

- Urban regeneration
- Business stimulation (notably through technology clustering)
- Tourism and life-style services
- Education – especially professional and life-time learning
- Foreign direct investment

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Author's Introduction

The success of Osaka's revitalisation strategy depends upon its ability to differentiate itself from other cities competing for investment by developing a unique identity. In the business area, Osaka has selected robotics as the technology field in which it can excel. Our article describes the numerous advantages, which Osaka enjoys in this field. These include the presence of several leading universities active in robotics research, the location of leading consumer electronics companies, which will eventually become the major producers of the new-generation robots, and the solid base of small and medium-size manufacturers, many of whom are leaders in the fields of sensor technology, or specialised components. Osaka has everything it needs to become the robo capital of Japan, and by extension the world. What it still needs is the wider recognition for what it is doing, based on the amount of government support it is offering, so that foreign investment begins to flow, helping Osaka to become a real international hub for robotics. It is near China and Asia, but offers a much more advanced infrastructure and research base than anywhere else in the region, while Osaka and Kansai is of a size that enables new entrants to find their way about and build strong connections quickly. We end our analysis of this sector on a very upbeat note because we think Osaka does have everything, and unlike many local governments' efforts at inward investment promotion, it spells out its advantages clearly in its publicity information(http://www.ibpcosaka.or.jp). When you have read this, the decision to choose Osaka as the location for a robotics investment will I believe look a lot more obvious.

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The Osaka City Revitalization Task Force has commissioned Alex Stewart to author this series of newsletters. He is the president of Alexander Capital Access Co., Ltd., an investment catalyst and communications company based in Osaka. He is also an Executive Adviser to the Osaka City Revitalization Task Force. Questions about these articles can be directed to him at: alex@ac-access.com

OSAKA – ROBOTICS CAPITAL OF JAPAN

In this article we look at the city's plans for making Osaka synonymous with next-generation robotics

Defining the term next-generation robotics

In this article we explain why Osaka is a natural centre of robotics. However, first we need to define the current terminology for "robotics". It is not the technology which built Japan into a manufacturing superpower in the 1980s and earned it the epithet, Robot Kingdom. We are talking about next-generation robots, the ones which are coming off the drawing board now, with names like – social robots, bot assistants, or communication toys (pet robots). This new generation of robots can be left alone to do chores like household cleaning, lifting or carrying hospital patients, and patrolling buildings like security guards. They are almost ready to hit the mass market because computing power is now cheap enough, and the need is increasing, not least in Japan, for new productivity supports to counter the problem of an aging population which wants to maintain high standards of living but cannot find people to provide the services.

Japan is in the forefront of robot development not simply because it uses three times as many robots as the next largest users, the US and Germany, but because there are low barriers to acceptance in the home as work place. The reason often given is that Japanese grew up with a cartoon robot called Atom Boy (Astro Boy outside Japan), created in the1950s by Osamu Tezuka, a native of Osaka, and graduate of Osaka University.

Osaka's robotic strengths

Whether by chance or not, Osaka University is now one of the most important centres for robotics research in the world. It is also through the activities of leading research professors at the university, such as Professor Minoru Asada, that the robot soccer competition, RoboCup, has become well-established inside and outside Japan. It was Osaka University as well that hatched the idea to develop a team of humanoid soccer robots with the goal of competing in the Soccer World Cup (although not until the middle of the century) and winning.

Speaking with Professor Asada about his plans can make one believe that the spirit of the creator Tezuka still inhabits the university.

The reason that Osaka is a natural hub for robotics is due to three things: 1) the high-level of university research, exemplified by Osaka University; 2) the number of small-sized manufacturing (SME) companies with the ability to build or assemble robots. The city is famous for SME manufacturers. It calculates it has 20,000 in the city itself, of which over 150 have a specific connection with robotics (possibly twice that number of robot-related companies operate in the Kansai as a whole); and 3) the presence of Japan's three major consumer electronics companies – Matsushita, Sharp, Sanyo – which will help ultimately drive the commercialisation of the market.

Perhaps the main reason that Osaka is likely to establish itself as a world-class robotics hub is that it has a large number of leading research laboratories dedicated to Robotics Technology. According to the city's researches there are no fewer than 27 RT-related research laboratories located at major universities within a one-hundred kilometre corridor running between Kobe and Kyoto/Shiga, forming what must be one of the most concentrated centres of research activity in the world. The Advanced Research Laboratories (ATR) in Kansai Science City has a reputation worldwide for research on man-machine interface technologies, and unlike many research institutes in Japan attracts a very large proportion of foreign researchers. In the same research park is the Central Research Laboratories of NTT. Together they are at the cutting edge of research into voice, language, vision, and advanced communication systems.

Government and industry support

Recognising it had the key ingredients for a technological cluster, the city formally announced its plan to make robotics the centre-piece of Osaka's industry revitalisation in April 2003. Several things led up to the decision. One was the self-proclaimed World's First International Robot Festival held in Osaka in July 2001, which attracted over 50,000 visitors. Another was the decision by Osaka University to apply for funds under the central government's Frontier Research Program to develop a human-beating robot soccer team. Finally, the business association, Kankeiren, lent its full support to the initiative to make Osaka the capital of Japan's Robot Kingdom.

As a first step to establish its leading position, the city secured the spot to hold the next World RoboCup in Osaka in 2005, preceded by the national championships in May 2004. There will be major robotics fairs at both events, but the 2005 World Cup will provide the real opportunity for the city to showcase its robotics plans.

The city is keen as well to unlock the potential of the university sector. In this respect the city has helped to establish a venture consortium, dubbed the Dream Team, to develop products based on ATR's robot technology, RoboVie, in collaboration with university research laboratories. This is easier to organise because universities in the Osaka area have a reputation for being proactive about tying up with industry. The leaders are Osaka University and the Nara Institute of Technology, both of which

head a Nikkei survey published in February about R&D capability and industry links.

Organisation of networking events has been assigned to the Osaka Business Innovation Centre, which is a business incubator and venture support centre funded by the city and chamber of commerce. The goal of the centre is to promote information sharing and help facilitate business matching. So far the Centre has established a database of people and companies active in robotics, it holds monthly networking events, and publishes Robo-Maga, an email newsletter (Japanese only) with a mainly local circulation of 2,000 subscribers. Kenichi Minoji, who coordinates many of the networking events, is on loan from a private research institute. Being young he has the energy to go without much sleep, which is as well since he has so many points of contact to link inside and outside Kansai.

Links to overseas investment

To build links overseas the city with the cooperation of the Innovation Centre has been arranging seminars for foreign robotics companies since last November to meet and share their ideas and plans with local companies. To date 17 companies or organisations have been invited at different times. The city has also prepared extensive information in English about the robotics market, its structure, and how to contact companies. The information available is almost certainly the most detailed compiled by a local government to promote inward investment, and is a clear sign of Osaka's intent to become a world industry hub.

The main agency responsible for promoting inward investment from overseas is the International Business Promotion Centre (IBPC), which provides a one-stop service and offers support as well for companies after they set up. There are generous incentives to establish operations in the city, including business start up subsidies and rental subsidies. There are other sources of support from other agencies, especially the central government's trade promotion agency, JETRO. The net result is that foreign companies are made to feel extremely welcome.

A foreign venture case study

One foreign robotics venture that fully subscribes to the quality of services available is Floorbotics from Australia, which established an office in Osaka at the end of 2002. Luke Hurley, an Australian, who taught himself Japanese living in Japan, heads the local operation. The advantages he lists for foreign companies selecting Osaka over Tokyo are: the large choice of small and medium size companies with which to develop new products, and the low cost of operation – it is probably competitive too with running a similar sized operation in China or Korea where expat costs are equally high or higher, and the local venture infrastructure not necessarily so developed. As an Australian, Hurley is also quick to point out the importance of the quality of life, where the Kansai region, focused on Osaka, offers much more variety, culture, and opportunities for outdoor pursuits than Tokyo.

Floorbotics is particularly pleased that it has been able to find small and medium size technology companies with which to work. Osaka SMEs operate much

more like western companies, but can be even more friendly and receptive to a newcomer from overseas, especially if the foreign company puts a value on developing a social as well as a business relationship. The irritation of the slow-moving consensus system hardly applies when the nod of the head from the president, who is usually the owner, is all that is needed. Luke sums it up tartly, "in Osaka people use their brains and go out and do things, in Tokyo, everyone pleases their boss".

Floorbotics began with a fairly standard bit of kit, albeit a clever one – a vacuum with an ability to map the layout and obstacles in a room and navigate around them while it cleaned. The problem it found is that Japanese houses are quite small and hardly need a robot help mate to clean the floor. Its Japanese partners set about therefore developing with it a hybrid home assistant, which besides cleaning acts as a security monitor and sends email messages to its owner if it notices something unusual. Floorbotics could only have moved this quickly along its product development curve by being located in the heart of the robot kingdom where it enjoys the advantage that many of the largest manufacturers of sensors and other parts required for making robots see, talk, and move intelligently are located in close vicinity.

Size of market

The potential size of the next-generation RT market in Japan is huge, which is another good reason to have a foothold in what will be the first major market to develop. In 2002, the Japan Robot Association estimated the size of the market at a mere $55m. However, by 2010 it estimates it will reach $7.7bn. It expects take off will occur around 2005 to 2006. Based on surveys of users, the largest market is expected to be for daily living services, that is, cleaning, education, security, support for the elderly, and communications (including toys like pet robots which talk and respond in almost lifelike ways). Daily living services in short could account for 80% of the total. The same association estimates that the overall market for robots will reach over $25bn by 2010, and that it will rival the size of the car industry by 2020. If so, this could mean roll over Nagoya (the Kingdom of Toyota), and welcome to Osaka (the Kingdom of Robo).

Note here as well that next-generation robots belong to the world of consumer electronics, rather than heavy industry. This is where some of Osaka's strongest companies are established, notably Sanyo, Sharp and Matsushita Electric which are grouped in the Osaka-Kyoto technology corridor. The major consumer electronics companies are likely to serve both as customers and integrators for smaller companies, which for the time being will tend to make a lot of the running in developing new robot hardware and software. One reason why smaller companies will take the lead is that there are no standard parts and operating systems, which means production is still at the craft stage rather than the mass production stage. In the meantime, custom-made products can be sold directly through the Internet helping to level the playing field with larger companies which have bricks-and-mortar investments in distribution.

Developing the mass market

Establishing standards and low-cost manufacturing systems is therefore essential to the rapid expansion of the

RT market, especially in the time frames which the Robot Association is proposing. Central government is trying to promote common standards, while leading robot prototypes, such as RoboVie, developed at the ATR research centre in Kansai Science City, or PINO developed by Professor Kitano, who is associated with Sony and also has his own private research association, are available for use as platforms for developing standardised systems more cheaply and efficiently. The proximity of the huge mass marketing consumer electronics giants will also mean that standards will ultimately be driven by what they decide.

Last word

Is anything missing? No, except more participation from companies overseas. This is not a specifically Osaka problem, as there are few international robotics companies active in Japan at all. However, there is clearly a large welcome mat waiting for them in Osaka. Back to Floorbotics. It is enjoying subsidised office space provided by IBPC and is an active participant in all information-sharing events – in short it is treated as an insider. Says Luke, more foreign companies will make the electronics majors take foreign venture companies seriously, and once foreign ventures are active the opportunities will expand even further. The barriers to entry in short are low and the opportunities high.

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