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Visiting the LAMP OF THE EAST
Soaring India-Korea Business Ties


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PRATIBHA PATIL


South Korean President
LEE MYUNG-BAK

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Shout to Korea, Action!

Rise of Humanoids in Asia

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COVER STORY

VISITING THE LAMP OF THE EAST:

SOARING INDIA-KOREA BUSINESS TIES

BY STAFF REPORTER

"In the golden age of Asia, Korea was one of its lamp bearers. And that lamp is waiting to be lighted once again. For the illumination of the East." Rabindranath Tagore wrote this famous poem in 1929, and it was on the minds of many people during Indian President Pratibha Patil's visit to South Korea on July 25.

President Patil took some time out during her visit to Seoul to lay flowers at the new bust of the Nobel Laureate Rabindranath Tagore, which is located in Daehangro in Seoul.

Patil had high hopes for her visit to South Korea. Bucking the recent trend of nations turning away from nuclear power due to fears sparked by the recent Fukushima Nuclear Power plant disaster, President Patil is firmly committed to nuclear power for India. In fact, the deal with South Korea was even more important after the Japanese tsunami, since agreements with Japan had hit unexpected snags due to the terrible events. South Korea also had high hopes, because their goal was to export 80 nuclear reactors by 2030. They are courting India as potential customers in addition to Turkey, Indonesia, Malaysia, and China. South Korea is getting into the nuclear reactor business in a big way. And India could turn out to be their number one customer.

President Patil was hoping to cement agreements that were originally started by Prime Minister Manmohan Singh and Korean President Lee Myung-bak last October at the ASEAN Summit in Hanoi. Just like South Korea is looking to spread nuclear reactors throughout the world, India is looking to import them from many places in the world as well, such as Russia, the US, France, Mongolia, Argentina, Kazakhstan, the UK, and Canada. India's sudden and voracious interest in nuclear technology is due to the lifting of a virtual trade embargo on nuclear technology which had been triggered by the nation testing a nuclear weapon in 1974.

South Korea is rather well-known for nuclear power, and 40 percent of the country's electricity is generated using it. It is expected to increase 16 percent within the next ten years. The country is not shy about using its nuclear power either, as all of the nuclear plants in the country run at 95 percent or higher capacity. Within South Korea, 12 more nuclear reactors are scheduled to come online from now until 2021, almost doubling the current capacity of nuclear power on the peninsula. South Korea is also known to work with a variety of advanced reactor designs. They use small modular reactors, liquid-metal fast/transmutation reactors. They also utilize a high-temperature hydrogen generation design. With their nuclear reactor business going strong, it is no wonder that South Korea has high hopes for its exports.

Warm Reception

President Patil was greeted on her arrival by an honor guard of about 100 young Korean men and women and the beating of drums. The military display also played the Indian national anthem and fired ceremonial cannon fire. During the first part of her visit to Seoul, she was greeted by Korean Second Vice Minister of Foreign Affairs and Trade Min Dong-seok and other officials. Later that day she was the guest of honor at a lavish banquet held at the Korean presidential Blue House. No honor was spared for her visit.

President Patil gave an address on her first day in Korea, affirming the two countries' shared values of democracy, the rule of law, and the spirit of human dignity. Patil emphasized the shared religion of Buddhism, and India's presence when Korea became independent in 1948. She said, "There is a natural empathy between our two countries, as both suffered the pain caused by colonialism."

President Patil also met with representatives of Korea's major companies including LG, Samsung, Hyundai, and Daewoo. She noted that names such as those were household words in India today, and that the positive financial outlook of India's economy – especially its immunity to the global financial crisis – assures Korean companies of an ever-increasing and hungry market for its high-end electronics and automobile goods. Based on the president's words, the partnership between the two countries seemed like a match made in heaven.

Productive Results

Presidents Patil and Lee signed three inter-governmental agreements while she was visiting South Korea. The first agreement was regarding the peaceful uses of nuclear energy, the second was an MoU on media exchanges, and the third was the as-

> President Lee said that the visit and the agreements were “historic” and that it would act as “a milestone, demonstrating that our two countries have now truly become strategic partners.”

surance of social security for people from both countries being employed in each others’ land. India employs many South Korean workers in the construction, steel-making, and automobile industries. South Korea, in turn, employs quite a few Indian engineers in the IT sector. President Patil said, “In Korea, the Agreement on Cooperation in the Peaceful Uses of Nuclear Energy signed during my visit will enable our two countries to cooperate with each other in a new sector.” President Lee said that the visit and the agreements were “historic” and that it would act as “a milestone, demonstrating that our two countries have now truly become strategic partners.” Specifically, the deal allows South Korean companies to negotiate with the Nuclear Power Corporation of India.

These deals are all patterned after the agreement that India signed with the US, after it received a waiver from the Nuclear Suppliers Group in 2008. That was an official, international recognition of acceptance of India only wanting to use nuclear power for peaceful purposes. The agreement with South Korea show that India is taking seriously its Look East policy, and will open up further trade possibilities with other

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Q&A Ms. Anita Arjundas

CEO & MD – Mahindra Lifespaces & Director Mahindra World City

BY RUPA DASH

Anita Arjundas joined Mahindra Group as Vice President of Marketing for Mahindra World City, Chennai in October 2002 and was promoted as its Chief Operating Officer in June 2006. In July 2007 she was appointed as Chief Operating Officer of Mahindra Lifespace Developers Ltd. In April 2009 she was promoted as the president and CEO of Mahindra Lifespace Developers Limited (MLDL). She holds an MBA from Bharathidasan Institute of Management, Trichy and has more than 20 years of experience in the industry. Here are excerpts of the interview she had with Asia-Pacific Business and Technology Report.

Tell us about the evolution and concept of Mahindra World City.

The idea of Mahindra World City traces its beginnings to the late 1990s, when we were identifying a site location for the Ford plant in India. The quality of industrial infrastructure available for vendor parks came up as an unmet need in discussions between the local government, Mahindra, and Ford. And Mahindra decided to venture into this space jointly with the local government through its recently formed real estate and infrastructure company.

This was a time when the business ecosystem in India was changing dramatically – the rapid growth of IT companies began, driving two clearly visible changes. First, the large number of people IT employed formed a new middle-class with suddenly higher incomes and aspirations. This booming domestic market attracted several foreign manufacturers to India. Second, IT also pointed the world's spotlight on Indian talent and ingenuity, which was recognized as both competent and cost-effective.

Meanwhile, the government of India was finding ways to harness the potential of exports as a growth engine for our economy as well as enablers for infrastructure development. The SEZ legislation was enacted, letting us further strengthen our value proposition through Mahindra World City.

We saw that the opportunity we had was to not create just an industrial park, but something of a much broader scope. We wanted to influence the process of urbanization itself. We planned to create a community that one could live in and go to work to, where one could avoid long commutes and still live in open, green surroundings.

Our belief was that the vast pool of skills and entrepreneurial talent in India needed a robust infrastructure platform to realize its potential. To make this growth truly sustainable, we planned to integrate these infrastructure platforms with world-class residential and social developments. Through Mahindra World City, we have redefined the quality benchmarks of industrial real estate and integrated township development in India. The clientèle we enjoy today is a testimony to our success.

We engaged world-leading partners to help us shape this dream, and today Mahindra World City offers world-class business infrastructure and high-end social and residential facilities to form what we call a Work-Live-Learn-Play environment, which makes the perfect synergy between life and work a reality.

Share with us the development at Chennai and Jaipur project.

Mahindra World City in Chennai, spread over an area of more than 600 hectares, houses India's first operational special economic zones (SEZs) to be developed through a public-private partnership with TIDCO, a Government of Tamil Nadu undertaking. Mahindra World City is located 50 km from the center of Chennai city and is a 45-minute drive from the city airport. Mahindra World City Chennai offers high-quality integrated spaces for business, living and leisure. The City has been master-planned by Jurong Consultants and landscape architects Belt Collins, both from Singapore. The award-winning master plan of its residential/social zones has been conceptualized by the world's leading planning and architectural firm HOK from USA.

With three sector-specific SEZs for IT, Auto Ancillary, and Apparel companies focused on exports, and a Domestic Tariff Area (DTA) for companies focused on the Indian market, the location has attracted many global giants, coming together at New Chennai. 58 customers including BMW, B Braun, Capgemini, Fujitec, Infosys, Lincoln Electric, Renault-Nissan, SMC, Timken Bearings, the TVS Group of Companies, and Tesa Tapes among others are operational at the City.

Following in the footsteps of our project in Chennai, the second Mahindra World City is being developed in the northern city of Jaipur, and aimed at recreating our success on a larger scale and scope. We are developing Mahindra World City Jaipur in collaboration with RIICO – a government enterprise focused on promoting industrial development in the state of Rajasthan. Spread over a project area of 3000 acres, Mahindra World City Jaipur has been master-planned by Jurong Consultants, Singapore, and landscaped by Site Concepts, Singapore.

Mahindra World City Jaipur is strategically located on the Golden Quadrilateral, situated off National Highway 8, 18 km from the airport and 21 km from the railway station. The development is demarcated into four SEZs (IT/ITeS, Light Engineering including Auto and Auto Components, Handicrafts, Gem & Jewellery) and a DTA. The project has attracted 37 clients so far.

Mahindra World City Jaipur has also been identified as one of 16 projects globally – and among the only two projects in India – by the Clinton Climate Initiative (CCI), a foundation promoted by Former US President Bill Clinton for sustainable development.

Can you name a few firms that have set up in these SEZ? Especially multinationals?

The special economic zones in Mahindra World City house export-oriented facilities of leading business houses such as Deutsche Bank, Infosys, Renault Nissan, Timken, the TVS Group of companies, and Tech Mahindra among others. They also make world-class infrastructure available to numerous medium-sized Indian enterprises across multiple sectors.

Leading global companies such as BMW, Lincoln Electric, Fujitec, B Braun, EXL Services, ICICI Bank and DePuy Medical have facilities in the Domestic Tariff Areas of the World Cities.

Which sectors and regions are you aiming for with Chennai SEZ?

The special economic zones in Mahindra World City Chennai cater to the IT, automotive ancillaries and apparel, sectors while a demarcated Domestic Tariff Area houses facilities of corporations catering to the Indian market.

Which markets/geographies do you intend to target in the next 5 years and why? And what is your strategy for this?

We are keen observers of the macroeconomic environment and also the economic indicators at a provincial level. This allows us to identify the inherent strengths and potential of different regions, as well as ways in which we can partner in the development and growth process. The philosophy of the Mahindra Group is to be in businesses which enable people to rise. We are constantly researching development formats and target markets where we think we can make the greatest positive difference through real estate and infrastructure.

What are you doing to attract companies from East Asian counties like Korea?

We are working closely with trade bodies like KOTRA, Invest India, and the Indo-Korean Chamber of Commerce and plan to organize Industry specific Road shows at specific locations in Korea. Apart from this, we also intend to enter into joint agreements with the government bodies for setting up country-specific clusters.

What is the status of exports and employment generation from this zone?

The vision of Mahindra World City is to create hubs which add significantly to the socioeconomic vitality of the respective regions. In Chennai, our project provides employment to more than 23,000 people through the companies operating here, and has generated exports of more than US$1.1 billion in the last two years. We seek to grow these numbers significantly as the project reaches its maturity.

We are leveraging our experience from Chennai to develop our second project in Jaipur on a larger scale and at a rapid pace. Today, almost 3,000 people work in Mahindra World City Jaipur, which generated US$30 million of exports in the previous financial year.

Besides SEZ, in which areas of real estate is the Mahindra Group making its presence?

The real estate sector of our Group has a decade-long history of developing residential real estate across major cities of India. Developed and promoted under the brand of Mahindra Lifespaces, our projects were among the first adopters of several practices which today are accepted as industry standards and best practices including being the first green homes developer in India. We operate in multiple key cities across India with a development footprint of 15million square feet across completed, ongoing and forthcoming projects.

What are your future plans for new SEZ or expanding Lifespace vertical?

Mahindra World City has charted its expansion plans in potential growth corridors, including a second project in North Chennai and projects in key destinations in Western India, including Pune in Maharashtra, and other locations across the country.

What is the current turnover of the company? Is there any revenue milestones that you want to reach?

The real estate sector of the Mahindra Group generated US$140 million in revenues during 2010-11, growing at an annual rate of around 30 percent over the past five years. We have demonstrated that innovation, responsible corporate behavior, and robust financial growth can go together. Our vision is to establish ourselves as among the leading real estate developers in India, while strengthening our position as pioneers of development formats and practices.

What are the collaborations/alliances signed and planned, and benefits of the same?

Mahindra World City also owes its success to our partnerships with industrial development authorities of provincial governments, as well as to the heritage and values which we inherit from the Mahindra Group – a US$12.5 billion diversified group with more than 65 years of history and leading presence in a wide range of industries. A-P

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countries in East Asia. India's long-term strategic interests lie in North- and Southeast Asia. It must be able to counter China's influence in the region, and it would be best to become a more influential power compared to the United States as well.

This is part of a larger trend of India playing a much greater role in Asia as a whole. With its historical background of being a major player in Southeast Asian relationships, the country could once again begin to influence the smaller nations around it in ways that it has not done in recent memory. India has spent a long time focusing on itself alone, and internal problems. But now the recent government seems to recognize that the solution to internal problems are external to India, and has begun reaching out to get what it needs to get. This relationship with South Korea is one of those reaches, and promises many more in the future. These moves are even encouraged by the US, who sees India as a potential ally and balancer against the growing influence of China.

President Patil took some time out during her visit to Seoul to lay flowers at the new bust of the Nobel Laureate Rabindranath Tagore, which is located in Daehangro in Seoul. Tagore wrote a poem titled The Lamp of the East which referred to Korea as a star among nations, soon to rise again. The words have been inspirational to the Korean people, and the bust was set up after it was crafted by the master sculptor Gautam Pal and gifted to South Korea by the Indian Council for Cultural Relations. Before she left, President Patil invited President Lee to visit India in the near future.

After President Patil finished her visit to South Korea, she planned to go on to Ulaanbaatar to speak with Ts Elbegdorj about mutual defense and cooperation. However, due to the greatest rainfall that South Korea has received in a century, her plane was delayed for over two hours. A technical problem with the wings of her special Air India jet was caused by excessive rain, and the delay was used to serve lunch.

Good CEPA Times

South Korea and India seem like an excellent match more and more. South Korea needs a market for its exports and India is providing it. South Korea wants to export nuclear reactors and India wants to import them. South Korea has just finished the construction and development to make itself a modern nation, and India is in the middle and could use some expertise. The next thing you know, India might be looking for high-speed trains and South Korea might be giving them a little KTX action. There may not be a better international match other than Canada and the United States. With this visit from India's president, the major obstacles and kinks seem to be worked out, and what remains is a wide-open plain of possibility. Now is a very good time to be Korean, and a very good time to be Indian. A-P

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The Spreading Economic Crisis

BY DONALD KIRK

The sighs of relief that everyone was breathing after the United States Congress finally passed a compromise budget on August 1 quickly turned into moans of agony and derision as the U.S. stock market persisted in its worst slide since the 2008 "great recession."

Clearly the "great recession" has never ended, and the same fears for the global economy persist, perhaps more strongly than ever. The problems this time may be a little different, reflecting grave doubts about the fiscal viability of economies across southern Europe from Spain and Portugal to Italy and Greece and north to Ireland, which a few short years ago was touted as an economic wunderkind.

The ramifications of the seeming inability of the American economy, as the worlds biggest and once the world's strongest, to pull out of financial distress, go far beyond the borders of the United States. Suspicions that the "almighty dollar" is no longer the world's bellwether currency are rife. The spreading malaise through markets in Europe and Asia mean that business and industry will go on slowing down. Even if the U.S. economy picks up temporarily, the disillusionment generated by the terrible divisions in the American Congress, and among Americans in general, gives rise to the fear that the U.S. is in a permanent state of decline, perhaps slow, perhaps rapid.

The fall of America as the global economic leader jeopardizes trade and investment as well as military commitments worldwide. Members of the American Congress repeated again and again that the United States could not forever sustain a budget deficit of more than 14 trillion dollars and debts of approximately the same figure. Next, they will want to act decisively against the enormous American trade deficit beginning perhaps with the yawning gap in trade with China. They also have to slash the U.S. defense budget, compromising the ability of the United States to maintain defense commitments in Iraq and Afghanistan even as President Obama promises to pull out American troops. These moves raise questions about the U.S. commitment to costly overseas bases from Japan and Korea to Germany and England.

As the U.S. and global economy worsens, the differences between rightists and leftists in the United States also deepen with each side blaming the other for America's problems. The budget debate in Congress, which very nearly put the U.S. into default, was only a symptom of the problem. What was one to make of the inability of members of Congress to come to terms? The first instinct was to say that George W. Bush when he was president got the whole system in trouble in the first place when he reduced taxes on the rich or merely the well-to-do. Was he thinking that everyone making more than US$200,000 a year selling used cars or writing advertising copy or shilling for special interests or selling widgets at the corner store really needed a tax cut in order to have enough incentives to go out and make more?

That was one of the prime arguments of the ingrates in the American Congress as they battled tooth and nail against Obama's insistence that somebody, somewhere, somehow has got to start paying more taxes, and it might as well be those with more than enough to do so. Never mind, of course, that the federal government bailed out the highest fliers in the financial world when their firms started tanking during the 2008 global financial crisis. While everyone else was told to make "sacrifices" to weather the financial storm, did any of these people demonstrate such patriotism? No way. They laughed all the way to the bank, or to their second and third homes, thinking of ways to spend their bonuses, stock options and whatever other terms they've got for money they made but didn't earn.

One of the claims of those who are rich and growing richer is that the "bloated" federal government has been wasting too much on handouts like unemployment insurance, social security and numerous other programs. They're calling for reductions that hit the vast majority of America's 300 million citizens, widening a rich-poor gap that is already one of the most pronounced in the world. Let only those who can afford it pay for their own higher educations. Let only those with the money to cover skyrocketing medical costs take advantage of the skills of some of the world's best doctors. Aren't education and medicine the perquisites of the rich? That's the thinking among American rightists whose goal is to jettison policies and programs dating from the era of Franklin Delano Roosevelt, the president who led the U.S. out of the Great Depression of the 1930s and then through World War II.

The reversal of what was known as "The New Deal" has implications for U.S. foreign policy that may not be predictable. But none of the options or scenarios seems pleasant. As the United States battles economic problems, the specter of protectionism might well arise as business and labor together respond to the onslaught of foreign products. The urge to shut off markets could eventually win out over free trade agreements. Tensions could increase as China flexes its muscles militarily, claiming sovereignty over both the Yellow Sea and the South China Sea. Economic fears could interface with militarism on both sides of the Pacific.

The debate in Washington, though, does have a silver lining. It's always possible to view seemingly irreconcilable differences in the Congress, in American state legislatures and in the body politic as exercises in democracy in action. At first glance, that was how many observers saw the budget bill Congress passed at the 11th hour, heading off fears that the United States was really about to go into default. According to this roseate view, all sides managed to come up with a plan that was less than ideal but represented as broad a spectrum as possible. It was hard, however, considering the enormity of the American debt, and the rising budget and trade deficits, to imagine a truly happy ending. The debate carried the seeds of bitter disappointment and worsening problems for the foreseeable future. As markets sank, the feeling was inescapable: if the American Congress had managed to insure payment of debts, it had done little to guarantee long-range or even mid- or short-range economic security.

The United States, to be sure, was by no means entirely responsible for the bleak global economic outlook. A parallel between the current ongoing recession and the Great Depression of the 1930s is obvious. The latter came on the heals of the American stock market crash of 1929 as global economic weakness extended from Europe to Japan. No one should forget the Japanese rationalized the conquest of much of China and almost all of Southeast Asia as the way to compensate for "the ABCD powers," America, Britain, China and the Dutch, which ruled the East Indies, now Indonesia, shutting off the flow of oil into the Japanese economy.

So far, America's economic problems have not stirred up emotions to the point of mass demonstrations, much less violence. Americans, however, are capable of enormous outbursts. Anyone who remembers the protests against U.S. involvement in the Vietnam War or during the civil rights struggle knows the potential for raging displays of discontent on American campuses and city streets. Right now the prevailing sentiment in the United States is that of disgust with leaders and legislators who lack the guts, and the common sense, to place the interests of the majority above those with enough left-over funds to finance petty politicking and reelection campaigns.

Contemplating the range of emotions at play in the American electorate, from far leftist " radicals" to "tea party rightists," foreign observers tend to laugh at the whole spectacle. China's late leader Mao Zedong was fond of denouncing the United States as a "paper tiger," but the image today is that of a wounded beast, thrashing wildly in the jungle, fending off foes in a desperate struggle to survive. At the same time, America's critics, as well as sworn enemies, are finding they too are vulnerable to the vicissitudes of a worldwide drawdown of resources. Suddenly commentators are talking of a "Lehman moment," a reference to the bankruptcy of Lehman Brothers, America's fourth largest investment services firm when it went belly-up three years ago.

Could the woes of a few European countries overwhelm all 17 states in the "Eurozone" – plus Britain, which has spurned the Euro and remained on sterling? The response of the U.S. Federal Reserve has been to consider QE3, the third edition of "quantitative easing" – a fancy term for resolving an economic crisis, or "downturn," by printing ever more money. That kind of solution, however, is no panacea. Yes, the U.S. threw tens of billions into entities on the verge of bankruptcy during the 2008 crisis, but those prescriptions did not come with authorization of refills at the counter. Nor would another attempt at "quantitative easing" seem likely to prove effective given the disappointing results of QE2, which went into effect as the world's 20 most influential economic powers were meeting in Seoul, Korea, last November as the G20.

Hanging over all the calculations of America's financial wizards was the realization that the American public is extremely disillusioned by their maneuvering. Many Americans share the conviction that a number of giant firms, such as AIG, the American International Group, the global insurance empire, might just as well have been left to die rather than recover on federal life support. The American public is tired of treating huge companies with federal funds, guaranteeing more good times for a few top-tier owners, executives and investors but not for everyone else. In the wake of the U.S. congressional budget debate, approval ratings for the Congress fell to all-time lows of well under 20 percent. The "trickle down" theory of economics – the view that money flows down from the top into the hands of the middle and working-class — is highly suspect. Trouble is, many believe there's no reason to expect the economy would fare any better if the worst cases were hung out to dry and die. A-P

Benefits of Korea-EU FTA

BY EUN YOUNG CHOUGH

With years of negotiations, the Korea-EU free trade agreement (FTA) ratification was finally brought into effect on July 1.

The Korea-EU FTA belongs to a different level compared to previous FTAs. Korea has been pushing ahead, among trade deals with other nations, the FTA with the EU has a larger market than the market of the FTA with the U.S., and the trade volume of the Korea-EU FTA is the second largest next to the trade volume expected by the FTA with China. The Korea-EU FTA is the sixth FTA Korea has entered into.

Negotiations began in May 2007. Until March 2009, eight rounds of negotiations took place in Brussels and Seoul. In July 2009, the conclusion of the Korea-EU FTA was jointly announced at the Korea-Sweden Summit at Stockholm. After a year, in October 2010, Korea and the EU signed the Korea-EU FTA at Brussels. The National Assembly of Korea approved the Korea-EU FTA ratification bill this year on May 4th, and soon after the FTA provisionally took effect on July 1st.

The FTA between the EU and Korea is expected to slash tariffs on more than 20,000 items. Starting July 1st, the tariffs of more than 9000 items in each nation were cut immediately, and the rest will be slashed gradually. Among the imported goods made in Europe that had the tariffs cut immediately were shoes (tariff rate 13 percent), leather bags (8 percent), clothing (8-13 percent), refrigerators (8 percent), and vans (10 percent). According to a report by the Associated Press, EU Ambassador Tomasz Kozlowski said the FTA between the EU and South Korea "immediately slashes 70 percent of tariffs and with that set to expand to 98.7 percent within five years." The Korean Ministry of Knowledge Economy estimates that for the next 15 years, the Korea-EU FTA will bring an annual average of US$2.5 billion dollars in the manufacturing exports industry, and an effect of US$400 million dollars increase in trade surplus.

The main beneficiaries of the Korea-EU FTA are expected to be Korean manufacturers and Korean electronic component manufacturing companies. With the open legal market, some legal experts believe that local law firms may suffer a blow from European law firms, but others believe that new opportunities may arise. On the other hand, the agricultural sector seems to have a price stabilization effect for a certain period, but damage in the livestock industry seems to be inevitable in the long run.

As of 2010, the EU was the second largest export market, taking up 14.9 percent (US$68.6 billion dollars) of the total Korean export market. However, Korea aims to increase its market share in the EU from 2.6 percent to 3 percent within three years. Trade Minister Kim Jong-hoon said in a radio interview that this figure is possible since Korea's rival nations need at least three years to conclude the FTA with the EU; whereas, Korea can enjoy the prior occupation effect of the EU-Korea FTA. A-P

Olaf Speier | Dreamstime.com

Packaging Industry:

Part and Parcel of Industrial Growth

BY SHAMILA JANAKIRAMAN

The packaging industry caters to the needs of consumer convenience while providing a longer shelf life for food products and other consumables.

The importance of packaging and the need for advanced packaging technology is proven by the fact that this sector is expected to grow to US$23 billion in 2015, at an estimated CAGR of 8.2 percent from 2010 to 2015.

Modified atmosphere packaging and intelligent packaging represent the majority of this projected growth. Intelligent packaging involves freshness indicators and time temperature indicators, as they are widely needed in packaged food, ready-to-eat meals, and frozen food categories.

Creation of wealth is the major criteria of any industry, and packaging serves that need, while also preserving the wealth created by other industries. It adds value to a product and preserves the quality of products like water, milk, biscuits, medicines, processed and semi-processed foods, fruits and vegetables, edible oils, electronic goods, machinery, and many other products.

Importance of Packaging

Consumer behavior is considered a major factor affecting the packaging industry. The recent economic situation has forced many to look for greater value in all their purchases. So more emphasis is laid on refurbished or upgraded packaging materials and also on green packing. Co-packing and contract-packaging are also gaining importance.

Alternative green materials like sugar cane and bioplastics are being tried out, although procurement may be a challenge. Polylactic acid (PLA) is suitable to packing small quantities of products like salads. Coca-Cola's PlantBottle is one such new entry which may be sustainable and which may eventually change the scenario for all products packaged in bottles.

Consumer preferences are instigating manufacturers to opt for the reformulation, re-branding, and repricing of products to beat out the competition. Here packaging serves as an important differentiator. Although maximum focus is on quality and value, consumers are attracted to innovations in products, packaging, advertising and branding, say researchers.

Packaging helps differentiate brands, as is evident from a plethora of colors, shapes, and sizes of packages in all products from shampoos to the easy-to-carry packages for consumer durables. Color coding, for example, which uses different color packets for different flavors of a health drink, is preferred by most consumers. In short, we can say, "Packaging enhances value."

Manufacturers can also assure consumers of the safety of their food products if the packaging is beyond mislabeling, spoilage, product tampering, contamination, and damage. In this context, RFID-enabled packaging is expected to gain consumer confidence as it improves traceability, especially in the case of meat products. Good packaging also helps companies avoid product recalls, which is a lot more expensive than providing higher-quality packaging in the first place.

Packaging ensures safety, convenience, and enhances the look of a product, making it attractive to buyers. These features increase consumption, and hence economic growth. As plastics are an important constituent for packaging, newer technological developments based on the properties of plastics will result in industry improvements and revenue growth.

Owing to increased environmental awareness, the material used to make packaging material increasingly needs to be recyclable or decomposable. Many communities worldwide have already banned the use of non-decomposable plastic bags with support from governing bodies, grocery stores, and vegetable and fruit vendors.

Multilayer Packaging

The need for low permeability and creative packaging has resulted in multi-layer film constructions. This type of packaging is made of a two-polymer combination structure of resin to function mechanically as a container and gas barrier, which is surrounded on the outside by a barrier resin to provide low permeability.

Such a combination is seen in polyethylene terephthalate (PET) carbonated soft drink or water bottles. The structural resin is PET, which is impermeable, and the primary barrier resin is made of nitrile copolymer. The barrier resin serves to prevent carbon dioxide passage out of the product. Food containers may even have seven layers of materials serving different functions. For example, Nylon resins are oxygen barriers but are affected by moisture, and so are used along with polyethylene.

Polypropylene and polyester are used to make high barrier packaging films. For heat-sealing packaging, a hot melt adhesive film is needed. A film to protect contents that are sensitive to UV may also be required in some cases. To achieve all properties in a good package, a multi-layer film along with a metal film such as aluminum is created, whereby each layer is held together by adhesives providing cohesion.

Adhesives are an allied industry of the packaging industry, as they are required with a certain degree of permeability in most packaging. Very high permeability is required in some cases where free passage of air may be required. In most cases, however, low permeability is needed, as in the packaging food and pharmaceutical products. This keeps out moisture and air to prevent spoilage or damage of product.

Lamination and co-extrusion are manufacturing processes to make multi layer packages. Different types of laminations are available for making pouches for pharmaceutical tablets, capsules, powders, liquids, ointments and creams. In some packages breathable materials may be required to pack foods like green salads, which allow oxygen to enter to increase the shelf life. Polyurethane and thermoplastic elastomer (TPE) resins provide breathability and can be available as free films or as coatings on a supporting sheet like a woven fabric used to make packets for proper packaging.

Packaging Innovations

Many companies are trying to be consumer friendly by designing packaging for their product that deliver convenience in handling, transporting and usage. For example, Heinz has designed ketchup bottles that are top-down, which makes pouring the sauce easier. Similarly, the Heinz 'dip & squeeze' packaging makes adding sauce while moving in a vehicle easier.

In Australia, Indonesia and New Zealand, Heinz is launching light-weight cans for beans and soups. In China, Heinz infant food jars come wrapped in paper sleeves which are an environmentally friendly alternative to plastic shrink-wrap.

In the pharmaceutical industry, India-based Bilcare Research offers a complete range of high-quality packaging films that meet complex pharmaceutical specifications. The choice is restricted in blister packaging films which are either very low-moisture barrier films, or expensive high barrier films. Optimum packaging is required as protection against moisture is an important requisite in pharmaceutical products to ensure product stability, efficacy and safety.

Supported by R&D efforts, Bilcare Research has introduced a variety of films including pharma-grade barrier films, cold-forming foil, aluminum lidding foils, and other innovative products to create a brand identity with anti-counterfeiting features. Ultra-high barrier film, eco-friendly halogen-free films, and eco-friendly lidding foils have been created, along with flexible laminates made of paper, aluminum, polymer and film combinations.

In active packaging, a recent introduction to the packing industry, the gases present inside a package are modified by incorporating oxygen scavengers or desiccants into the film to absorb moisture. This technique is used in Japan to protect food against fogging, to prevent fruits and vegetables from ripening, and to inhibit growth of bacteria inside the package.

PET Bottles

For packaging liquids such as aerated drinks, fruit juices, wines, spirits, etc., suitable bottles are required. It was found that PET bottles garner a huge global share of the beverage packaging market. According to Euromonitor sources, most juices and RTD tea come packed in PET containers which it named "the star beverage pack performer." No wonder, as the global off-trade demand for this type of packaging went up 6 percent in 2010.

PET is preferred over metal cans for packaging carbonated soft drinks in many countries such as China, which relies heavily on PET for packaging juices at a market share of 92 percent. With more demand for juices, Euromonitor forecasts double digit annual growth for PET bottles in the period up to 2014.

"Despite the wide appreciation of liquid cartons in China, PET continues to gain a big share in the juice drinks segment through new launches. The entry of wide-neck bottles is apparent in single-serve drinks and adds to the positive outlook for PET," said Euromonitor analysts.

It was announced that global economic recovery will benefit beverage packaging materials industry for 2011 through to 2014. Also emerging markets in Asia-Pacific will show remarkable growth with China and India alone set to garner 18 percent of global gains by 2014.

Foldable Cartons

In the emerging BRIC economies (Brazil, Russia, China and India), an annual growth of eight percent in the folding cartons category is projected up to 2016. Over half of the US$12 million tones of increase in this packaging demand may come from China, says a report.

Folding cartons are required in food packaging with special packaging needed for baked products, dairy, ready meals, frozen food, and dry food. Affluence in many populations has triggered increased purchase of white goods like refrigerators and freezers which has led to a demand for frozen food and folding cartons. Even door delivery of pizzas and other food products require specially designed folded boxes to keep in the heat.

With respect to the packaging industry India, China and Brazil are considered to be the major growth centers owing to favorable economic conditions, dynamic growth of the food processing market and the presence of more multinational food processing companies. In the foreseeable future, larger packaging companies will witness substantial growth and are expected to increase procurement spending. A-P

Thai Election Drama:

The New Face of Yingluck Thaksin

BY VICTOR FIC

Thailand's tourism bureau may boast that the country is the land of smiles, but its often tumultuous politics — spanning coups and corruption — has just as often raised frowns.

After the dramatic July 3rd national election, supporters of Yingluck Shinawatra are beaming.

Her Puea Thai Party claimed a resounding 265 out of 500 seats over the Democratic Partys' 159 and their ousted prime minister Abhisit Vejjajiva. The election galvanized the nation and won much international attention partly because of its soap opera quality. Yingluck is a rookie to politics. She is also the younger sister of Thaksin Shinawtra, the former leader of the Puea Thai Party who was deposed in a military coup in 2006.

What led to Yingluck's victory? To start, her Democratic Party nemesis was weak in the central area that grows rice. Party strategists offered some ideas like a price insurance scheme for rice, but it failed to inspire voters. Also, the Bhum Jai Thai party was broadly aligned with the Democrats. It could not assert itself in the populous northeast. Third, economics was also a factored. Experts recall that the incumbent Democrats last year enjoyed a high growth rate. Vejjajiva mistimed the election, however, calling it when higher prices appeared. In contrast, the Puea Thai policies include a 40 percent-75 percent jump in the minimum wage.

But what about the star, Yingluck? She offered the public populism, an emphasis on national reconciliation. Akin to Corazon Aquino in the Philippines in the mid 1980s, she traded on her prestigious family name. As with the latter, Yingluck and her fans insist that she is a fresh, dynamic and attractive face in a country where many are cynical about politicians.

As she exults, Yingluck must ponder some major problems and will find that winning an election can be simpler than governing. To start, she aims for a coalition of five parties that would hold 299 seats. But the election authorities are examining 190 charges of fraud. If upheld, it would significantly lower the seats she controls or influences. Also, any partnership government incorporating so many parties will be fractious and unstable.

To be sure, some political factors remained consistent in this poll. For instance, Pro-Thaksin parties won in the north and northeast areas that have the most people. However, in Bangkok, which dominates national life to the exclusion of any other town, and in the less dense south, the Democrats prevailed. Therefore, supporters of Yingluck's populism interpret her rise as the voice of the masses lashing out at the pro-Democratic city elites.

Before the election, nay sayers fretted that the anti-Thaksin elements called the "yellow shirts" — in contrast to pro Thaksin "red shirts" — might engage in street violence. Instead, the transition from the Democratic Party to the Peau Thai Party looks smooth as of this writing. But experts caution that trouble might arise because the Yingluck's divisive platform includes promoting national unity through an amnesty for Thaksin. He was convicted of corruption charges and sentenced to two years in jail, which he has not served. In fact, when Thaksin labeled his sibling "my clone," it sluiced the tide of his supporters her way but also also ensured that an tsunami of opponents would engulf her — Thaksin has many enemies.

Dr. Michael Montesano is a visiting research fellow at the Institute of Southeast Asian Studies in Singapore. He asserts that, "the course of democracy in Thailand is interesting. Even during long decades of military domination of politics, Thais came to value elections as the basis for legitimate government. Thaksin succeeded in connecting elections to delivering what voters wanted. Thai democracy is very strong, but so are its enemies. In recent years, the open statements in favor of a profoundly undemocratic order made by the yellow side of Thai politics have been astonishing for the twenty-first century."

What are the economic implications? Before the poll this spring, global investment banks were nervous that Yingluck would prevail and her populism would trigger the conservative military's response. They advised clients to get out of the stock market. It fell by more than US$1.5 billion. But the market surged by just under 5 percent when it concluded that the men in uniform would not react.

As for Yingluck's left wing ideas, e.g. a huge hike in the lowest wage, experts predict this will be financially and bureaucratically arduous. Can she really give iPads to the nation's 8 million students? Can she truly meet her pledge on rice to pay close to twice the present market rates? HSBC, the investment bank, concludes all these policies will "come back to bite" if they decrease Thailand's attractiveness for foreign investors.

A related wrinkle is the clash between fundamentals and growth. It pits the Bank of Thailand against Yingluck. The former planned to increase interest rates from 3 percent to 3.75 percent to contain inflation, an impediment to Yingluck's desire to dole out money. Montesano warns that "Phuea Thai's heavy spending policies risk exacerbating already serious inflation. This could quickly...turn popular sentiment against any government."

On foreign affairs, Montesano predicts that "the end of a Democrat Party government means better relations between Thailand and Cambodia, good for the Association of Southeast Asian Nations. The Abhisit government's let itself be dragged into a crisis with an ASEAN neighbors because of its weak domestic position and resistance to serious multilateral efforts to solve it. Still, the replacement of Abhisit will not bring unity and resolve to ASEAN in areas like the disputes over the South China Sea."

How should Washington respond to Yingluck's rise? "It must accurately grasp," Montesano says, "the deep changes in Thai society during the last fifteen years and end its knee-jerk support for Thai elites whom it assumes are liberal just because their members are well educated and can speak English." A-P

Vietnam's Industrial Growth Gets a New Twist

BY JAI C.S.

Vietnam, the thickly-populated developing country which had been struggling for the past 30 years due to war, loss of financial support, and the centrally-planned economy, is now slowly stabilizing and is proving to be one of the few fast-growing countries in the world.

A number of industrial zones and major economic zones have been established in the country.

Located along the Asia-Pacific Rim in Southeast Asia, Vietnam's industrial production value is said to have gained satisfactory growth with 73.7 trillion dong, rising 16.1 percent against the same period last year, of which, state economic zone saw a growth of 6.7 percent, private economic regions went up by 18.9 percent and foreign invested economic areas soared 18.5 percent, according to the general Statistic Office.

Key industries focused on in Vietnam currently include food processing, garments, shoes, machine-building, mining, coal, steel, cement, chemical fertilizers, glass, tires, oil, and paper.

According to the Economist Intelligence Unit's (EIU) country intelligence data and report, Vietnam's economic outlook forecasts to be strong for the future. In spite of the fact that the entire world is seeing an economic recession, Vietnam is gaining the strength to continue as a highlight in terms of gross domestic product (GDP) growth compared to other economies around the world.

Reports also indicate that with Asia currently being the strongest region in terms of economic growth, foreign investors will remain positive about Vietnam's long-term prospects.

Vietnam's economy is mainly dominated by state-owned enterprises (SOEs) which are reported to produce about 40 percent of the GDP. The country is also planning to implement the structural reforms needed to modernize the economy and to produce more competitive export-driven industries.

Way back in 2007, Vietnam joined the WTO and eventually became an official negotiating partner in the developing Trans-Pacific Partnership trade agreement in 2010. Industrial share increased from 36 percent to 41 percent this year. Over the time, foreign trade and foreign direct investment (FDI) also have improved significantly in this place. From 1990 to 2005, agricultural production nearly doubled, transforming Vietnam from a net food importer to the

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world's second-largest exporter of rice. The 2001 entry-into-force of the Bilateral Trade Agreement (BTA) between the U.S. and Vietnam was a significant milestone for Vietnam's economy and for normalization of U.S.-Vietnam relations. Bilateral trade between the United States and Vietnam has expanded dramatically, rising from US$2.91 billion in 2002 to $17.9 billion in 2010. After China, the U.S. is Vietnam's second-largest trade partner.

Vietnam's industrial production value in January 2011 is reported to have reached VND73.7 trillion (US$3.52 billion), rising 16.1 percent against the same period last year. Some of the products that reported high growth this year includes; rolled steel 15.9 percent, powder milk 15.4 percent, electricity production 14.3 percent, motors 13.5 percent and adult clothing 12.4 percent. Industries like liquefied petroleum gas reported a growth of 36.2 percent, footwear 35.1 percent, ceramic tiles 32.5 percent, tires for automobile and tractor 26.8 percent, glass 20.7 percent, cement 18.9 percent and textile fiber 17.2 percent.

More foreign investment is expected to flow into supporting industries in Vietnam this year, according to the Taiwan External Trade Development Council (TAITRA).

Vietnam this year is also said to be oriented towards infrastructure development and supporting industries.

Meanwhile, the country is planning to invest nearly US$50 billion in the power sector in the next 10 years to propel its economy and plans to issue domestic and international bonds to raise funds for new projects, the Ministry of Industry and Trade said.

The country's fruits and vegetable exports in 2011 are expected to touch some US$500 million, according to Ministry of Industry and Trade. The country's key export products included tropical fruits like dragon fruit, pineapple, mango, avocado, papaya, jackfruit and other canned and processed fruits and vegetables. Vietnam has set up special commodity regions like rice in the Mekong Delta and Red River Delta; coffee in the Central Highland and Southeast region; tea in the mountainous and northern midland; rubber in the Southeast region, Mekong Delta and some northern provinces; vegetable in Lam Dong and provinces in the Red River Delta; sugarcane in the Central coast and so on which has helped in getting a clarity.

Vietnam is currently a net exporter of agricultural products. Other than rice, key exports are coffee, pepper, cashews, tea, rubber, wood products, and fisheries products.

In 2010, Vietnam stood among the top 17 suppliers of food and agricultural products to the United States, which strongly indicates Vietnam's growing importance as a global supplier of key agricultural commodities.

Also, from January 01, 2010, Vietnam took over as the president of the Association of Southeast Asian Nations (ASEAN) which also includes countries like Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore and Thailand. The country aims to utilize its term as the president to accelerate development of the ASEAN Community, strengthen regional solidarity and cooperation, and enhance Vietnam's image at the international front.

Vietnam and India have established very solid legal frameworks. The two countries formed the strategic partnership in 2007. India recognized Vietnam as a country with a full market economy. A series of agreements, particularly the Agreement on ASEAN-India Trade in Goods (AITIG), facilitate Vietnamese competitive goods to deepen the roots in India. The results prove that India is a very potential market for Vietnam in all fields of cooperation, especially trade and investment.

Vietnam's Fishing Industry

Viet Nam has a coastline of 3,260 km and has over 4,000 islands. There are four main fishing areas: Gulf of Tonkin, shared with China; Central Vietnam, the Southern Mainland Shelf; Southeastern Vietnam, the Northern Sunda Shelf and part of the Central Sunda Shelf; and Southwestern Vietnam, part of Gulf of Thailand, shared with Cambodia and Thailand.

The Vietnamese aquaculture followed some of the successful quality management program under developing countries' standard. Export aqua-products of Vietnam were trusted in foreign markets as Japan, EU and the United States. The country's aquaculture industry aims to achieve annual growth of 8-10 percent until 2015, with export revenue estimated to reach US$6.7billion by 2015 and $8billion by 2020. In a conference held recently, the former deputy Minister of Fishery, Nguyen Thi Hong Minh, said that the Viet Nam Fishery Export Development Plan is all set to develop the fishery sector into a large-scale production sector with high global competitiveness. Minh also said that by 2015, fishery materials for processing exports is expected to reach 3.2-3.5 million tones, 2.5-2.6 million tones of which will come from local production and the remaining from imports. In addition, he also said that the industry will also focus on developing the processing industry to raise product value and improve the competitiveness of Vietnamese fishery products. In the coming years, besides seeking new export markets, the industry would maintain the key export markets of the EU, Japan and the US, Minh said.

Vietnam's Forestry

Vietnam is currently facing a rapid growth capacity for wood products manufacturing. The Country is likely to continue its rising status as a wood products exporter. Vietnam's hardwood imports have increased. Forestry in Vietnam is seeing major important changes with the transformation in managing mechanism from state to society; allocating forest and land forest to household management, connecting responsibility of forest resources guards, managers to benefit from forest; encouraging development of bio-diversification and so on. The country is gearing its strength to become a leading furniture manufacturing country in Asia. Vietnam wood serves as a vital platform to address the needs and anticipate the demand of the local furniture industries. Vietnamese wooden products exporters have already signed contracts worth US$3.4 billion recently. China is becoming a big importer of Vietnam's furniture, after the U.S., the EU and Japan which respectively imported US$889 million, $387 million and $271 million in Jan.-Aug, 2010. Preliminary statistics from the Vietnam Industry and Information Center shows a 38.4 percent year-on-year increase in Vietnam's wooden product exports.

Agricultural Industry

Vietnam's agricultural sector is better positioned than any other industry after 1988 when collective farming was effectively abolished and prices began to stabilize. Year 2000 marked a remarkable growth in creating favorable environment and conditions for companies. After enforcing the Enterprise Law, Vietnam issued many important legal documents such as Decree on business registration, guide to some articles of the Enterprise Law or Decision to remove 145 kinds of licenses, limiting business performance. The Land Code was adjusted in 2001. Trading rice and fertilizer was liberalized with participant of all economic sectors. Enterprise reform was promoted. Agriculture has demonstrated a remarkable response to the economic reforms introduced from the 1980s onwards. Not only has agriculture grown rapidly, it has also underpinned the success of the rest of the economy.

Mining and Minerals

Vietnam's mining industry is also presenting evidence of considerable growth potential. The mining industry plays a very important role in Vietnam's economy, as mineral trade accounts for a large share of the country's overall trade. Vietnam now is taking advantage of some 38 kinds of minerals which are used for production of more than 54 commodities. Value gathered from minerals and products manufacturing from minerals, as indicated, reached about US$25 billion in 2010. Iron, titanium and copper were the leading metals exported. Other minerals include tin, wolfram, gold, lead, zinc, uranium, antimony, rare earths, gem, limestone and clay. Some minerals with large potential and high economic value are being exploited for socio - economic development of the country. Some large-scale mining projects are being implemented such as Lam Dong

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Expert David Russell:

Tsunami Washed Japan's Spirit Out to Sea

BY VICTOR FIC

Japanese people normally welcome spring as the season when pink and white cherry blossoms perfume the air and float on warm breezes.

But on March 3rd, a gigantic earthquake and tsunami devastated the nuclear complex at Fukushima 206 km north of Tokyo and the surrounding area. Now the country is contemplating not wind borne flower petals, but radiation seeping into cattle, crops — and people.

Just how much damage was inflicted on Japan's economy? American David Russell offers his insights. Armed with a masters degree from Columbia University, he has lived in Japan for 25 years. Russell has worked for a Japanese securities company, then the leading business newspaper — the Nikkei — and later started his consulting firm with clients such as Toshiba, Bridgestone and Dentsu. He is an award-winning author of several business books and a landmark article in the Harvard Business Review.

In this exclusive, we asked Russell, "Assess the impact of 3.11 for Japan's economy."

He starts that "Japan's two lost decades since 1990 saw minimal or negative economic growth, rising unemployment, rudderless politics and a steady decline in its global power and prestige." The disasters are a "body blow to an already weak economy. How it affects the psyche of Japanese consumers remains the biggest risk factor for future stability."

The government first tabulated the cost of rebuilding at 6 trillion yen ($US 70 billion), then augmented it by 13 trillion yen more (US$165 billion). But one factor omitted, observes Russell, is "how much the the radioactive fallout, real and imagined, will taint agricultural produce from Japan's northernmost prefectures."

For instance, the endangered Tohoku area is poor, but housewives buy its delicious koshihikari, sasanishiki, and akitakomachi varieties of rice. "This fall," predicts Russell, "they will likely reject these." What if officials certify quality? The bags will sit on the shelves because Japanese housewives really buy on reputation. "The government's credibility was among the largest victims of the disaster. It won't recover as quickly as the crops," notes Russell. Japanese housewives now deem everything that grows north of Tokyo as suspect." All Japanese learn that radiation killed thousands for years after Hiroshima. Russell predicts that Tokyo "must purchase the entire fall rice crop. It extends decades of massive farm subsidies," but still means a huge extra expenditure.

The beef industry is also at risk. After 3.11, about 1,500 cows became toxic from ingesting radioactive hay, with the meat shipped nation wide and much of it consumed. Radiation was also detected in plums, bamboo shots, milk and other products — reinforcing the anxiety.

What about tea? "Japan's best comes from Shizuoka Prefecture, but it also contains radioactivity — people are spurning it. See an ugly picture forming? Many producers will go bankrupt. Or Tokyo must also subsidize the beef, tea, vegetable and fruit growers — same for fish. See an ugly picture forming? So the real fallout is spreading fear. New bond issues and tax increases cannot cover that. Imports will rise."

Radiation was also detected in milk, bamboo shoots, mushrooms and plums.

What about exporting these goods? Russell explains that foreigners will bristle: "Why aren't Japanese eating it?"

What about government reform? Russell insists that "The 3.11 mess is a golden chance to re-think the status quo and revitalize the economy from the bottom up." He praises the efforts of the American-born entrepreneur William Saito. As an opinion leader, Saito is rising fast as one of the 80 people included in McKinsey's recent "Re-imagining Japan" essay collection. He was also named to participate in "Young Global Leader," an international organization similar to the World Economic Forum.

Russell hails Saito as a role model for the new Japan. "Immediately after the disaster, Saito visited key ministries to snap them out of their paralysis and urge quick, strategic action to facilitate aid." For instance, he was "instrumental in arranging special visas for foreign doctors. Remember that foreign medical staff were refused entry after the 1995 Kobe earthquake because they lacked licenses for Japan. He also ensured that medical supplies donated by global companies passed customs quickly for distribution. Those would normally be banned because their labels are not in Japanese and their efficacy untested here."

Russell observes a hopeful sign that Japanese commentators are praising Saito for achieving considerable bureaucratic reform where decades of deregulation talk has failed. In a private conversation with Russell, Saito offered that, "People say...that the bureaucrats are too set in their ways. That's not true. [They] make rapid and significant changes when the fate of the nation is in their hands. ... A few changes could release some of Japan's enormous untapped energy."

But the momentum toward structural change could peter out. "As 3.11 recedes," says Russell, "optimism for reform also dims. The potential exists. But the central bureaucrats and Japan, Inc.'s leaders seem determined to vindicate the cynics because they don't sense a crisis. Their inability to grasp the current situation

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Beaches Worth Visiting in Korea

JIN-SUK YANG

Korea, surrounded by the ocean on three sides, offers a great variety of beaches.

If travelers are to spend their summer vacation in Korea it is an absolute must that they visit one of its beaches. Due to the fact that temperatures rise to 30 degrees Celsius or more during the months of June, July, and August, most beaches around the nation open in early July and close towards the end of August. Yet despite summer being an ideal season to visit, tourists could still enjoy festivals, water sports and sunrises at beaches all year around.

East Side

The East Side has a simple coastline, clear waters and expansive beaches with white sands. The sunrise over the East Sea is well known for its spectacular beauty, and most beaches in the area hold a Haemaji (sunrise greeting) festival every year. The sunrise festival takes place on New Year's Day, but the sun slowly emerging over the ocean horizon is a sight to see throughout the year.

Sokcho Beach, which is famous for its expansive white sands and clear waters, is also well known for its spectacular views against the backdrop of pine groves. There are many tourist sites nearby including Mt. Seoraksan, which give tourists the chance to easily visit other places as well. This is a great vacation site as it has various visitor facilities (parking lots, campsites, etc.) as well as lodging. In addition to swimming in the ocean, tourists can enjoy ocean fishing in Jodo Island. Next to a breakwater is a fisheries market where tourists can indulge themselves in fresh raw fish, but the biggest benefit Sokcho Beach has to offer is its convenient transportation. It is close to the Express Bus Terminal (about 500 meters) and it is so easy to find that even foreigners unfamiliar with the area will have no problem sighting it.

Gyeongpodae Beach is the largest beach on the east coast and is about a kilometer away from Gyeongpodae, which is a famous site for viewing the sunrise and moonrise. The greatest pride of Gyeongpodae Beach is the coast, which is covered with fine, clean sand. The sand quality is quite nice, making it the perfect spot to enjoy a hot sand bath or a walk, barefooted. Another of Gyeongpodae Beach's assets is that there are a wide variety of things to enjoy in addition to swimming. Tourists can tour Gyeongpodae Beach in the Gyeongpo tourism carriage and enjoy recreational sports including banana boating, jet skiing and water skiing (When the beach is open from early July to the end of August from sunrise to sunset.). Every year, at the end of July, a Summer Beach Art Festival is held. Many cultural events such as folk performances and the Ocean Art Festival lure the people's attention.

Naksan Beach is a famous site on the east coast along with Gyeongpo Beach. The beach boasts clear waters, thick pine groves and various facilities including lodging complexes and convenience stores. The quality of the sand is also good, making it a great beach to visit. Naksan Beach is also popular since it's located close to Mt. Seoraksan, a national park; Uisangdae Pavilion, where the view of the sunrise is breathtaking; and Naksansa Temple, where the huge white statue of Gwaneum is situated. There is a wide array of seaside events in the summertime, but the largest event of all is the sunrise celebration on January 1.

Guryongpo Beach's name comes from the myth of nine dragons that appeared from the ocean and flew up into the sky. The beach is characterized by its crescent-shaped coastline and charming pine groves behind the beach. Although the beach is not especially large, the view of the coast is beautiful and there are many facilities for visitors, which gets very crowded during the holiday season. This area is especially popular among those who want to enjoy swimming and fishing since the waters are clear, and people can enjoy fishing off the rocks along the seashore as well.

West Side

Most of the beaches on the West Side offer convenient transportation. When leaving from Seoul, tourists can enjoy a day trip, making the West Side an extremely popular place among travelers who don't have much time on their hands. In addition, most of the beaches on the West Side have foreshores, allowing tourists to enjoy the ecological marine life, and appreciate the beautiful sunsets

Eurwangni Beach is lined with pine trees and has beautiful rocks and stones on either side of its white sands. It is a popular day trip destination because of its close proximity to Seoul and to Incheon International Airport. The water is quite shallow, so even children can enjoy swimming in the sea, and there are various unique lodging facilities available. Tourists can also rent a boat and sail out on the water or fish from the rocks along the edge of the seashore. However, the beach has many shells in the white sand, which means it's not an ideal place to walk around barefoot. At Eurwangni Beach, there is an annual sea festival every August that allows people to enjoy swimming in the sea and wrestling on the beach.

Daecheon Beach, which is the biggest beach on the west coast, is known for its shallow waters and calm waves, making it the perfect place for a family getaway, since even children and seniors can enjoy a day at the beach. The sand at Daecheon Beach is especially soft because it is composed of shells that were eroded into sand over time, and the sand washes off easily.

The upper portion of the beach has fine, soft sand while the lower portion of the beach is composed of firmly packed sand, allowing tourists to enjoy both a stroll along the beach or a sand bath. As the biggest beach on the west coast, it offers various visitor facilities, as well as a park, and holds various events such as the Daecheon Beach Festival and a yacht race. There is a mudpack house located on the far west side of Daecheon Beach where tourists can enjoy Boryeong mud, which is famous around the world.

Muchangpo Beach, which was the first to be opened on the west coast, is where tourists can enjoy a special experience referred to as the "Miracle of Moses." The sea parts twice a month (around the midpoint and last day of the lunar month) on Seokdaedo Island. Tourists can catch seafood such as turban snails and octopus while walking along the dry path in the middle of the sea. Tourists can also watch traditional fishing on the foreshore, where people use the rock piles for catching fish. Muchangpo Beach, which offers many exciting and enjoyable activities, has shallow waters and the water temperature is just right, making the beach a great place to go swimming. The glow of the setting sun at Muchangpo is known as one of the eight spectacular sights of Boryeong-si. The sight from the breakwater is especially beautiful.

Byeonsan Beach, which is one of the three main beaches on the west coast along with Daecheon and Mallipo Beach, is a beautiful gem that is part of Byeonsanbando National Park. Byeonsan Beach has a long stretch of fine sand, and the average depth of the water is only one meter. The beach is a perfect place to take a dip in the sea since the waters are calm and warm. One of the most notable characteristics of Byeonsan Beach is that it offers breathtaking scenery. The white sands and green pine groves are especially picturesque. It is lacking in only one regard: despite the fact that the beach was opened in the 1930s and has been around for a long time, there is not much lodging or tourist facilities nearby. However, there are mountains and other beaches nearby, so tourists can easily find a place to stay not too far away.

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South Side

There are a countless number of islands in the South Side. Each beach has a different atmosphere according to the characteristics of the island on which it is found. It is where Jeju Island, a favorite tourist site in Korea, is located, enabling travelers to enjoy a beautiful sight of the ocean that differs from the landscape on the eastern or western coast.

Jungmun Beach, which is located right next to the Jungmun Tourist Complex, has a uniquely elongated sandy plain. Towering over the black, white, red and gray sand called jinmosal and the white sandy beach, which is curved like a bow, are the stunning black rocks of Jeju Island. Thanks to its breathtaking scenery, it is a popular place for filming movies, television dramas and commercials, and also as a romantic destination. To the right of the beach, tourists can see a natural cave and a cliff, which is covered with various rare plants, enabling them to observe the local ecosystem. The current is swift, making it a good place to enjoy water sports such as jet skiing and windsurfing. During the summer season, a Beach Film Festival and a Summer Festival is held.

Hyeopjae Beach is a great place for novice swimmers because the waters are shallow and the coast is very gently sloped. The silver-colored sands are filled with shells and the emerald ocean waters are so clear that the ground can be seen from above water like a watercolor painting. The sight is all the more beautiful because of the black basalt on one side of the sandy plain, and the view of Biyangdo Island from the ocean. The sand is relatively firm, making it just right for a stroll. Tourists can also set up a tent and enjoy camping in the forest grove behind the beach.

Haeundae Beach, which is one of eight popular spots in Korea, also remains the country's premier beach. Its waters are shallow and there is almost no change in the tide. In the summertime, this place gets so crowded with many vacationers that there is almost no room to stretch out, and it is very popular among foreigners. The white sands of Haeundae Beach are rough, which makes it easy to brush off of one's body. The beach is also famous for the sunrise over the horizon and the sight of the moonrise from Haewoljeong Pavilion. Haeundae's Dalmaji Road, which is located between Haeundae Beach and Songjeong Beach, is a great spot from which to enjoy an elegant view of the moon. There are many hot springs nearby, enabling visitors to ease away their fatigue after swimming in the ocean.

Sangju Beach, the biggest beach on the southern coast, has all the ideal features: good sand, clear waters and beautiful groves. Fascinating rocks and stones add to the beautiful landscape, and the beach is cozy since it is sheltered by Mt. Geumsan. Visitors can enjoy both mountain hiking and swimming in the ocean. The silver-colored sand on the beach is exceptionally soft, making it a pleasant place for a barefoot stroll. The thick pine groves that surround the white sand are also the pride of Sangju Beach. The beach has many tourist facilities including a shopping center and lodging, and on one side of the sandy beach is a campsite that is popular among youths.

Korea's beaches offer visitors a chance to cool off, have fun in the water, and enjoy some beautiful scenery. Korea is surrounded by water and so there are plenty of good beaches to choose from. Visitors to the west coast can watch the sunset over the vast tidal flats, while on the east coast you can soak up the sun on dazzling white beaches. Jeju Island's beaches even offer you a taste of tropical paradise. A-P

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bauxite mining, Co Dinh chromites mining and Thach Khe iron mining.

Problems Faced

However, many problems still exist related to the effectiveness of economic development, the competitiveness of companies, environmental protection, employment and post-industrialization problems. The Vietnamese agriculture, forestry and seafood sectors are expected to face a number of difficulties in the next two years as the country goes through a process of serious economic restructuring, including rising inflation and costs, tightened monetary and credit policies, instability in the international agricultural market, climate change, and disease epidemics. A-P

Shout to Korea, Action!

BY SUN BANG

Besides Korea's well known cell phone, semi-conductor and shipbuilding industries, Korean film has also become globally renowned.

The industry went through rapid growth in various areas over the last decade and achieved significant developments in its quantity.

The creative stories and dynamic images featured in Korean films have gained the world's attention. Several films were shown to wide acclaim in major film festivals across the globe catching the eyes of both film professionals and the world audience. Therefore, Korea is becoming the first country film professionals look to when searching for new talent.

Korean film financing largely depends on equity financing. Equity financing does not guarantee a payment on the principal, but it is similar to an interest paying method with profits made according to the size of the investment. The main investor who owns the copyright is in charge of raising such funds. Equity financing for Korean films can be generally divided into three categories - the main investor, sub-investor and the production company which raises funds on its own. The main investor, investment companies which own the distribution rights, uses the money raised by the production company and the money borrowed from the sub-investor for the production costs and then secures the copyright. It also manages the production, ensures the completion of the film, calculates the profit and costs and licenses the rights. The sub-investor supplies a portion of the costs used for production to the main investor and is entitled to receive a fixed percentage of the profits made from licensing sales in accordance with its equity share.

Investment Structure

Korean filmmakers have earned a global reputation for their hard work and innovation. From world renowned directors to skilled crews and experts in post production, as Korea has one of the most competitive workforces in the global film industry. It has therefore become the most sought-after location in Asia when it comes to international productions.

Award-winning Writers, Directors, and Producers

Korean directors and producers have become highly recognized in the international film community. From director Kim Ki-duk's Spring, Summer, Fall and Winter to Park Chan-wook's Old Boy and Lee Chang-dong's Poetry, Korean films have swept up numerous awards at Cannes and other prestigious film festivals.

Talented Actors and Actresses

For the last decade Korean actors and actresses have been at the center of Hallyu, or the Korean Wave, and have become loved by audiences from all over Asia. As the leading figures in the Asian entertainment industry, their acting talents have been highly recognized and have drawn tremendous attention from film professionals in the region. Recently their presence have become internationally apparent with Jeon Do-yeon receiving the best actress award at Cannes for her performance in Secret Sunshine and other colleague actors such as Lee Byung-hun, Rain and Jang Dong-gun taking main roles in Hollywood productions G.I. Joe, Ninja Assassin, and The Warrior's Way.

Innovative and Flexible Crews

The strong work ethic and passion of Korean film crews stands unrivalled. From scripting to location scouting, DOPs, costume designers, stunt people and lighting technicians, Korea boasts professional and committed specialists with international experience in almost any area. Skilled experts in post production As Korea is well known for its excellence in the IT industry, so are the people in the film post production process. From film laboratories to digital and VFX production, the post production workers complete their work quickly, with quality assurance and cost-effectiveness regardless of the scale of the film all in conjunction with cutting-edge facilities.

Korea has dedicated film sets and studios in a wide range of sizes as well as full post-production laboratories, sound and digital imagery facilities. Backed by government support programs and private investments, Korea offers many competitive advantages to ensure cost-effective production of your film.

Outdoor Film Sets

There are 28 main open sets currently being used for film or TV drama productions in Korea. Most of them are located out of the Seoul Metropolitan Area, with Jeolla Province which has the largest number of 11 sets, followed by Chungbuk and Gyeongbuk Province with 8 together. Most of the sets were heavily invested in by local governments and TV stations. They are mostly used for shooting period pieces that cover ancient through to modern times yet some of them are equipped with special contemporary sets such as prisons and churches.

Studios (Sound Stages)

Among the many film studios in Korea, 4 major film studios are the most frequently used. Rental fees per day vary depending on the sizes and equipment available in each studio ranging from US$300-$1,000. Diverse support services are also available including production offices, ancillary buildings, amenity facilities, storage, etc.

Post-production

Korea is fast becoming a favorable one-stop location for the entire post production process. From traditional film laboratories to sound and digital post production, Korea offers highly advanced facilities fully equipped with state-of-the-art technology.

Visual Effects

Korea boasts world class visual effects services that have built an international reputation for many years now. Filmmakers can expect highly efficient services both with the security of large-scale facilities and the flexibility of smaller independents. As seen in many co-productions across Asia and internationally acclaimed local productions, the nature of adaptability and the meticulousness of the Korean industry is highly sought after when it comes to the visual effects field.

Korea's Cooperative Law

There are 4 ways that foreign film producers may shoot films in Korea by means of a liaison office or branch office in Korea, jointly producing with a production company in Korea, or just receiving production services.

1. Establishment of Liaison Office

The establishment of a liaison office means that a foreign company who wants to shoot a film in Korea is registered in Korea as a foreign company and serves as its legal representative. Although the liaison office is located in Korea, on practical and legal terms it belongs to the overseas parent company and all responsibilities and liabilities of the liaison office are attributed to the overseas parent company. Thus, the Liaison Office is not allowed to undertake any commercial activity such as business contract transaction independently. Only the parent company which established the liaison office can conduct accounting transaction and business contracts. Establishing a liaison office does not particularly require capital and the registration process is simple. Also, the liaison office is suitable for limited researching and collecting market information, and acting as a communication channel. The legal representative of liaison office may hire an employee for its operations or directly operate the liaison office. If the legal representative is not of Korean nationality, he or she should obtain a visa prior to entry into Korea.

Procedure for the establishment

1. Report on the establishment of the liaison office to a designated Foreign Exchange Bank
2. Obtain business identification number from the competent tax office
3. Open bank account at the designated Foreign Exchange Bank (remittances shall be made through this bank account between the parent company and the liaison office)
4. Normal processing time required for the establishment: 3~4 days

2. Establishment of Corporation in Korea

A foreigner or foreign corporation may establish a corporation in Korea. A corporation, established independently and newly in accordance with Korean laws, is an affiliated company of the overseas parent company which holds ownership as a majority stockholder and carrying legal binding force on its business activities. A corporation is a completely separate entity from the parent company in the legal and accounting aspects.

Therefore, the corporation should observe the Korean laws and regulations including Labor laws, Corporation laws, Accounting laws, Tax laws and other relevant laws and regulations governing its business activities in Korea. Beside corporation, one may set up a limited liability company in Korea which can limit the liabilities of the owner, so it is obliged that appropriate consultation shall be asked prior to the establishment.

Procedure for the establishment

1. Report the corporation as a foreign invested company to a designated Foreign Exchange Bank
2. Register the establishment of the corporation with the competent tax office
3. Register the establishment of the corporation with the District Court

3. Co-production with Korean Production Company

There are various forms of co-productions with production companies in Korea and different approaches are possible depending on the terms of the contract. The Korean production partner can take on all the responsibilities for investments in Korea, due formalities, contracts as well as effective and efficient management of the production. In addition, if specific conditions are met, various financial benefits are given through the support programs offered by the Korean Film Council and regional film commissions.

At present, Korea has concluded a co-production treaty with France and New Zealand.

4. Cases Involving Receipt of Production Services Only

In cases where the foreign producer only receives production services, he or she may contact the film producer or production service company or freelance producer in Korea. Once the partners have been arranged through these institutions, the foreign producer may receive all the services related to production support programs including film crew, actors, extras, location, equipment and technical companies and other matters associated with the production. The fee for the production services is estimated at 15 percent of the total production budget to be spent in Korea as a general rule and it is subject to change. A-P

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— not the nuclear problem but the Japan problem — is the real issue."

If money talks, then the foreign stuff is negative. Russell reveals that, "New York-based fund managers tell me that that investors are withdrawing from Japanese equities in droves because 'this economy has no future. The Japanese have the brains, the technology and the capital to be first-class, but its all going down the toilet."

In fact, the small minority of Japanese executives facing the global challenge of 21st century business would concur, finds Russell. "For instance, Tadashi Yanai, CEO of Fast Retailing Corp., the country's shining star of global sales growth, wrote recently in McKinsey Quarterly that 'Japan's biggest problems are conservatism and cowardice.'" Even as a few men who understand the malaise assert this, laments Russell, "the ruling cliques reassure each other there is really no crisis. Patching up, perhaps another new captain on the bridge, and some new taxes to cover reconstruction costs are enough."

He rues that "those of us who have made Japan our home must look for a lifeboat or go down with the ship. Yes, Japan is sinking into its third decade of losses to industry, but even worse, whole generations of Japanese have been lost. They have faced conservatism and gloom. Their school aspirations are myopic. Their willingness to develop that digital widget application they sketched out in university is close to zero. Far more important is this crippled social sphere that encourages future business success. For the first time in generations, Japanese expect their quality of life to be lower than their parents'. The vision and guts that made Japan successful is disappearing, as if dragged out to sea with the receding tsunami. A-P

The Hardest Part Was My Visibility:

Kim Ha-Neul

BY SUN BANG

Blind comes at a time when the genre exploration which has taken place in the Korean film industry in the last few years has led to demands that moviemakers reach deeper and further for their subject matter.

Selected as the Most Popular Project in the 2009 Hit By Pitch held by the Producers Guild of Korea and regarded as one of the hottest projects on Chungmuro, Blind is worthy of attention as it represents a novel approach to the thriller genre.

In the film, as cases of missing female college students continue to pile in, a woman reports witnessing a hit-and-run. The witness turns out to be a visually impaired woman played by Kim Ha-Neul, whose testimony the police is reluctant to believe at first, but eventually trusts as the woman displays her acute senses other than her sight. Then one day a second witness, played by Yoo Seung-Ho, comes on the scene, but he is unable to corroborate the woman's testimony. As the case develops, they find that the victim of the hit-and-run case is one of the missing college girls and the puzzling chase of the serial killer begins. Who is telling the truth?

Blind is reminiscent of the classic thriller Wait Until Dark (1967) in which Audrey Hepburn played a blind woman. In Blind, creating the suspense hangs on amplifying the tension in situations where sight cannot play any role. The woman drills to the core of the case just by sensing the sounds and their directions, smelling the scents, and remembering the feeling of the wisp of wind that brushed her ears when the window opened. Kim Ha-Neul, who has been expanding her scope by appearing in comedy, romance, and even horror films, is quite believable as a blind person. The combination of Kim Ha-Neul and Yoo Seung-Ho, who is one of Chungmuro's rising stars, comes from an accurate assessment of the demands of Korean popular culture.

Kim, heroine of the movie, did her best in filming despite the possibility of losing her eyesight from an accident which happened on the set. Kim plays a blind person as her first attempt in her acting career in Blind. Throughout the Mega Box press interview, she talked about truth and artifice in her acting.

How did you arrive at this approach for telling Sua's story?

Kim: I met and studied blind people and their lives a month before the shooting for her character in the film. I went through a lot of things while shooting this project. I studied Audrey Hepburn's Wait Until Dark and Al Pacino's Scent Of A Woman. I also suffered from panic disorder and got injured by losing her eyesight for a moment while shooting. But, I felt great because these things mean that I really concentrated on my character.

How has the long process of creating Sua character deepened your acting career?

Kim: Sua has her own trauma and overcomes at the end. She grows up by unexpected happenings. What I liked about playing Sua character was that I could feel and deliver the complex feelings. During the shooting, I doubted if I could express her feeling and emotional burdens. I ended up with the doubt, but that's still very special to me comparing my previous acting experience.

Any special preparation for the role?

Kim: I spent a quiet long period of time with the blind, to act, not to pretend. During the time with them, I tried to research

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Information Technology in Healthcare

BY SHAMILA JANAKIRAMAN

Information Technology has revolutionized healthcare delivery in several countries across the globe.

It helps in the management of information as computers simplify the work of personal health information management for both doctors and patients. It also increases the avenues of communication between healthcare providers and consumers.

Computers and other electronic devices simplify the storage, sharing, and access of health information for healthcare providers in hospitals, labs, X-ray facilities and so on. The usage of computers for this application is called Health Information Technology (HIT) or Health IT.

HIT reduces paperwork, as handwritten medical records become a thing of the past. It reduces medical errors by transmitting accurate information electronically which eliminates the chances of miscommunication due to, for instance, a doctor's bad handwriting.

Healthcare costs significantly decrease because doctors do not have to repeat medical tests if a patient changes from one to another. It also eliminates the storage space and staff time needed to maintain medical records. All such factors help in enhancing the quality of healthcare, as medical errors are reduced and accurate and timely information is provided to healthcare providers.

HIT

The important types of HIT used in the healthcare system are personal health records (PHRs), electronic health records (EHRs), and electronic prescriptions (e-Rx).

A personal health record (PHR) is an online document that portrays a person's health and that of his family members which can be used for up-to-date references. The PHR includes everything related to patient health like children's immunizations, the last physical exam, major illnesses and operations, allergies, and a list of family medicines.

An electronic medical record (EMR) is a computer-based document which is similar to a paper medical chart showing health information from the doctor and healthcare providers. The information encompasses a person's health conditions, allergies, treatments, tests, and medications.

PHR and EMR adoption has been advocated by several healthcare and insurance providers. PHR platforms like Google Health and Microsoft HealthVault allow members to access and store personal health information online.

EMRs can be shared between the doctor, other specialists, labs, and imaging facilities that provide X-rays, CT Scans, and MRIs. This helps in collaboration between healthcare providers to arrive at the appropriate treatment method and medicine. This improves medical care delivery as it also includes alerts for drug allergies and other associated problems.

Electronic prescriptions or e-prescriptions (eRx) allows electronic prescriptions to be electronically sent to the pharmacy thereby avoiding human errors in reading a doctor's writing. Electronic prescriptions help avoid harmful drug interactions as doctors will already know the medications that are being taken.

Also popular are CPOE, a medication ordering and fulfillment system, and clinical decision support systems (CDSSs), which both provide physicians and nurses with real-time diagnostic and treatment recommendations. Picture archiving and communications systems (PACS) capture and integrate diagnostic and radiological images from various devices like X-rays, MRIs, CT scans, etc. in a centralized medical record.

HIT in India

Integrating IT into the healthcare system in India was a daunting task but has been successfully implemented in most cases. Healthcare is now considered a multi-disciplinary system which encompasses IT.

"Whether it be in the field of diagnosis, investigations, treatment, documentation, retrieval of information, access to state-of-the-art knowledge, medical instrumentation, teaching, research, etc., IT has made a major difference," emphasized Krishna Ganapathy, co-founder of the Telemedicine Society of India.

IT improves patient care as it enables processes and systems to be introduced and repeatedly monitored via standard operating procedures and audit processes. IT provides real-time and relevant information to both patients and doctors, thereby enhancing the standards of healthcare. Also the increase in computing power results in an exponential reduction in costs. The healthcare IT market in India has grown 200 - 300 percent in the last 10 years.

India is striving to achieve the target "e-health for all by 2020," which is a realistic goal given the technological advancements in the country. The growth in mobile telephony and ICT in India will result in several short-term and long-term benefits considering HIT. For example, a patient's hospital stay can be reduced by up to 39 percent with the improved use of IT.

The Indian government and some state governments are leveraging Telemedicine to provide healthcare to far-flung areas. The formation of the Telemedicine Society of India, the Medical Informatics Society of India, and the launch of e-Health journals are fast promoting the use of HIT wherever possible.

The Government of India has launched the Health Management Information System (HMIS) portal which helps collect local health data and converts it into real-time information such as management indicators and trends that can be graphically represented for better understanding in reports.

In India, HIT implementation is backed by GE Healthcare, Intel, Hewlett-Packard, Cisco Systems, Qualcomm, Microsoft, Google, IBM, Computer Sciences Corporation (CSC), Perot Systems, TCS, HCL Satyam, and many others.

Already Teleradiology is making a great impact while still in its infancy. It enhances radio diagnosis by using optimized communications channels and advanced image acquisition techniques. Teleradiology involves the transmission of digital images acquired through CT scans, digital X-rays, MRIs, etc., to the radiologist through a secure encrypted system.

Sankara Nethralaya, a well-known eye hospital, has revolutionized eye care by implementing new technology in every way possible. All patient records are available online on a secure system which can be accessed from any of the hospital's centers. Arvind Eye Care uses teleopthalmology to talk to patients in remote areas to discuss cases.

PHR and EMR adoption has been advocated by several healthcare and insurance providers. PHR platforms like Google Health and Microsoft HealthVault allow members to access and store personal health information online. Microsoft is striving to promote several of its healthcare offerings in the country.

Standardization of data and processes across hospitals is important in order to enforce the use of PHR, EMR, and so on. A Hospital Information Management System (HIMS) enables seamless interconnectivity between the various departments of the hospital, thereby reducing the use of paper. Although such initiatives are becoming prevalent in larger cities in India, it is already taking root in smaller cities as well.

Mobile health (mHealth) initiatives are being launched in earnest by many companies. Apollo Telemedicine Networking Foundation has started pilot studies in collaboration with Ericson in Tamil Nadu, Bhutan, and Bangladesh. There is a need to reach good medical facilities to remote villages for which Hospitals on Wheels have been introduced with emergency and basic medical facilities.

In order to take IT to the core of the medical profession it is necessary to update the medical curriculum with IT studies included in it. Also, IT in Healthcare should be taught to IT students. Virtual skills laboratories which showcase simulated surgical procedures on virtual patients are also required.

Apollo Hospitals in India has leveraged the services of Tata Consultancy Services to give its patients a Universal Hospital Identification Number (UHIN). Using this number the medical records of the patient can be accessed from any location. HealthHiway, an Apollo Hospitals and industry initiative, provides a comprehensive National Health Data Network to enhance day-to-day processes in a healthcare system encompassing patient services, clinical outcome and financial health of user companies.

Using the network the healthcare community can interact and share data efficiently and securely. The HealthHiway initiative includes revenue management, learning management, performance management, decision support and knowledge management, and clinical information systems.

Factoids

- India is striving to achieve a target "e-health for all by 2020" which is a realistic goal given the technological advancement in the country.
- Korea looks forward to implementing its U-health program fully by 2015.

HIT in South Korea

In order to reduce operational expenses, improve services delivery, and to implement easy medical bill reimbursement, several South Korean hospitals have adopted HIT. The market in Korea was valued at US$92.8 million in 2009 which is expected to grow at a CAGR of 6.8 percent up to 2016.

Frost & Sullivan Research Analyst Amritpall Singh stated, "A major contributing factor to the high growth rate of the healthcare IT market in South Korea is government encouragement through disbursement of subsidies and creation of several policies, guidelines, and regulations."

Developments in e-health in South Korea can be attributed to the advanced IT infrastructure present there. The country is evolving from telemedicine to ubiquitous healthcare (U-health) which involves self-care by patients supported by real-time monitoring by physicians.

Also Korea is growing as a favored medical tourism destination owing to the availability of specialists, modern facilities, and sophisticated equipment. These hospitals invest in healthcare IT, insurance reimbursement, and in electronic health record (EHR) applications.

In U-health, blood sugar content, blood pressure and body weight are monitored and recorded as a daily routine away from the hospital. Doctors can still perform real time monitoring of their patients, keep tabs of any diseases appearing, and prevent them. This helps Korean hospitals to avoid space and facilities shortages at the hospitals and lets them focus instead on treating patients with chronic illnesses.

Remote patient monitoring or RPM systems forming part of U-health in Korea allow patients to go about their daily routine while data on their health is being sent to physicians who keep track of their health. RPM is expected to reduce healthcare spent by US$197 billion over the next 25 years.

HIT helps countries like South Korea invest in infrastructure expansion. This eliminates the need to, for example, build huge hospitals with more beds. Hospitals in the country are encouraged to implement EMR systems.

Private initiatives are also encouraging. General Electric announced a US$6 million plan for five years to build the IT-based U-health research and development center in South Korea's Incheon free economic zone.

Such a huge initiative faces difficulties in a shortage of IT professionals as more students opt for business and management studies. The government has reacted by engaging IT professionals from other countries and by launching IT-related courses through the Korea Advanced Institute of Science and Technology.

Since hospitals may not be able to integrate the new IT-based systems by themselves, it is imperative for the government to help hospitals incorporate new technologies and applications for healthcare professionals to follow. Korea looks forward to fully implementing its U-health program by 2015. However, the fact remains that 90 percent of the nation's healthcare budget covers only 30 percent of the population.

A proactive HIT model offers more business opportunities for companies involved in medical devices, medical insurance and pharmaceutical drug manufacturing. IT enables a connected health information platform to deploy mobile healthcare services.

IT enables patient-centric preventive care, which is the need of the hour, as disease treatment is going to become more complicated with growing populations. Also by 2050, 21 percent of the global population will be comprised of senior citizens, further straining the system. "So for long-term benefits, it is necessary to adopt preventive healthcare measures rather than focus just on disease treatment," said Reenita Das, senior vice president of healthcare practice at Frost & Sullivan Asia-Pacific.

Telehealth enables instant recording of a patient's data irrespective of the location. It allows healthcare providers to perform medical diagnoses from afar, saving time and cost and enhancing the productivity of physicians.

Recently-launched applications for smartphones also bring HIT within anyone's reach and help to avoid congestion in hospitals. A-P

FURTHER READING:

- **Indian HIT Scenario**
  www.kganapathy.com

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Report on India's Pharmaceutical Industry

BY ANSHU SHRIVASTAVA

The Indian pharmaceutical industry in recent years has grown in stature from an industry that copies patent drugs and manufactures them cheaply.

It's now counted among the industries that are fueling India's economic growth and holds vast potential. India-based pharmaceutical companies are also predicted to gain considerable market share in the world by the end of this decade. The industry is estimated to have generated revenue worth US$13.1 billion in FY 2011, according to a new Research and Market's report, "Indian Pharma Sector Forecast 2014."

India-based companies fulfill around 70 percent of the country's demand for bulk drugs, drug intermediates, pharmaceutical formulations, chemicals, tablets, capsules, orals and injectibles. Development economist, Richard Gerster, said that the Indian pharmaceutical industry is a "success story providing employment for millions and ensuring that essential drugs at affordable prices are available to the vast population of this sub-continent."

For the country, pharmaceutical industry has always been a prominent industrial sector. "A Brief Report Pharmaceutical Industry in India," published in January 2011, said that Indian pharmaceutical industry is a highly organized sector, and it ranks "very high" amongst all the third world countries in terms of technology, quality, and the vast range of range of medicines that are manufactured. The industry is expected go through major transformation in the next ten years and enter the global top-tier. Currently, it's estimated to be worth US$4.5 billion, and is growing at nearly 8 to 9 percent annually.

Last year, McKinsey & Company's report, "India Pharma 2020: Propelling access and acceptance, realizing true potential," predicted that the Indian pharmaceuticals market will grow to US$55 billion in 2020; and if aggressive growth strategies are implemented, it has further potential to reach US$70 billion by 2020. Market Research firm Cygnus' report, published last year in December, forecast that the Indian bulk drug industry will expand at an annual growth rate of 21 percent to reach $16.91 billion by 2014. The report also noted that India ranks third in terms of volume among the top 15 drug manufacturing countries.

India based pharmaceutical companies are not only catering to the domestic market and fulfilling the country's demands, they are also exporting to around 220 countries. They are exporting high quality, low cost drugs to countries such as the U.S, Kenya, Malaysia, Nigeria, Russia, Singapore, South Africa, Ukraine, Vietnam, and more. Currently, the U.S is the biggest customer and accounts for 22 percent of the sector's exports, while Africa accounts for 16 percent and the Commonwealth of Independent States (CIS) places around eight percent of orders, as per Research and Market report. Earlier this year in February, India and Japan signed a Free Trade Agreement (FTA), which is expected to increase the export of pharmaceutical products to Japan. Under the agreement, duties on more than 90 percent of goods traded within a ten-year window have been scrapped.

The exports are expected to increase by 20 percent in 2011, taking the overall value to £6.73 billion. Research and Market report noted that around 56 percent majority of products exported are formulations, while bulk drugs account for a little over 40 percent and herbals for the remaining two percent.

Cygnus report noted that contract manufacturing has been driving the bulk drugs exports in the last few years, and that global pharmaceutical companies have been outsourcing contract manufacturing to Indian companies to cut costs. The recent increase in exports has been due to greater number of expired patents and also countries have started recognizing and accepting generic drugs. Research and Market report said that exports have also received a boost from the industry's overall emergence from the recession.

Indian pharmaceutical industry has taken a quantum leap thanks to The Patents Act, 2005 (Amendment to The Patents Act, 1970). The Patent Act of 1970 saw the exodus of the multinational companies (MNCs) as it recognized only process patents. Indian companies had the freedom to copy drugs manufactured by patent holding companies without paying any kind of royalty. They were protected by the patent act to legally reverse-engineer internationally patented drugs and sell it within India and also in those markets that did not conform to drug patents. Post independence, 1947 to mid 50s, the country's laws recognized both process and product patent. It was expected that the multinational MNCs will bring in their innovations, technology, and finance to benefit Indian customers. However, instead of investing in India, or helping the country's domestic industry, MNCs brought in import of bulk drugs. And, since the patents on essential drugs were with them along with high class technology and financial resources, they were able to establish their monopoly. According to reports, this resulted in high drug prices that were getting beyond the reach of common man and not helping India's interests.

To slow down the control of MNCs and cut down their dominance of the Indian market, the Government passed the Drug Price Control Order (DPCO) of 1970. The order provided process patents for 5 to 7 years and was seen as a move to make the domestic market self-reliant. For the MNCs, India ceased to be a profitable market and they slowly left the country and Indian companies grabbed the opportunity and stepped in. As a result, the country became self-sufficient in the manufacturing of basic drugs. From the 1970s to 2005, many manufacturing units were established and researches were done to develop new processes for several drugs. Also, the DPCO put a limit cap on the prices of essential, lifesaving drugs, resulting in their availability in the domestic market at affordable prices.

The amendment act of 2005 altered the practice of manufacturing drugs without conforming to the patent laws of other countries. The act barred the companies from producing patent products without paying patent royalty. As India had signed the General Agreement on Trade and Tariffs (GATT) and the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement — and joined GATT's successor World Trade Organization (WTO) in 1994 — it had to amend its patent act. The amendment in 2005 opened the doors for MNCs. This time around, they have shed their reluctance to invest in India and are also collaborating with domestic players. Most of these companies are outsourcing their manufacturing to the country. The Indian-based companies with more than two decades of experience in manufacturing drugs — thanks to a process patent system — is benefiting them in the changed scenario. The MNCs are also bringing in their technology and research and development (R&D) team to India.

> They [Indian pharmaceutical companies] are exporting high quality, low cost drugs to countries such as the U.S, Kenya, Malaysia, Nigeria, Russia, Singapore, South Africa, Ukraine, Vietnam, and more.

Indian companies are also continuously increasing their investment in R&D and not limiting themselves to only manufacturing drugs. They are spending around 6 to 8 percent of their turnover on R&D — earlier these companies did not spend more than 1 percent on R&D. "There has been a significant increase in R&D since the introduction of the India Patent Act in 2005," said Brian Ager, the Director-General of European Federation of Pharmaceutical Industries and Associations, in an interview given to a newspaper in India.

Factors such as low manufacturing cost, highly qualified employees with scientific acumen, high technical and manufacturing skills, and knowledge of English are propelling the growth of India's pharmaceutical industry. According to a report, the Indian pharmaceutical industry is also becoming U.S. foreign direct investment (FDI) compliant to harness the growth opportunities in areas of contract manufacturing.

Additionally, the government of India is also providing incentives to encourage investment in pharmaceutical sector and helping domestic players. Under the automatic route in the drugs and pharmaceuticals sector — including the companies using recombinant technology — the government has permitted 100 percent foreign direct investment (FDI). According to a report, the Indian government plans to set-up a US$639.56 million venture capital (VC) fund. This fund is expected to encourage discovery of new drugs and also help strengthen the pharma infrastructure.

The Government has also issued Expression of Interest that says that they intend to facilitate establishing new and also upgrade GLP Compliant Chemical Testing Laboratories; Compliant Biological Testing Laboratories; and GLP Compliant Large Animal Houses. The Government plans to carry out these initiatives via Public Private Partnership (PPP). Through these initiatives the Department of Pharmaceuticals expects to facilitate innovation and catalyze and compliment the R&D efforts of the Indian Pharma Industry

The Department of Pharmaceuticals has prepared a "Pharma Vision 2020" that aims to make India one of the leading destinations for end-to-end drug discovery and innovation. It plans to provide world class infrastructure, internationally scientific manpower for pharma R&D, venture fund for research in the public and private domain and more.

The Drugs and Pharamceuticals Manufactures Association has also received an — in-principle — approval for its proposal to set-up special economic zone (SEZ) for pharmaceuticals, bulk drugs, active pharmaceutical ingredients (APSs), and formulations. The zone will be located at Nakkaplli mandal (Vishakapatnam district), in the state of Andhra Pradesh.

The top ten Indian pharmaceutical companies are Ranbaxy, Dr. Reddy's Laboratories, Cipla, Sun Pharma Industries, Lupin Labs, Aurobindo Pharma, GlaxoSmithKline Pharma, Cadila Healthcare, Aventis Pharma, and IPCA Laboratories. A-P

Continued from Page 24

their eyes and their movement. Also, I've read books written by them and watched films about them. I always thought about how to be more like Sua on the set. I usually make up a solid character before the shooting, but this time was different. I had to go over rehearsals and fit into the circumstances that Sua would have done. I always thought about how the blind would feel and react to the film, so I couldn't move on to the next.

How was playing the blind character?

Kim: Acting the blind was hard, but even harder part was tracing a hit-and-run accident as a blind woman. Getting bruises all over the body was very natural. I was fortunate to complete the shooting with no broken bones. To meet the shooting schedule, I had to be careful, but was always fearful in the dark. There was a battery scene played by my double. She cried because of the hardship and I cried even more for her.

What was the hardest part in acting?

Kim: The hardest part was my visibility. I'd unknowingly move my eyes and hesitate. But one day, I fell down not knowing what a step way from me was. Regardless of the pain, I was so glad that I could finally act in the dark.

Last comment?

Kim: I was so lonely and feeling stuck during the shooting, I guess I was so channeled to the Sua character. I wasn't in this kind of mood in any of my previous works. I hope many people enjoy the film and cheer for me and Sua. A-P

Q&A In-Ho Seo

CEO of Daeyoon Scale Industrial Co, Ltd

BY STAFF REPORTER

Can you explain to us the products your company produces and its significance in the industry?

SIECOM mainly produces industrial measuring equipment, such as chloride-meters, concrete aerometers, and unit measurement devices. We also produce filed installation purpose water quality analysis instruments - Ph measuring instruments, dissolved oxygen meters, and suspended solid densitometers. These are our main products.

What is the key philosophy that SIECOM pursues?

SIECOM has been researching, developing and manufacturing products with the solid conviction of our mottoes: Our Technique is the World's Technique and Be the Best in the Country. With this process and continuous effort, our ultimate goal is leading the development of the measuring instrument field in the country. SIECOM aims to develop the domestic measuring instrument to make the country less dependent on imports, and able to export goods.

Daeyoon Scale Industrial Co.,Ltd. has been producing high quality products. What are some of the efforts SIECOM has put forward to maintain high-quality products?

We've bought high-end experimental instruments and conducted specialized internal environment experiments. Also, we've provided our employees the opportunities to participate in various measuring instrument-related workshops. With this constant diet of information on the industry, we can always guarantee that our products are the best in the field.

What were some of the efforts Daeyoon Scale Industrial Co., Ltd. has done to correspond to the digital trend?

On the production side, we've manufactured different styles from other market products. For instance, we've invented a digital-oriented air content tester, which differs from most other air content testers which are analog.

On the work ethic side, we've tried to keep up with the current market trends in several ways, including updating the SIECOM website, making sure we are compatible with Internet search engines, and providing newly-launched smartphones to our staff for their communication efficiency and a wider social network.

Recent water quality analysis instruments in Korea's power plants are from SIECOM. Please tell us more about that.

Nuclear power plants have heavily depended on exports. However, since SIECOM began as the first success company in the Ultra Pure Water (UPW) manufacturing field in Korea in 2006, we've started installing it. It directly produces Demi Water (DI) in the power plant process with more detailed sensors, bringing in fact better credibility than other imported products. By using a sensor that measures a low concentration sector, it's designated to manage various processes, being applied to MLSS, Turbidity, On-Line Chloride, ORP, and SS testers. Furthermore, field credits include the DI Water production section, Sample Rack, Sewage Treatment, Distillery Wastewater Treatment, and some water quality inspector processes. Our major accounts are 5 Korean power plants and Korea Hydro & Nuclear Power Co.

What is the product designed for improving dietary life?

It's a portable salinity tester, which shows the percentage of sodium in food. It examines the percentage of sodium first, and then helps to cut down on sodium step by step according to a user's planned schedule. The practical thing about it is that it can be used for hot food like soup. Business platforms of its application are the home, restaurants, and experiment labs.

What's the quantity measuring instrument in your catalog? Can you please let us know the main characteristics of this product? What are its main benefits?

Concrete's intensity is commonly evaluated by a strength test after 28 days of snow. When an incongruity decision is given, reconstruction is technically almost impossible, so the compounding ratio of soil moisture content and percentage of raw concrete is vital. In Japan, the nation where earthquakes often occur, quantity measuring instruments are even more vital. The reason for the solidity of Japanese buildings is in fact from their concern of quantity measuring instruments. SIECOM's quantity measuring instrument is composed of an air content tester, automatic scale, laptop, and communication module.

Daeyoon Scale Industrial Co.,Ltd. has also emphasized continual customer satisfaction investment. Why is continual customer satisfaction investment important?

SIECOM is a domestic brand. The evolution of capital stop is important for every company, but since we have to compete with foreign companies, the evaluation of CS is even more important. SIECOM is not a company that aims to sell a lot of products, but the company that sells credits with responsible products. SIECOM has been trying to meet consumer satisfaction, providing continuous updates on the product and fast after-service. This is how SIECOM has been running with a good reputation for the past 30 years, and we believe it will lead the company to step forward internationally.

To what countries is Daeyoon Scale Industrial Co.,Ltd. exporting to, and is there any plan of expansion?

SIECOM is exporting to 21 countries, including Singapore, Malaysia, Thailand, India, Germany, France and Saudi Arabia. We will visit Jordan soon for further market expansion, and we are now in negotiation with buyers in Australia, Peru, and Chile. While building and keeping a good relationship with them, we'll challenge the US-dominated market step-by-step.

Recently India-Korea business ties have been growing very rapidly. More than 300 Korean companies have already opened branch offices in India. Do you have any plan to expand your business to India?

We are already exporting our products to India. As our business grows we might be interested in exploring the Indian market more seriously. India as a growing market has great potential for growth and for our products. In the near future we will look for new partners in India who will like to do business with us. I think some of our products will be very good for the Indian market and have high sales potential. We will look for new opportunities in this growing market.

What are the future plans for Daeyoon Scale Industrial Co.,Ltd.?

SIECOM will keep trying to succeed in domestically producing complete goods. Securing talented workers and a work incentive for our employees will be needed to achieve that. Also, we have an ambitious export plan in which our export performance exceeds the domestic sales to be recognized as a world-class company. Our dedication is not just to make our company's own profits, but to contribute and add value to the market as a whole. A-P

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Tablet PC Revolution in East Asia

BY RAJANI BABURAJAN

East Asian countries, especially China and Korea, are prepared to beat the Apple iPad.

Several new manufacturers have started shipping tablets which are appealing to the masses, mainly because they are cost-effective and also because they support advanced technologies. Here's a deeper look into the current market.

The timing would have been no better for the launch of Apple's iPad than the current decade which is marked by mobility and social media revolution. The cute and smart tablet from Apple has created a new wave in the PC market, challenging the existence of high-end computing gadgets like laptops and desktop PCs. Following the success of iPad in the U.S., several PC/mobile manufacturers have shifted their focus to this magic device that wraps up the computer in your palm. East Asian countries, especially China and South Korea, are not behind in the race to adopt this latest gadget craze. Several tablet makers are getting their arsenal ready to beat the competition from iPad.

The evolution of the Tablet PC is due to the fact that consumers want something more portable than a laptop, more powerful than a netbook, and more comfortable than a smartphone and a Tablet PC could very well fill all of those needs, according to Renub Research.

Emerging Tablet Market in South Asia

According to Global Sources' "China Sourcing Report: Tablet PCs," suppliers of tablet PCs from China are luring customers by adding more functions to beat the competition faced by Apple's sleek iPad. They are also decreasing price to beat competition. Just within one month after the iPad was launched in the country, 60 percent of China's netbook manufacturers and many of its portable media player suppliers started rolling out tablet PCs as cost-effective alternatives to iPad. Global Sources finds that Chinese manufacturers are adding competition by adding enhancements like Webcams, e-book readers and GPS functions in their tablets. Despite these enhancements, they are offered at competitive prices.

Global Sources predicts China's output of tablet PCs is expected to surge 20 to 30 percent this year from nearly 2 million units in 2010. The most popular tablet model is the 7-inch version. This is partly due to their lower price and partly due to their portability, the features that appeal to the youth market. The study predicts that the 7-inch models are likely to have around 60 percent production share while the 8- and 9.7-inch versions will gain 15 percent and 10 percent respectively.

In early last year, research firm IDC had predicted that tablet shipments will touch 46 million in 2014. This figure could be too trivial considering the explosive demand rising for tablets worldwide. Recently Renub Research released their report titled, "Worldwide Tablet PC Present and Future Market Scope (2010 - 2015) and its Impact on Various Sectors," which stated that worldwide tablet PC unit sales will cross 100 Million Units by 2015.

East Asia is not far behind in the race for mobility and social networking through tablets. Renub Research finds that while the U.S. and Western Europe together holds 75 percent of Tablet PC unit sales share, they are gradually losing their share to China and Korea. India, the other prominent country in the region, will also see a rise in demand for tablet PC during the period from 2010 to 2015.

A recent market research from GfK Asia estimates that some 261,000 tablets spanning almost ten brands were sold across seven Southeast Asian markets from January to April this year. It is estimated that by 2015 Asia will account for about one-third of Tablet PC sales.

The price war has already begun in East Asian market. GfK Asia's retail tracking finds that average prices of tablets have crashed by 23 percent during the first four-month period this year in the region. The average price of a tablet was around $600 in April. This, according to the report, is down by 23 percent when compared to January's average pricing across the region.

Tablet Technology Trends

Tablets are becoming attractive thanks to the support to latest technologies like Wi-Fi, 3G and LTE/4G. Tablets are also able to meet today's consumer demands for high speed and Web connectivity. According to GfK Asia,3G and 4G enabled tablet sales contribute to nearly four-fifths (79 percent) of overall sales units across the seven countries studied in the research.

If mobiles have thinned the communications barrier among people mainly through voice and text messages, tablets are going deep into their heart offering a bunch of capabilities including but not limited to voice, video, chat, instant messaging (IM), collaboration, Internet TV, and more. These capabilities make tablets the omnipotent communications gadget of the future. Tablets have already created waves of success among enterprises through their high-end capabilities for enabling cost-effective communications like VoIP telephony and collaboration and presence.

Tablet Brands in East Asia

Tablet PCs running the Android operating system have risen to popularity in East Asia. According to Gfk, nearly half of the tablets (46 percent) purchased in April were running Android, compared to just 13 percent in last November.

"GfK's retail audit across the seven Southeast Asian markets showed that similar to smartphone trends, Android OS has also been gaining traction in the tablets arena since the last quarter of 2010. More manufacturers are banking on the current Android craze and choosing this platform for their tablets, resulting in consumers being availed more options of Android tablets to choose from," said Gerard Tan, regional account director for IT, GfK Asia.

Among the competing tablet PC brands in East Asia include Huawei, Samsung, HTC, ZTE, RIM, Lenovo and several small players. Huawei recently introduced MediaPad, their first tablet to run Android. Featuring a 7-inch display and running Google Android 3.2 Honeycomb operating system, Huawei's Mediapad weighs only 0.86 pounds, much lighter than the iPad2.

Earlier this year, Samsung officially launched two of their most famous Galaxy Tablets – Samsung Galaxy Tab 8.9 and Samsung Galaxy Tab 10.1 in Asia. Both GALAXY Tab 10.1 and 8.9 feature Samsung's own TouchWiz user interface implemented on the Android 3.0 (Honeycomb) platform. The tablets are characterized by their superior multi-tasking and enhanced user interaction and navigation.

Another popular 7-inch tablet from HTC – HTC Flyer – hit Asian markets in April this year. This Android-powered tablet targets the entertainment and gaming markets. More competition is in the cards in the East Asian market, with other leading brands like Dell and Asus preparing to launch new tablets in the coming months.

Meanwhile, ZTE announced it may launch tablet PCs running 4G network technology in some Asia-Pacific countries next year if market conditions become conducive. ZTE is waiting to see if the demand for 4G tablets will materialize, according to a report from Dow Jones. ZTE introduced its Android-based devices in the fourth quarter of last year. The company is investing heavily in advanced technologies like 4G/LTE for its mobile devices to sustain in the highly competitive Asian markets, and expects to achieve a 30-40 percent compound annual growth rate (CAGR) over the next five years.

Other leading brands of tablet PCs include RIM BlackBerry Playbook, Lenovo music pad, Malata Zpad and Suerpad. To join the fray are a large number of little-known manufacturers vying for their small bite on the big apple.

Future Trends Competition and Consolidation

The wider adoption of tablet PCs in Asian markets will have an adverse effect on Apple's market share. As local tablet manufacturers compete with global giants, the price war will get fiercer. iPads, though gaining popularity in the West, may lose its market share as adoption of tablet PCs from other manufacturers will increase in the highly populated East Asian region. The impact will be visible in the next couple of years, according to industry analysts. Meanwhile the tablet PC market in Asia will also witness consolidation. When it comes to choosing personal gadgets like smartphones and tablet PCs that are increasingly being used in workplaces and personal lives alike, people do not compromise quality. This trend could hit the sales of small tablet PC vendors who may lag behind the leading vendors in offering quality and technology, so the chances of their flourishing are meager.

Innovation Wins

Technological innovation could be another major trend that could alter the growth curve of tablet PC makers in the region. With China at the forefront of LTE revolution, tablet makers could very well utilize the opportunities in this area. Companies that succeed in adapting to new technologies at greater speed will enjoy success. Adding innovative features to existing models also could bring significant advantages. Tablet companies should be able to anticipate the needs of customers and roll out innovative features well on time when the demand rises in the market.

The Apps Market

When iPhone hit the market in the 2000s, no one had expected that this smartphone could bring such a revolution in mobile applications. App manufacturers are going crazy creating applications for smartphones. There's a flood of apps ranging from geo-location to shopping and creating flip books to sending kisses. The same is going to happen with iPad and other tablets. With the growing use of tablet PCs for enterprise

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Apple to Pay Fine in Rulings Due to Location Scandal

BY MATTHEW WEIGAND

A few months ago the Korea Communications Commission (KCC) investigated both Apple Inc. and Google to confirm rumors that the iPhone and Android operating systems were keeping a record of their users' geographic locations in unsecured text files.

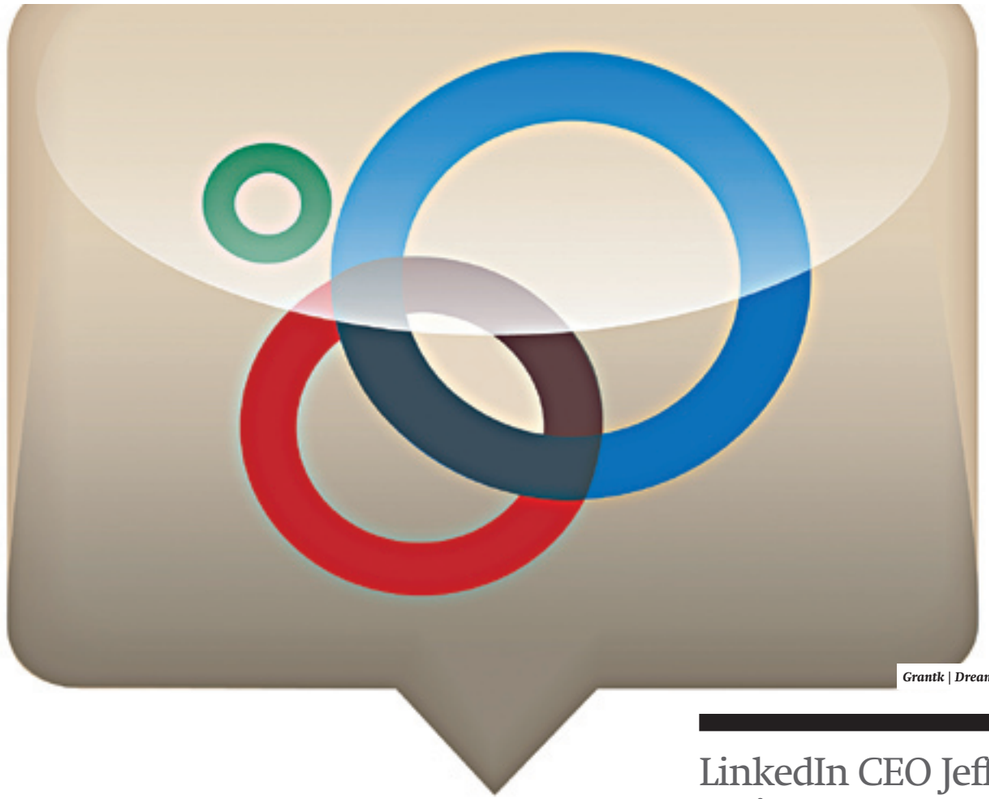
Now, on August 3rd, the KCC has come to a conclusion with its investigations and slapped Apple with a 3 million fine. This comes right on the heels of an additional 1 million ruling last month when an administrative court ordered the company to pay a South Korean attorney who claimed damages through the iPhone retaining his location information. The combined 4 million in losses that Apple suffered these past two months are in South Korean won, however, not dollars. In dollars the two fines amount to about $3,700. To put this in perspective, Apple's net profit for this quarter amounted to $7.31 billion. The penalties are extraordinarily lenient compared to what could have been done – the KCC could have suspended Apple's business license and fined it up to 3 percent of the company's profits.

The drop-in-the-bucket fine that the foreign company has to pay is only the first of possibly many more to come, however, as the ruling gives precedent to an upcoming class-action lawsuit being filed by Miraelaw in Seoul. Nearly 28,000 Korean owners of iPhones have signed up for the lawsuit, which if successful may cost the company up to 27 billion won, which works out to a slightly larger splash in the bucket of $25.5 million.

When asked for a statement, Google Korea was able to say that it had not received a fine. This comes several months after Google Korea's offices were raided and the company's computer hardware confiscated in a high-profile investigation into these allegations. Around the same time, Naver and Daum, South Korea's two largest search engine companies, filed anti-trust complaints against the online search giant. Perhaps the Korean government thinks Google has already suffered enough harassment.

This location-tracking controversy originally came to light in April of this year in the United States, when interested parties discovered that the iPhone stored latitude, longitude, and timestamps in a hidden text file. While some smartphone users would no doubt like to publish that information in real-time to all of their friends, others might prefer to keep it a secret. Apple's official response to the story was to issue an official statement clarifying what exactly was going on. The statement read, "The iPhone is not logging your location. Rather, it's maintaining a database of Wi-Fi hotspots and cell towers around your current location, some of which may be located more than one hundred miles away from your iPhone, to help your iPhone rapidly and accurately calculate its location when requested."

The KCC noted that the judgment against Apple is final and not eligible for appeal. The commission also instructed both Apple and Google Korea to stop the "illegal action" of saving user locations and encouraged both companies to help their users better understand the capabilities of their handsets in tracking their location. A-P



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Do More with Google Plus

BY RAJANI BABURAJAN

There's a space on the earth where you can do whatever you want: love, hate, do business, market your product, play, watch entertainment clips, sing, shoot, and whatnot.

It's social media, the most crowded space on the earth, but that which expands every second to accommodate more and more people. Yes, it's this space on the Internet where the focus of companies is shifting. The latest to hit this space is Google. With the launch of its new social networking site, Google is once again in the race to compete with social media majors like Facebook, LinkedIn, Twitter and MySpace. Google+, which was released early in June, is still in beta, but has already claimed to have beaten Google's expectations.

On July 15, just a few days after the Google+ beta was launched, Google CEO Larry Page confirmed that the social networking site has surpassed 10 million users. Leading business incubator IdeaLab predicts that Google+ could reach 100 million users faster than any other service in history. The service has seen greater adoption in Asia. According to the statistics available from Find People on Google Plus, six of the top 10 countries active on this social networking platform are from the Asian continent. However U.S tops the list, taking approximately half of the share. South Asian countries like India, Sri Lanka, Nepal and Pakistan are on the top list, giving indications that Google+ can improve its count quickly by capitalizing on these dense markets. Initial trends indicate that this social networking tool will emerge as the fastest growing social networking medium in the world.

The impact of social media on businesses cannot be ignored. Though social networking sites were initially launched with an aim to connect individuals, they have now become mainstay marketing channels for brands. The launch of Google+ conforms to the company's strategy to get its share from business users as well. Experts say there's more businesses can do with Google+ than Facebook and LinkedIn. No doubt, Google is giving sleepless nights to Facebook and LinkedIn. In his reaction to Google+'s arrival in the market, LinkedIn CEO Jeff Weiner commented that "there is no room for Google+ in the social networking world because it's already populated by Facebook, LinkedIn and Twitter."

> LinkedIn CEO Jeff Weiner commented that "there is no room for Google+ in the social networking world because it's already populated by Facebook, LinkedIn and Twitter."

However, market reactions indicate that there's more to worry for LinkedIn and Facebook. Google is yet to launch business profile pages on Google+. The impact of this will be much higher than the business promotional opportunities offered through other social media. Thanks to the advanced platform created by Google+ that allows users to upload photos of their latest business feats and corporate updates.

Google+ has an advantage over other social networking tools because it is owned by the major search engine. Companies are looking at Google+ as the best social medium to promote their brands. They think an impressive Google+ profile will earn them impressive page rank and invite better traffic to their Web site. Moreover, users of Google products like Gmail, Orkut and Picasa Albums will find it easier to integrate them with Google+. Google recently updated Picasa Web Albums with a number of advanced features including automatic sync (with your permission) of photos from your Android device. Google has plans to integrate Orkut with Google+. Rumors also have it that Orkut will be wiped out from the social networking arena in the near future. A-P

Super-Fast 4G Wireless Service Launching in South Korea

BY ANURADHA SHUKLA

The tablet PC market is currently at 13 million in the worldwide market and this is expected to jump significantly to 30 million units next year.

According to recent surveys conducted by Ovum and Telecom Asia, tablet devices was identified by respondents as driving 25 percent of the mobile broadband market, next only to smartphones which came in first at a high 50 percent. This is just a clear indication of how popular smartphones and tablets devices are in today's modern society.

This trend is similar in most parts of the globe and is clearly very evident in South Korea whose 9.7 million smartphone users account for 20 percent of the country's 50 million total mobile phone users.

Among South Korea's service providers, SK Telecom leads the pack with 5 million smartphone subscribers, followed closely by Korea Telecom (KT) at 3.7 million and LG Uplus at 1 million subscribers. Most new mobile phone purchases in the country are smartphones and the number of users is expected to reach 20 million by the end of this year.

To support this growing demand for smartphone and tablet computers, South Korea's top mobile carriers are upgrading their systems and will be switching to a super-fast 4G wireless service based on Long-Term Evolution or LTE technology. This super-fast system can support the ever increasing data traffic and usage that made these devices so popular worldwide – and will be fully available in South Korea on a national scale by 2013.

Existing Wireless Communication Services in Korea

Currently, South Korea's wireless services are based on mobile WiMax network technologies or the IEEE 802.16e International Standard, which is popularly called in the country by its South Korean service name WiBro. Korea Telecom (KT) was the first to launch this service commercially in June 2006 and was made available nationwide on March 2011. SK Telecom followed suit and offered the Wave 2 version of the WiBro service, but is limited only to major cities and highways.

KT plans to upgrade their WiBro services to 10 Mbit/s connection speeds which is ten time what they are offering now. SK Telecom on the other hand will not go down the WiBro path and instead would switch to the Super-Fast LTE system once their current license for the 2.3 GHz frequency system expires by 2012. This move is in anticipation of the ever increasing popularity of tablets and smartphones in the country which is expected to account for 90 percent of mobile phones in South Korea by 2013.

> Smartphone users account for 15.2 percent of SK Telecom's total mobile subscriber base, but the company is targeting to increase this number to 10 million subscribers this year.

This popularity has exploded in recent years and South Korea's current 10 million total smartphone users are expected to double in number by the end of this year. Smartphone users account for 15.2 percent of SK Telecom's total mobile subscriber base, but the company is targeting to increase this number to 10 million subscribers this year. KT on the other hand is targeting 6.5 million smartphone subscribers this year, which currently accounts for 67 percent of its total subscriber base.

The New Evolution in Super-Fast Wireless Services

With LTE at the core of its system, SK Telecom expects their wireless services to be 1.9 times faster than WiBro, and will allow their users to download large content in a matter of minutes. LTE has a maximum downlink speed of 75 Mbps which is faster than the current 37.5 Mbps that WiBro offers. Maximum uplink speed of 37.5 Mbps for LTE is also faster in comparison to WiBro's 10 Mbps uplink speeds.

SK Telecom will start offering LTE services during the second half of 2011 and is expected to immediately attract 300,000 users. To ensure the success of their LTE services, SK Telecom has deployed 1772 Radio Units (RU)) and 609 Digital Units (DU) to support its LTE network across Seoul and ensure seamless and flawless super-fast 4G wireless services in indoor, underground, and all other areas in the capital. A-P

FURTHER READING:

- **PsysOrg**
  www.physorg.com
- **AsiaOne News**
  www.asiaone.com
- **The Chosunilbo**
  www.english.chosun.com

COMPANIES MENTIONED IN THIS ARTICLE:

- **SK Telecom**
  www.sktelecom.com
- **Korea Telecom (KT)**
  www.kt.com
- **LG Uplus**
  www.lguplus.com

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and commercial use, tablet apps could become the next big thing in the industry. Considering the all-pervasive nature of tablets (in home, entertainment, business, banking, education, research, etc.), the scope for tablet apps is beyond imagination.

Winning Edge for Service Providers

Days are ahead when tablet PCs will drive the demand for digital content and services. Telecom service providers could very well utilize this opportunity to connect people through these smart devices and repeat the success they gained from the smartphone boom. With the launch of technologies like 3G and LTE in major East Asian markets, telecom operators have set their gears ready to invade the tablet PC market through advanced communications services like high-speed Internet, Instant Messaging and collaboration. VoIP could be another major trend impacting the market of tablet PCs. VoIP is gaining popularity among home users as well as enterprise customers due to low-cost international calling facility. Though VoIP adoption is restricted in some of the markets, a greater number of tablet users will depend on VoIP providers like Skype and Google to connect with their friends and relatives.

Tablet: The Cure for Recession

Tablets are much cheaper than high-end PCs, and they perform almost all operations as that in a PC. This high-end mobile device will enable companies to get their employees at work on the go and stay connected when the situation demands. With the help of features like video conferencing and collaboration on tablets, enterprises can facilitate better interaction with employees and clients, improving productivity and reducing travel costs. However, there are certain limitations to tablets mainly because of their small size and lack of fully featured keyboard, which could prevent their wider adoption among enterprises. A-P

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Pakistan's Energy Struggle:

A Crisis in Perspective

BY PETER ALLAN MARIANO

Karachi is Pakistan's main economic, banking and industrial center and home to the country's largest corporations.

At the height of its popularity, it was globally known as the "city of lights" and a strong symbol of Pakistan's economic growth. However, Pakistan is currently facing the worst energy crisis it has had in history, stalling further economic development and plunging cities like Karachi into darkness – unplanned power outages that last eight, ten or, even twelve hours.

Pakistan's government and its people are scrambling to adopt all possible measures to mitigate this crisis: from load-shedding and energy conservation on a national scale to utilizing all available forms of energy production the nation could muster. The country is also working plans for importing energy from neighboring countries like Iran as well as harnessing the alternative energy resources of solar, wind and hydroelectric power to generate electricity.

Unless Pakistan addresses the underlying problems behind this energy struggle and makes a serious and determined effort to develop a comprehensive energy policy, the nation would have to face a serious stagnation in its economic growth and development as well as delay improvement for its citizens' quality of life.

Pakistan's Current Energy Needs and Generation Capacity

According to estimates from the Pakistani government, generation capacity should increase by at least 50 percent by next year in order to meet the continuing increase in demand. For the past several years, Pakistan has become heavily dependent on imported petroleum products brought about by a significant increase in oil consumption and the lack of internal refining capacity to support the country's own oil production.

The Pakistan Energy Year Book released by KASB Securities reported that in 2010, 38 percent of Pakistan's total electricity generation came from oil. Natural gas and hydroelectric comes second, each accounting for 29 percent of power generation, while the remaining percentage comes from nuclear and other power generation resources.

- **Energy Deficit –** The state-owned Pakistan Electric Power Company or PEPCO reported that the country has a power shortage ranging from 1,500 to 2,500 megawatts per day during the winter season, which shoots up to 3,000 to 4,500 megawatts during summer. Currently, the country can only generate approximately 11,500 megawatts per day which is not enough to support the 14,000 to 15,000 megawatts of daily demand.
- **Gas Shortage –** Most of Pakistan's domestic natural gas production is consumed internally, and rising needs will force the country to explore import options to sustain this demand growth. LPG or liquefied petroleum gas and CNG, or condensed natural gas, is used primarily by household and motor vehicles and a lack of supply is disrupting daily activities in most urban areas. Daily gas production is only at 4.5 billion cubic feet and is way below daily consumption demands of 6.5 billion cubic feet as of June this year.

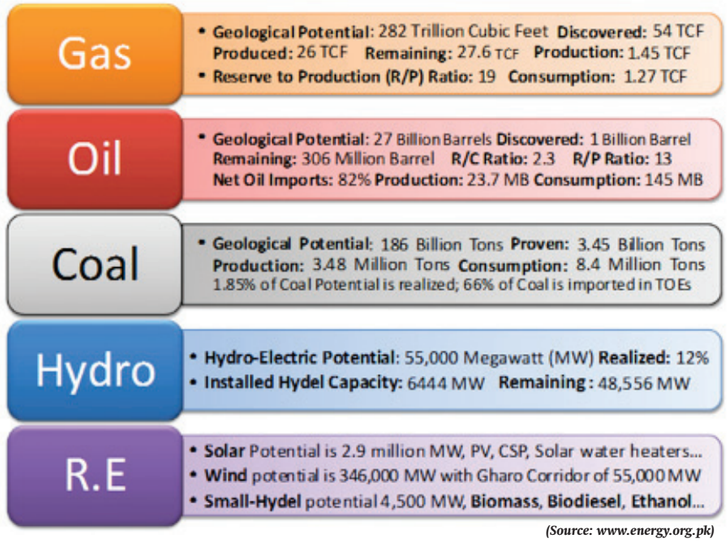
What's Behind Pakistan's Energy Crisis?

The Pakistani public is in an uproar resulting from this lack of energy and disruption of normal day-to-day activities. Many believe that the crisis was brought about by energy mismanagement by Pakistan's ministry officials as well as energy executives. Others blame the crisis on corruption and apathy from their own government officials.

According to energy analysts however, Pakistan's struggle with energy is brought about by the failure to generate enough capacity to support the country's economic growth. The country has been overly reliant on oil-based electricity and problems with global price fluctuations and internal production inefficiencies compounded the country's energy woes even more.

Critics from around the world pointed at Pakistan's slow action in adopting and developing alternative and renewable sources of energy – relying too much on imported petroleum products to support its economy. The diagram above from the report "Energy Security of Pakistan: Prospects and Challenges" presented by Mr. Azim Riaz, and energy expert and researcher, clearly shows the potential Pakistan has for energy generation using different resources – but only a small percentage is realized and into production due to lack in investments and infrastructures.

Aside from the lack of investments and infrastructures to support Pakistan's energy needs, there are other problems brewing that are threatening to compound the country's energy woes even more. Recently, the Karachi Electric Supply Corporation (KESC) which is Karachi's largest and main energy provider has been trying to cut costs by laying off more than 4,500 workers – sparking an industrial dispute with employees' unions who have now launched a massive indefinite strike, crippling operations even more. The KESC has been plagued with distribution losses, with up to 30 percent of



(Source: www.energy.org.pk)

electricity generated lost or stolen due to illegal connections by Karachi residents rigging distribution wires and power meters.

Impact of Pakistan's Energy Struggle

Pakistan's energy crisis is severely affecting the country's social and economic fabric, with a third of the country's 170 million people living below the poverty line affected the most. 60 percent of the population subsists on less than US$2 a day, and with a high inflation rate of 15 percent, these people can barely afford to pay for most household essentials and basic necessities. With energy bills continue to skyrocket and lack of supply disrupting socio-economic activities – the country is faced with its worst dilemma in ages.

- **Business Slowdown –** Pakistan's industrial sector has lost more than US$4 billion during the last 18 months due to energy shortages. Power disruptions that last up to 8 or 12 hours a day occur during critical business hours, affecting sales and business activities in the commercial and industrial sectors. Load shedding affected the country's manufacturing industries, resulting in up to a 40 percent rise in their overall cost of production. Companies who cannot keep up are forced to shut down or lay-off a significant number or their workforce.
- **Civil Unrest –** The lack of electricity and gas, leading to business disruptions and unemployment is sparking massive protest actions across the country, with strikes occurring every day in big cities and disrupting daily Pakistani life even more. Media has shown protesters venting their anger and frustration at Pakistani authorities, and many escalating into riots with people setting tires on fires, destroying parked cars, and inflicting damage to offices owned by the electric companies. In a statement from Mahfooz Elahi, President of the Islamabad Chamber of Commerce and Industry, he feared things could get worst and said, "I think if this energy shortage continues, the public will get fed-up, and there are chances of an uprising like in Tunisia or Egypt, although the cause might be different".
- **Economic Stagnation –** As the country's industries struggle with power shortages, Pakistan's GDP growth and struggling economy is pulled down even further. Large companies can keep up for a while by draining funds to import large power generators. However, small to medium enterprises which have always been the backbone and primary driver of Pakistan's economic growth cannot afford such capital-intensive machineries – forcing many to close down or putting thousands of people out of work.

Strategies to Overcome the Energy Need

To stem the tide of the worsening energy crisis and prevent the further downfall of the country's economy, Pakistan's leaders have adopted multiple avenues and strategies to overcome this energy struggle.

- **Load Shedding –** Cutting down on power is a logical but should be a temporary step to take whenever the demand for energy is more than what generation capacity can provide. However, the country has been implementing load shedding for three years now and has actually doubled in duration over the last 18 months and has affected various sectors of Pakistani society. Energy officials are doing their best to keep the power shortages according to announced schedules to allow people to plan their energy usage accordingly, and prevent random cut-offs that severely disrupts households and businesses.
- **International Support –** Pakistan is seeking support from the international community for energy supplies and financial advisory services. Foremost among these initiatives is the planned Pakistan-Iran gas pipeline project, with Iran pumping 750 million cubic feet of gas daily to Pakistan by the year 2014. The Pakistani government has assigned the Inter State Gas System (ISGS) Company as project manager and has invited Expressions of Interest (EOI) from both foreign and local banks. Aside from the pipeline, the country is also planning to import up to 500 million cubic feet per day of LBG or Liquefied Natural Gas by next year, with up to 17 international and local firms showing interest in the project.
- **Building Alternative Power Plants –** The Pakistani government is also planning on tapping alternative energy resources as a more permanent solution to the energy crisis. These projects included the building of new coal power plants, hydro-electric dams, tapping of gas reserves in Balochistan, wind energy and solar energy power plants. Pakistan has the sixth largest coal reserves but only 5 percent of this capacity is used for energy generation. There is also a great potential for solar energy, with the country enjoying nine to ten months of sunlight throughout the year. Another renewable energy resource with the biggest potential in Pakistan is wind energy, particularly with the enormous potential for wind power along the Karachi to Gwadar coastline.

Future Trends and Outlook into Pakistan's Energy Sector

Unless long term solutions are established, the energy crisis in Pakistan is expected to get worse in the coming years and has the potential to last until the year 2018 if the power demand in the next seven years is not factored in. The energy shortfall is currently at 3,000 to 4,500 megawatts but has the potential to skyrocket to 20,000 megawatts in the next ten years unless a clear and working energy policy is established.

FURTHER READING:

- BBC News
www.bbc.co.uk
- The Epoch Times
www.theepochtimes.com
- The Express Tribune
www.tribune.com.pk

COMPANIES MENTIONED IN THIS ARTICLE:

- KASB Securities
www.kasb.com
- Pakistan Electric Power Company (PEPCO)
www.pepco.gov.pk
- Inter State Gas System (ISGS)
www.isgs.pk

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Singapore Facility to Desalinate Seawater with Minimum Energy Use

BY PETER ALLAN MARIANO

Fresh water is one of the most important necessities for sustaining life.

Its importance is made even more evident in countries surrounded by either sand or sea – where getting a constant supply of fresh water to sustain its inhabitants is a topmost priority. In island nations such as Singapore, where the growing density of its population prompts the need for increasing reliable freshwater resources, developing innovative means of saving or recovering freshwater is a national priority.

One such technology is recovering freshwater from seawater through the process called desalination and Singapore has always been at the forefront of developing such technologies born from a need of reducing dependence on imported freshwater. However, the process of desalination involves an intensive use of energy, another important national resource the country cannot afford to waste. Aside from that, generating the energy required for the desalination process increases the country's carbon footprint and impact on the environment.

Recent developments in a Singapore facility however, will revolutionize the desalination process by cutting down on the energy required to desalinate seawater and convert it for potable use by as much as 50 percent. The new breakthrough, which was developed by Siemens Water Technologies' Global R&D groups, uses an electric field to desalinate seawater, and is much more energy efficient than reverse osmosis, the most efficient desalination technique employed today.

The process has already showed great results in Siemens' pilot facility in Singapore. Once such facility is placed on production mode at a much larger scale, it will practically solve Singapore's energy issues with desalination, assuring an abundant source of potable water for future generations. From Singapore, this technology will also be crucial in mitigating the need for potable water in various regions around the world suffering from lack of freshwater resources.

Singapore's Water Supply System

Since the building of Singapore's first reservoir at MacRitchie in 1867 by the British, there have been many developments and innovations in the country that were all intended for increasing the freshwater supply in this island nation. Reducing its reliance on neighboring countries such as Malaysia, Singapore embarked on several big water projects to boost the country's sources of potable water.

Such projects include Singapore's first reclaimed water plant in 2002 and its first desalination plant in 2005. Currently, 40 percent of the Singapore's freshwater is supplied by Malaysia while another 30 percent comes the nation's efficient water reclamation facilities produced by the NEWater factories and operated by Singapore's Public Utilities Board. NEWater is also the brand name used for the reclaimed water produced by these facilities.

20 percent of Singapore's water supply comes from internal rainfall catchment facilities while only 10 percent comes from the desalination plants operated by SingSpring, which also markets the bottled Desal H20 produced in these plants. In a highly urban country like Singapore, with a constantly growing population, limited geographical territories and practically no natural freshwater sources – the energy efficient desalination technology developed by Siemens would come as a very welcome development.

Singapore: Global Hub for Water Recycling and Desalination

The technology behind Siemens energy-saving desalination system makes use of electrodialysis, which uses an electric field to attract the positively and negatively charged ions of salts from the seawater. The process is being further improved by experts from Siemens Corporate Technology at Singapore's research center for water treatment systems called the WaterHub.

This technology will make Singapore the world's global hub for water recycling and desalination and will bring this technology to other parts of the world that are also in need for a sustainable and abundant resource for potable water. With the global water consumption expected to rise by more than 40 percent during the next 15-year period, Singapore's role as a technological hub for water research and development will help ensure that these future water needs will be met. A-P

FURTHER READING:

- **PsysOrg**
  www.physorg.com
- **Webwire**
  www.webwire.com

COMPANIES MENTIONED IN THIS ARTICLE:

- **Siemens**
  www.siemens.com
- **NEWater**
  www.pub.gov.sg
- **SingSpring (CitySpring Infrastructure Trust)**
  www.cityspring.com.sg

Knowledge Management in Asia-Pacific Organizations

BY SHAMILA JANAKIRAMAN

"Water, water everywhere but not a drop to drink."

This saying could apply to the abundant sea water everywhere on this earth which is too salty to drink. Similarly, we are flooded with raw data, and unless we have the ways and means to tap into this vital resource it will be nothing but sea water to us.

Raw data has to be channelized in suitable ways to convert it into useful information which gives knowledge about certain things.

Data is nothing but an event which has no meaningful relationship to anything and is just out of context. When we try to introduce some context or relationships with other data we get information.

When we get a pattern relationship connecting the data and information, the pattern slowly emerges into knowledge. It is called knowledge only when we can realize and understand the patterns and their implications. When we understand the foundational principles responsible for the patterns representing knowledge we arrive at wisdom. Simply put this is Knowledge Management. However, the process is not as simple as it sounds.

Data comprises of just some figures in numbers or words. Information relates to description, definition, or perspective including details like who, what, when, and where. Knowledge which can be derived from this information encompasses strategy, practice, method, or approach, which answers the question 'how.' This knowledge leads to wisdom or principles, insight, morals, or archetype, answering the question of why?

To explain further with an example, let's consider a factory. The numbers 500, 1000, and 2000 mean nothing at all. They just form pieces of data. When we say that these numbers are the number of tools manufactured in January, February, and March respectively then we get information as there is now context.

The varying numbers in production were due to an increase in the number of laborers. This detail gives us the knowledge that more people produce more tools increasing the output of the factory. This knowledge leads to the wisdom that in order to increase production more input in the form of laborers, raw materials, and other facilities are required.

The principle stems from the fact that any action which produces a positive result encourages more of the same action, resulting in an emergent characteristic called growth, opine experts in this subject.

The flow of activities from the time we get data to the time we derive wisdom from it to achieve something forms a continuum:

Data > Information > Knowledge > Wisdom

This means that data which is a discrete entity progresses to become information, then knowledge, and lastly wisdom all happening in a continuous state as we understand the relationships that give information, patterns that represent knowledge and the principles of wisdom.

Knowledge Management, or KM, enhances an organization's ability in defining a mission, in effectively addressing competition, enhancing performance, keeping abreast of changing conditions, and how to manage them. Hence we can say that KM refers to the ability of an organization to deal with today's situations while at the same time planning for the future. The information available now and from similar periods in the past helps managers envision the future situation and take necessary action.

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This is applicable to predicting sales during lean periods as well as festivals, production levels in factories, inventory planning, logistics arrangements, and so on. The best and most possible action is selected.

KM Strategy

Environmental changes and marketplace demands require organizations to address needs and issues and launch activities and initiatives which match the real challenges facing the organization. Besides certain typical situations, different organizations face unique issues to address. The KM strategy should suit the actual needs faced by the organization.

In the case of call centers which form the front end of many organizations there is a need to satisfy customers who expect immediate solutions to all their queries. Also call centers feature a high-pressure, closely monitored environment involving expensive training sessions for employees. The KM need is immediate and is bound to affect sales and the reputation of the organization.

Other front-line staff like sales staff and service personnel come in direct contact with customers. Most often they work away from the head office and due to limited communication, sharing of information is hindered among employees placed in different locations. Here KM helps in ensuring consistency, accuracy, and repeatability.

OmniTouch International with offices in Singapore and Malaysia offers training and certification, mystery shopper, and customer satisfaction research for the contact center and customer service industry. It enhances KM by offering services encompassing operations management, customer relationship management, essential skills management, and call center operations management all based on knowledge gathered.

In business management the real challenge is to segregate the relevant information from the abundant information available in order to support business decisions. Decision-making by management staff is supported by KM which provides the relevant information, besides mentoring the managers.

An aging workforce creates the problem of knowledge loss when long-serving staff retire. The wealth of knowledge they have accumulated should not leave the organization with them. This knowledge needs to be captured and managed for the sake of the continuity of business operations and for the younger staff to rely on. The level of knowledge within an organization can be maintained by KM which offers a structured mechanism for information capture and transfer of knowledge when older staff retire.

The transfer of knowledge from the older employees to the younger generation is of utmost importance, especially for a country like Japan with a dwindling workforce. According to a Hays survey, 70 percent of organizations feel that the aging population has affected their business. Some companies have started looking for alternatives to retain workers by raising the retirement age. Japan needs to take rapid action to transfer the knowledge to maintain competitiveness among its emerging neighbors.

In the case of rapidly evolving industries such as IT, consulting, telecommunications, and pharmaceuticals, innovation is the key to ensuring long-term growth. Efficiency of time-tested processes and products are relied upon and innovation does not seem to appeal to such organizations. But innovation should be encouraged in the form of new techniques. KM promotes innovation in any business environment.

India-based e-Zest serves companies in the IT, finance, healthcare, legal, sports, manufacturing, travel, and education fields. It develops and implements efficient and continuous processes in which knowledge is identified, captured, validated, structured, stored, and disseminated. This knowledge is then managed by appropriate Information Technology and media infrastructure. The company employs Web 2.0 technologies to build products and solutions.

e-Zest KM solutions help clients provide better services and products for their customers, enabling a better application of ideas and innovations. It gives access to best-in-class methodologies, competitor and market intelligence, and the ability to deliver continuous learning. It also reduces the loss of knowledge through staff turnover.

Top-Down and Bottom-Up

Factoids

- KM enhances an organization's ability to define a mission, to address competition effectively, to enhance performance, and to keep abreast of changing conditions.
- Any action which produces a positive result encourages more of the same action resulting in an emergent characteristic called growth.

Every organization is characterized by its purpose and activities, culture, size, geographic spread, staff skills, history, resources and marketplace. Based on these, the KM strategy is worked in two fashions. The top-down method leverages the strategic direction of the organization to arrive at the focus of the KM initiative via various activities. In the bottom-up method, research is done involving the activities of staff working on key business processes. The results highlight staff needs and issues which can be addressed through KM initiatives.

In a Chinese dining corporation in Hong Kong, KM is used to gather tacit knowledge from the chefs. This helps in managing daily operations in the restaurants and making decisions with the chefs. Since KM makes people share their knowledge with each other, the company will not be affected even if one of the chefs or restaurant managers leave.

To encourage the crew to share, an atmosphere of knowledge sharing is created by providing training courses and holding meetings. One of the meetings is called Bottom to Top, which requires only the branch subordinates to attend. The moderator will take charge of the meeting and the focus group will be asked some questions about their work conditions. So the crew in the meeting can express their ideas and feelings as their bosses would not attend the meeting.

The KM strategy enables the senior management to understand the way the organization operates and the issues confronting it. Staff needs and issues can be dealt with by launching activities and initiatives which give a measurable impact on the organizational functioning. This reveals business benefits besides ensuring long-term growth and stability.

KM in Asia-Pacific

Being new comers to industrialization Asian firms leveraged the idea of joint ventures and collaborations to access critical knowledge and technologies. This led to

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World's First Large-Scale Spherical OLED Screen Developed in Japan

BY DING DING

Spherical displays people see in malls and sporting events use an interconnected series of light emitting diodes (LEDs) to project various images, graphics and patterns.

Although such scenes are amusing to see, the quality of images projected are not that comparable to what one can view on their TV screens. Now, imagine viewing high definition video images of the earth and all its geographical wonders and beauty, not on a flat TV screen – but on a display screen with the shape of the earth itself.

This is what Mitsubishi Electric previously accomplished when it installed a six-meter Organic Light Emitting Diode (OLED) globe at the National Museum of Emerging Science and Innovation in Tokyo to commemorate its 10th anniversary. Called the Geo-Cosmos display, the large-scale spherical OLED screen is the world's first and was built from 10,362 pcs of 96x96 millimeter OLED panels attached to an aluminum spheroid structure.

Understanding OLED Technologies

During the last decade, advances in Liquid Crystal Displays (LCDs) and Plasma screen technologies have revolutionized the quality of displays for both computer and multimedia use. With new technologies such as Organic Light Emitting Diode (OLED) screens, display technologies are brought to even higher levels of efficiency, flexibility and mobility never before possible with traditional TV screens.

OLED displays project brighter and clearer images with good contrast even at large viewing angles. Aside from that, OLEDs consume less power than LCDs which make it a more viable option for large scale use. OLED screens use organic materials that already have self-luminescent properties – they generate their own light which means there is no need for a backlight for illumination as in the case of LCD displays. This characteristic of OLEDs makes it possible to create flexible display of all shapes and contours and its intrinsically wide viewing angle make it suitable to display images even if the display is formed into a sphere.

Large-Scale Spherical Screens and Other Possibilities for OLED

The Geo-Cosmos OLED globe was created by a team formed by Mitsubishi Electric with three other companies including Dentsu Incorporated, Go and Partners Inc. and GK Tech Inc. which handled certain aspects of the globe's construction including project planning, image processing and transmission, and the spheroid design. With a resolution of over 10 million pixels, which is ten times higher than current LCD display capabilities, the OLED globe is expected to display a truly awesome projection of the earth and other images.

Previously, display globes of this magnitude were formed using light emitting diodes but the quality of display is nowhere near the high definition, clarity and contrast that OLEDs can provide. To commemorate the museum's 10th anniversary, the new OLED globe created by Mitsubishi Electric will display clouds and other earth sceneries taken from an orbiting meteorological satellite. Viewed from a large scale spherical screen, museum visitors and other spectators will be treated with a different kind of perspective in viewing earth scenes – a totally different experience from what they have seen on their flat TV screens or in the movies. A-P

FURTHER READING:

PsysOrg
www.physorg.com
Tokyo Tek
www.tokyotek.com
Engadget
www.engadget.com

COMPANIES MENTIONED IN THIS ARTICLE:

Mitsubishi Electric
www.panasonic.net
Dentsu Incorporated
www.dentsu.com
GK Tech Inc.
www.gk-design.co.jp

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Is China Engaging the US in a High-Tech Arms Race?

BY ANURADHA SHUKLA

Last year, the United States completed delivery of a US$6.4 billion arms package to Taiwan, including ballistic missile defense systems, utility helicopters, and mine sweeping ships.

This sealed the completion of the security cooperation agenda between the two countries. Aside from that, the United States has solidified its alliance with its allies in East Asia and has been holding large-scale naval war games near these territories – a bit too close to China's backyard. This fueled resentment from the nation prompting China to freeze military relations with the western nation.

Recently, it's the United States and its allies in the West Pacific who have been getting a rash of harassments from China's People's Liberation Army Navy as well as from Chinese fishing vessels entering highly disputed maritime areas. Aside from that, the United States was clearly frustrated by China's uncompromising position regarding international security concerns, particularly those involving nuclear proliferation in the Korean peninsula.

But what's more concerning for Washington and the Pentagon is China's rapid advances in military technologies, seemingly prompting a new Sino-US high-tech arms race in the Eastern Asian region. News reports are emerging of China's emerging stealth fighter capabilities, anti-aircraft carrier ballistic missiles, futuristic electromagnetic pulse weapons, cyber warfare, and the crown jewel of China's military force – its own fleet of aircraft carriers.

The recent visit by Chinese President Hu Jintao to the United States in January and the just-concluded China-US Strategic and Economic Dialogue between US President Barack Obama and President Jintao's special representatives last May was a boon to Sino-US cooperative relations. However, beneath the choreographed handshakes and smiles, there still lies the uncertainty of a brewing high-tech arms race between the two powerful nations.

Regional Disputes and China's Military Reach

Recent maritime disputes in the Eastern Asian seas between China and neighbors Vietnam and Philippines have placed a cloud of concern over the area, pushing many countries in the neighborhood worrying for temperatures to further rise. China is indisputably a dominant maritime power in the area, but there are clear indications that China is taking this a bit further and is poised for a military arms race with the United States.

In a statement from Dr. Andrew Erickson of the US Naval War College, he said: "China does not want to start a war, but rather seeks to wield its growing military might to 'win without fighting' by deterring actions that it views as detrimental to its core national interests." Dr. Erickson is an expert in China's military capabilities and he described China as projecting its military power well beyond its current strategic horizons. This is apparent in the following weapons systems expansion the Chinese nation is currently engaged in:

- Stealth Fighter Capabilities – The unveiling of the radar-evading Chengdu J-20 is China's entry into the foray of elite countries with fifth-generation stealth fighter capabilities
- Anti Access / Area Denial System – The military strength of the United States is its ability to rapidly deploy aircraft carriers and warships should there be conflict in a particular area of interest, in this case the East Asia region. Knowing this, China has been developing long-range ballistic missiles capable of targeting any moving ship at sea. This anti-access or area denial strategy will give China a greater advantage by preventing US carrier battle groups from intervention
- Aircraft Carrier Capabilities – There are now confirmed reports about China's first aircraft carrier. China is undergoing reconstruction of an old USSR aircraft carrier called the Varyag that failed completion when the Soviet Union collapsed during the early 1990s

Although in terms of hardware and technologies, these advances in China's military might is still inferior to their counterparts in the United States and other Western countries, but these enormous undertakings in China's military is placing a cautionary stance among military experts in Washington.

Flying Stealth Capabilities

When the stealth fighter Chengu J-20 took its maiden flight last January, it coincided with the Beijing visit of US Defense Secretary Robert Gates. Experts like Douglas Barrie from London's International Institute of Strategic Studies stated that the J-20 is still way below the technical capabilities of its US counterpart. However, military analysts saw this coincidence as a deliberate signal from China – a clear indication of their intent to put these capabilities into service at a very rapid rate.

Aside from the J-20, China has also developed their new J-15 Flying Shark strike fighters which according to Aviation Week & Space Technology journal are largely based on Russia's Sukhoi SU-33 jet. The SU-33 is an all-weather fighter jet with folding wings and is designed for carrier-based deployment. This similarity in design made experts conclude that China's Flying Shark is intended for operations with the new aircraft carrier China is planning to put into service.

China's Anti Access/Area Denial Strategy

China's strategy of preventing entry to US carrier battle groups with ballistic missiles should there be conflicts with Taiwan and in the East Asian region was coined A2/AD or Anti Access / Anti Denial by Pentagon military planners. China is developing a formidable array of torpedoes, cruise missiles and Anti Ship Ballistic Missiles or ASBMs that could hit targets beyond its shores. Chinese ASBMs with the greatest capabilities would be the DF-21D (called CSS-5 in the West) which has a range of 1,500 km and can be deployed from a land-based system using a wheeled transporter vehicle.

The ability to target moving US aircraft carriers however would depend largely on an advanced space-based targeting capability. Aside from that, the weapons should also have the ability to penetrate the US ballistic missile defense umbrella to be effective against US carriers and warships. To work around this, either the Chinese develop a more superior space based targeting system or develop a submarine-launched ballistic missile or SLBM capability. At any case, China's foray into these technologies is giving a cause for concern for US Defense Secretary Robert Gates and the rest of Washington.

Symbol of China's Rising Military Power

The crown jewel to China's maritime ambition and rising military power would be a deployment into service of their own aircraft carrier battle group. For months, several speculations from various military experts around the world were either overstating or understating China's plans into this naval arena. However, recent pronouncements from China's Defense Ministry attempts to put things into a clearer light.

In a press conference, Geng Yansheng, a spokesperson from China's Defense Ministry formally announced that China is indeed retrofitting an old Soviet Union aircraft carrier shell the country purchased from Ukraine – but will use the platform for scientific research, experimentation and training. The announcement is an official confirmation of China's imminent aircraft carrier program and its intent in modernizing the People's Liberation Army (PLA).

The warship is still unnamed and is making final modifications in the port city of Dalian in Northeast China. It is a medium-sized carrier that will be retrofitted with conventional Chinese engines, radar and hardware capabilities. The carrier will use a ski-jump system instead of a catapult to take off fixed-wing aircrafts.

The spokesperson stated that there is still several works to do before the vessel becomes operation but did not give further details about the warship. Once operational China, which is the only member of the five-nation permanent members of the UN Security Council that lacks an aircraft carrier, will finally have one in its service.

Aircraft Carrier Capabilities Across the World

There are currently nine countries around the world that have aircraft carrier capabilities in their navies. There is a total of 21 carriers in active service among these countries, and soon China will be listed among this elite group.

- **United States –** the US has a total of 11 nuclear-powered Nimitz-class super-carriers including the USS Enterprise. One of these carriers, the USS George Washington, is stationed in Yokosuka, Japan and is very close to China's territorial waters
- **United Kingdom –** The UK has one aircraft carrier called the HMS Illustrious which is equipped with Short Takeoff and Vertical Landing or STOVL aircrafts
- **France –** Charles de Gaulle is the French navy's sole nuclear-powered aircraft carrier and was named after their late president
- **Italy –** The Italians have two aircraft carriers in operation called the Giuseppe Garibaldi and the Gavour both of which were designed for use with STOVL-type aircrafts
- **Spain –** The Juan Carlos I and the Principe de Asturias are the Spanish Navy's two aircraft carriers, with the Juan Carlos I equipped with a ski-jump platform designed for STOVL aircrafts
- **Russia –** With a military heritage it received from the former Soviet Union, the Russian Navy now has the Admiral Kuznetsov in its naval arsenal
- **India –** The country purchased the warship HMS Hermes from the United Kingdom and was retrofit

Continued on Page 49

But what's more concerning for Washington and the Pentagon is China's rapid advances in military technologies, seemingly prompting a new Sino-US high-tech arms race in the Eastern Asian region.

Korea Can Finally Start Playing Mobile Games

BY STAFF REPORTER

In some shocking news last month, Korea's Ministry of Culture, Sports, and Tourism scrapped regulations that essentially prevented mobile games from being sold in the country.

While iPhones and Android phones are both very popular in Korea, the games sections of the App Store and the Android Market were eerily empty. This was doubly strange since Korea was, and still is, the land where computer gaming has been taken to a whole new level.

The now-defunct rules required all games sold in the nation of South Korea to be rated by the Ministry of Culture, Sports, and Tourism. Since Google and Apple had worldwide

Kheng Ho Toh | Dreamstime.com

marketplaces and did not want to have their users inconvenienced by South Korean bureaucracy, both companies simply decided to block the sales of any games in South Korea. However, now, the lifting of the law clears the way for software developers for the iPhone and handsets that run on Google's Android system to offer games in the nation. Sales of mobile games will probably exceed 355 billion won ($333 million) next year, according to the government.

Korean mobile-game developers such as Gamevil and Com2uS may also benefit by offering games on Google's Android Market and Apple's App Store, said Jang. Gamevil's third-quarter sales in Korea may rise as much as 17 percent if the companies reopen their game sections on their local stores, he said. The shares have risen 27 percent this year.

The removal of the regulatory hurdle is a "hugely favorable factor" for Gamevil, Kim Young Sik, a spokesman for the company, said. "Millions of iPhone users in Korea haven't been able to use games until now."

Gamevil's "Air Penguin" was the fourth-most downloaded paid application for the iPhone in the U.S. in April, according to Utrecht, Netherlands-based researcher Distimo.

Com2uS, a Seoul-based maker of iPhone games such as "Third Blade" and "Homerun Battle 3D," is aiming to triple smartphone-game sales to 25.9 billion won this year, said Choi Baek Yong, the company's chief financial officer.

"We're looking at this very positively," Choi said.

Country of Gaming

South Korea is a country full of computer gamers. The land is littered with Internet cafes, called PC bangs, which are always full of chain-smoking, motionless, very serious 20- and 30-somethings killing each other online. This is a country that has recently opened game addiction clinics in order to try to break children of the habits of going online and playing computer games. This is also the nation which has not one but two cable channels dedicated to showing live-action plays of Starcraft, the 10-year-old game by Blizzard. The mobile gaming market will not suffer in such a country. A-P

Hynix Semiconductor Inc. and Toshiba Corporation Collaborate in Making MRAM

BY EUN YOUNG CHOUGH

On June 13th, Hynix Semiconductor Inc. and Toshiba Corporation, the world's two leading semiconductor manufacturers, have announced that they have agreed to a strategic collaboration in making a next-generation memory device, Spin-Transfer Torque Magnetoresistance Random Access Memory (MRAM).

The collaboration of these two companies can be seen as an alliance to keep Samsung from being the sole lead in the semiconductor market. The companies said when the technology development completes, the companies will produce MRAM in a joint venture.

MRAM is a next-generation memory solution, different from Dynamic Random-Access Memory (DRAM), which distinguishes between 0 and 1 by passing an electron trough a capacitor. However, unlike DRAM, MRAM is a type of random-access memory that stores data by using magnetic properties, and it can be de-

Hupeng | Dreamstime.com

termined by measuring the difference in resistance from magnetization on a magnetic tunnel junction (MTJ). By reorienting the magnetization of a thin magnet layer in a tunnel magnetoresistance (TMR) element using a spin-polarized current, the data is written and saved. Certain features including non-volatile memory, power efficiency, and ultra-high speed have made MRAM the promising next-generation memory technology. Companies including IBM, Honeywell, Cypress and Infineon have been working on this technology.

Toshiba wrote that the company recognizes MRAM as an important future generation memory technology with the potential to sustain future growth in its semiconductor business. "We believe that MRAM has huge potential as highly scalable non-volatile RAM," said Kiyoshi Kobayashi, Corporate Senior Vice President of Toshiba Corporation, and President and CEO of Toshiba's Semiconductor and Storage Products Company. "We will strongly promote initiatives in integration of storage solutions including MRAM, NAND, and HDD. The MRAM joint development program with Hynix is one of the key steps to support our efforts."

As for the reason for a joint production, the companies said the 'one reason for merging the necessary resources and expertise from Hynix and Toshiba is to minimize risk and to accelerate the pace of MRAM commercialization.' The two companies also announced they extended a patent cross-licensing and product supply agreements that was reached four years ago.

Oh Chul Kwon, Hynix's CEO said "MRAM is a rare gem full of exciting properties, like ultra high-speed, low power consumption, and high capacity, and it will play the role of key factor in driving advances in memories. It will also be a perfect fit for growing consumer demand in more sophisticated smart phones. MRAM is our next growth platform." A-P

You Would Totally Download a Car

BY STAFF REPORTER

A popular Internet meme makes fun of an Australian anti-piracy ad by asking, in large edgy letters, "You wouldn't download a car, would you?"

The answer to that question is going to be mostly yes, from most people. If you could download a copy of a car and have it in your garage the next morning, or perhaps the next week, there isn't anyone who wouldn't do that. The car companies might go out of business, and the cops might even stop you and take your downloaded car away, but who cares? You could just download another copy tomorrow. But the idea of downloading physical objects may actually become real soon, with the advent of 3D printers.

Making objects whenever you want them used to be in the realm of science fiction. But now, with companies such as Stratasys and MakerBot Industries selling more and more affordable 3D printers, the possibility of designing and printing out your own plastic objects has been realized. Combine those printers with a home computer and a copy of Autodesk and a resource such as the website Fab@Home, and you can conceivably create a garage-based manufacturing center which can produce all the mundane tools and utensils that one needs for everyday life. Also, you could produce custom-fitted prosthetics for amputees, paper-based photovoltaic cells, components for airplanes, medical instruments, and yes – even parts for lightweight hybrid vehicles. You can really, truly download a car.

The 3D printing industry is real, and is predicted to be $3.1 billion in 2016 and $5.2 billion in 2020. It has been predicted by Rich Karlgaard, the publisher of Forbes magazine, as the "transformative technology of the 2015-2025 period." There are many names for this new industry: 3D printers, digital fabbers, RepRaps (from replicating rapid prototypers), and other names. Using a computer model, these machines lay down patterns of plastic, metal powder, or other materials to duplicate cross-sections of an object. If the material needs to be cooked, lasers or ultraviolet light can help with that. This type of additive manufacturing is also appealing to professional factory owners because one system can make any number of a million different things. And because there is no need to chip away extra material, there is less waste in the manufacturing process as a whole. Also, since products can be made where they will be used, warehousing and transportation costs can be eliminated. Imagine an intermediate step between the manufacturing plants of today and the home basement factories of tomorrow – the corner plant. You can simply call your corner store and order a set of plastic forks, or a child's toy, or a replacement steering wheel for your hybrid vehicle, and the store could print it out and deliver it to you in a few hours. Currently the only thing standing in the way of this reality is price.

And prices are falling fast. Ten years ago, a simple 3D printing system cost tens of thousands of dollars. But now 3D printers for hobbyists can be bought from MakerBot Industries for just $2,500. And kits that one can use to assemble a RepRap printer have been sold for $500. In just a few years devices such as these can be created for mass production and sold at computer or home appliance level prices.

One of the goals of some 3D printer makers is to make a 3D printer which can then create itself again by 3D printing out its own parts. This is somewhat difficult, as the frame of a 3D printer is best made using metal, which cannot be replicated so inexpensively with the printer. But if an open-source and free printer could replicate itself, it could spread across the entire world in a pattern that would mimic a popular Internet joke or a virus. One printer could make dozens, if not hundreds, more, and each one in turn could be given to another person who would use it to make more printers, and household objects.

Also, while a 3D printer might not be able to effortlessly replicate everything that you enjoy having around in your house, it might easily be able to create everything that at 3rd world village would ever need to create a better standard of living for itself. Couple a 3D printer up with some photovoltaic cells and keep it supplied with whatever it needs to create its products and you have packaged a miniature industrial revolution in a can, which you can then spread throughout the savannahs and jungles in the harder-to-reach sections of the world. An affordable, self-sustaining 3D printer could do more to relieve human suffering than anything else imaginable.

Of course there would still be limitations to the technology. The goop, or gunk, or whatever technical term you would use to describe the material that the printer uses to make its stuff would still be valuable. People would have to ration it in resource-scarce areas, and buy and sell it. Also, the appeal of non-3D printed objects would probably increase, causing their prices to go up. People may have easy access to the simple, plastic fork and knife sets, but true status could be shown through hand-carved wooden utensils. Nevertheless the lower limit for human misery could be reached, and everybody in the world could go up one more step on the stairway to utopia.

Another factor would be the designs. Many designs could be open-source and easily accessible to everyone, but someone might have original, artistic takes on your common door-stopper or a lawn chair, which they would either try to keep under wraps or sell for a fee. Then of course an economy of pirated 3D designs would develop in which people would blatantly copy their friend's hard-won beer stein replica from that movie they loved, and soon everybody in the world would have one of those beer steins. It would be a fundamental change in people's relationships with the physical that has not been seen since the original industrial revolution. And this not even a theoretical possibility – all the pieces are in place now. This reporter is half-tempted to buy one of these bad boys right now and start cranking out the custom-designed Star Wars pottery. A-P

Continued from Page 41

rapid development for majority of the firms within few decades. Support came from the governments unlike western nations for the promotion of KM and innovation in the Asia-Pacific region.

National and local governments provided services to encourage corporate innovation and collaboration between national and corporate innovation systems. Also, the national culture and administrative capabilities promoted knowledge transfer and innovation here. The management styles as in Japan were conducive to modification, improvement and technology adoption.

The economic growth witnessed in Japan, Hong Kong, Singapore, South Korea, Taiwan, China, and India prove how effectively KM and innovation have been leveraged to arrive at success, which will also serve as optimum management models for the rest of the world. Companies like Acer, Huawei, Haier, TATA, Hyundai, Lenovo, Mahindra & Mahindra, and Samsung are only a few examples of successful organizations serving this region and the rest of the world.

All Asian countries have varying levels of industrialization, economic growth, cultures and political situations, but they are all characterized by strong institutionalized pressures from governments over economic exchange, traditions, social practices, and culture.

Even large firms are organized in business groups and not as multidivisional firms. Institutional theory helps in KM and in driving innovations in the Asia-Pacific region. KM gets influenced not only by state control in research activities but also depends on social norms connected to knowledge creation, transmission, imitation, and relocation. A technical project or knowledge transfer can be stopped if it goes against social norms of a country or region.

Institutional theory emphasizes that organizational outputs, goals, and actions must be in accordance to institutional rules, norms, beliefs, cultures, and expectations, imposed by institutional environments, especially in countries like China.

Knowledge creation, transmission, and relocation depend on the institutional infrastructure. If the organization fails to safeguard intellectual property rights it discourages innovation. When institutions support IPR, they will encourage more innovation, entrepreneurship, and thus economic growth. In the Asia-Pacific region the piracy of intellectual products is more owing to a lack of strong laws to protect IPR. Asia-Pacific countries are emerging economies and are experiencing rapidly-changing institutional environments with institution-based KM and innovation strategies. A-P

Rise of Humanoids in Asia

BY OLIVER PLAETEVOET

Last month, we introduced the state-of-the-art humanoids produced in several Japanese conglomerates.

Honda's ASIMO was presented as the most advanced humanoid. Toyota and other organizations (including universities) also helped the country of the rising sun to be leader in the field. Here in the article we will be discussing South Korea and other emerging Asian giants in this industry.

South Korea

Likewise Japan, the drop in birthrate obliges South Korea to turn toward service robotics. In addition to the population's openness to the introduction of robots in their lives, the Korean government aims to become a leader in the robotics field by 2018 with the objective of raising its robotic market share from 10 percent now to 20 percent. To achieve this, the government will support projects with other countries, spend 30 billion won (approx. US$28 million) in related investments and create a special zone for robotics.

Korea Institute of Science and Technology

The KIST developed a humanoid named Hubo. Created by Jun Ho Oh, Hubo is able of walking with its legs straighter than other humanoid models. This makes the robot walk faster while consuming less energy. The robot can also give you a handshake and grab objects by adapting his finger shape to the object. It was famous for being given humorously Albert Einstein's head.

Korea Advanced Institute of Science and Technology

Korea Advanced Institute of Science and Technology (KAIST), founded in 1971 in Daejeon, was a key part of Korea's development. The Institute focuses on the services robots can provide. Mahru-Z helps to prepare the breakfast and carries the tray with your morning toast and cup of coffee but the breakthrough with this robot is that his purpose is to look around in the house, discern objects that are not in the right place and therefore understand and execute what needs to be done.

Hanool Robotics

Robots accomplish more than just service in Korea. In this regard, Hanool Robotics' Tiro was the world-first to wed a couple in 2007 in Daejeon, as it performed the ceremony.

Yujin Robot

ROBOSEM made a noted appearance in classrooms. It is important to emphasize that education might be a major function for humanoids thanks to the easier interactions with students.

South Korea is working hard to become number one in robotics. In addition to the government plans mentioned above, every kindergarten should have a robot instructor by 2013. Hence, EngKey will foster in Koreans kids good adaptation capabilities for a world in which robots will have a significant place.

Finally, RobotLand will be the world-first major theme park dedicated entirely to robots. With investment of 784.5 billion won (approx. US$680 million) and located in Incheon, the park hopes to receive 2.8 million visitors each year. Exhibition halls, movies theaters, rides, a robot-themed shopping, robotic competitions, an aquarium full of robotics fish and a research facility give an indication of the scale of the project. As if one project of such a scale was not enough, another park of more or less the same investment (700 billion won) might be constructed in the Southern city of Masan. This park would focus on industrial, health care and underwater robots and hence would not conflict with Incheon's service robot park. The most important indication though is that Koreans are committed to their robotic development.

The Rest of Asia

Following Japan and South Korea which both express strong commitment towards robotics (from companies' leaders and from their governments, respectively), the rest of Asia is more disparate in its robotic ambitions.

China's size and growth does not translate effectively into robotics. Three humanoids have been conceived by the Beijing Institute of Technology. BHR-2, nicknamed Huitong, can perform Tai-Chi and sword art. It can walk at 1km/h and stay in balance on unequal ground. Two BHR-3 models, BeiBei and JingJing, were displayed in 2009. Their sizes are 1.7 meters for 70kg and they have much stronger arms, allowing them to also perform also industrial work. Besides, a few other humanoids with an appearance very similar to humans were developed.

Despite this small introduction to humanoid robotics, China developed a strong interest in the programming of Artificial Intelligence. The China-Brain Project has for its goal the creation of the first artificial brain by using a network of network modules that are partially connected. Broadly speaking, each module performs a task and they all are connected by an operating system to perform as an artificial brain. China took a very unique approach in AI with this project and it shows the Chinese interest in this field.

Taiwan offers some spectacularly funny records. Firstly, the Guinness Book records the smallest humanoid robot in the world: just 15cm tall. BeRobot, manufactured by GeStream Technology Inc., is able to walk, kick and perform push-ups.

The second Taiwanese record is the first kiss between two humanoids - Thomas and Janet - developed by the National Taiwan University of Science and Technology. The development team spent three years to prepare the scene. Professor Chyi-Yeu Lin says the kiss requires sophisticated hand-eye coordinations between the robots.

In Vietnam, robots have been able to play table tennis since 2007 thanks to TOPIO. TOPIO Ping Pong possesses two high-speed cameras that allow the 1.9 meter and 120 kg robot to position its arm exactly to hit the ball with the paddle. Another version of the same robot (TOPIO Dio) is a bartender that will serve your Martini.

And what about AI?

All these examples of humanoid robots mentioned above suggest that the material part has undergone significant improvement since the last decade. However, we are still far away from fully-autonomous robots that can take complex decisions on their own. Now that a material basis is created, roboticists must implement artificial intelligence on this structure.

The challenge of AI and learning

Artificial Intelligence is a branch of robotics that analyzes the environment and according to the information gathered, takes decisions on how the robot should proceed. Analyzing the environment is done easily thanks to the multiple sensors deployed on the robots. The difficult part is to give the robot an autonomous "consciousness". Here, the challenge is to make the system work fast and stable enough so that it can manage all the changes occurring in the unpredictable environment.

Another concern is that Honda's ASIMO was programmed to record the name of objects showed to him and be able to name the object when confronted later. In this regard, ASIMO is taught like a child. But, is this process really comparable to learning? According to Turing, the father of computers, Artificial Intelligence has to be different than a disciplined behavior that would rely on randomness or repetitiveness. Therefore, it is not so easy to certify that ASIMO behavior is in accordance to Turing's definition. Also, nothing proves that ASIMO is consistent in his learning abilities. Anyhow, as controversial as we can be, ASIMO's intelligence is for now still far behind the human's and it is impossible to predict at which rate we are going to progress.

What if we cannot find AI? Looking for another solution.

Some researchers claim that we will never be able to achieve a level of artificial intelligence comparable to a human's. Therefore, Professor Yoshiyuki Sankai of Tsukuba University of Japan invites us to consider an alternative: unite human with machine. This concept, called Cyborg, would allow expanding the physical functions of man while using the human brain. Professor Sankai's HAL5 (for "Hybrid Assistive Limb") is an exoskeleton that covers the entire body by strapping onto the user's arms and legs. The whole equipment is the result of 14 years of research and development and increases the human body's strength by five times.

Is Cyborg the solution? Partially. If research on Artificial Intelligence does not yield the results expected, Cyborg seems the best alternative. However, Cyborg does not provide the autonomous execution of tasks that would be greatly appreciated from a humanoid. However, a success in AI does not imply that Cyborg should be let down.

Humanoids are still far away from being totally autonomous and hence lack their principal quality. However, the improvements made during the last decade are so amazing that it is sometimes hard to believe we are still dealing with machines.

A clear position is that Asia is on the front lines of the robotic development. The leader is Japan; its Asian follower is South Korea. The technological advances acquired by now are beneficial for these countries as it is estimated by the Japanese government that the global market for such robots will expand to 65 billion dollars by 2025. The main question is whether Artificial Intelligence researches will be fruitful, quickly or slowly. In the first case, abrupt (and hopefully positive) changes in the way society is organized might happen. In the opposite case, Cyborg technology will bring interesting opportunities.

Innovation brought by industrial robots in the past benefited the companies that used them. Now, entire communities call for service-robots. Still far from fully-autonomous today but with good prospects, it might be the time to place your bet on this new sort of technology. A-P

Olivier Plaetevoet is a master's student at the Solvay Brussels School of Economics and Management. Interested in new technologies, he decided to come to South Korea as an exchange student in 2011 and write this article as part of an internship in the country.

Transparent Loudspeakers Developed by Korean Researchers

BY ANURADHA SHUKLA

Graphene is a revolutionary new material that is making quite a buzz in the technological world due to the immense possibilities the material can do for the entire technology field.

Several studies in developing the material for various industrial and commercial applications is currently underway and one such research involves the use of graphene in creating transparent loudspeakers – using an ordinary inkjet printer to transfer the material onto a sheet of plastic.

The research team, led by Jyongsik Jang from Seoul's National University, developed the revolutionary speakers that have several potential applications including sound systems for displays, windows or they can be used as noise-canceling devices. Using readily available materials, the team used a new method of developing graphene films by depositing graphene-oxide onto a layer of PVDF, or poly vinylidene fluoride, to create a lightweight and extremely thin loudspeaker that it looks practically transparent – opening a new door for next-generation sound system technologies.

The Evolution Called Graphene

Many may be familiar with graphite or the substance used for pencil lead. Graphite has a special form of carbon that conducts electricity and is formed by several layers of sheets that looks like a honeycomb or a chicken wire mesh – but at an atomic scale level. Each of these sheets is called graphene and its unique properties make it one of the most versatile and exciting substances ever discovered.

Graphene is flexible and can be stretched like rubber but what makes it remarkable is the fact that it is stronger than diamond and is an excellent conductor of electricity. The technique for isolating a single layer of graphene was developed by Andre Geim and Konstantin Novoselov, Russian scientists working at the University of Manchester in the United Kingdom. Because of the immense potential of graphene for various industrial applications, the two scientists were awarded with the 2010 Nobel Prize in Physics.

Creating Transparent Loudspeakers

When they created the transparent loudspeakers using graphene, the researchers from Seoul University made use of a simple four-step process starting with synthesizing Graphene Oxide and exfoliating the material in water to remove impurities and prevent it from clogging the inkjet printer nozzles. The material is then placed inside an empty inkjet cartridge.

With the graphene ink prepared, the next step is to prepare the surface where the material will be printed. The team made use of a piece of Poly vinylidene fluoride (PVDF) sheet and treated the surface using a low temperature oxygen plasma treatment process. The treated PVDF sheet is then printed on both sides with the graphene ink using an ordinary inkjet printer to form the graphene electrodes, and the output was immediately soaked in ammonia solution and hydrazine for 3 minutes inside a vacuum chamber.

The final step is to hook up the electronics, the same sort of materials and parts used in regular speaker systems. When electrical signals are applied, a piezoelectric effect is generated that causes the PVDF sheet to distort and create sound waves. The resulting speaker is still crude and a lot of improvements still need to be done to improve the sound quality and bass response according to the research group. Once developed, the process will be a cheaper and more efficient way of creating thin speakers that can be used on windows, displays and computer screens. A-P

FURTHER READING:

- **PsysOrg**
  www.physorg.com
- **Pal Science**
  www.palscience.com
- **Graphene-Info**
  www.graphene-info.com

Q&A Big Words on Small Things: Louis Ross Explains Nanotechnology

BY VICTOR FIC

American citizen Louis Ross (ross@virtusensors.com) was a research associate at the American Enterprise Institute in 1991-92. He earned a Masters degree at Johns Hopkins focusing on the technology industry financing the US and Japan. Then came post-graduate research at the University of Tokyo's Faculty of Law on commercial, securities and finance law. Louis also worked as an equity strategist and consultant to technology start-ups and Fortune 500 companies in America, Japan, Europe, and the Middle East and for the Office of Naval Research and Army Research Lab. He is the CEO of Virtus Advanced Sensors, Inc. (www.virtusensors.com), a leading micro technology venture company. It commercializes the next generation of MEMS motion sensor technology for the consumer, industrial, healthcare, medical, sports and defense and aerospace industries — a cutting edge 21st century industry. He gave this exclusive interview to Victor Fic (vfic@hotmail.com) and will speak this fall in Prague.

What does a technology industry strategist/analyst do?

He functions as both economist and industry sector analyst. He examines macroeconomic factors and entire industry sectors and also individual companies. I have covered technology sectors including semiconductors, wireless, Internet, automotive and pharma to formulate investment strategies. My colleagues and I developed emerging technology detailed reports about key enabling and potentially disruptive emerging technologies like flat panel displays, wireless cell phone networks, Internet, and micro-technology. The semiconductor industry is a micro-technology that grew quickly after the first computer appeared because the private sector standardized processes, scaling functionality to reduce size and costs. The key to building this sector and other nascent technologies was government investment, and in the US this was directly related to defense.

Your firm's focus is on the "lineage" of emerging technologies — meaning?

Every technology has a birth, a gleam in the eye of a university or private company researcher before or after a direct government or private sector need exists. For emerging technologies, the often long term R&D costs far outweigh, in the short term, the immediate benefits to industry. The government must seed research so experimenters can develop ideas and the intellectual property to build the knowledge base so the technology can be commercialized.

So it all starts with creative ideas...?

Yes, this "blue sky" or "green field" research effort is dreams at first. But maybe the government or private sector has a present or future need to develop the technology. The government's investment reduces the private sector's R&D costs and so risk when deciding what to commercialize. This scaling helps government by reducing procurement costs.

Why is the issue of lineage important?

It illuminates what will impact markets, the wealth of economies and the rise and fall of nations. On average, new technologies may take 15-25 years to incubate before commercialization. So tracking how they evolve is vital. Often, a technology starts one way but morphs into different things.

You say you are a pioneer here...

This "technology lineage" concept, well, I developed it and will detail it in a book eventually, so this interview is a unique statement. Actually, I apply the idea to identify potential opportunities and threats. For example, a company must see new and potentially disruptive technology that impacts its existing business and or the industry. Disruptive means technology that forces companies to adapt or fail because it trumps existing tech in functionality, capability, size, price or factors combined.

Your main priority is related to micro MEMS — explain it in layman's terms.

The layman should learn because it is changing all our lives. MEMS means Micro Electro Mechanical Systems. It includes inertial sensors — in fact, thats what we do, such as gyros and accelerometers. We are developing the first true single-chip 6 degrees of freedom and beyond motion sensors. I can send readers pictures of our tiny chip. MEMS devices are mechanical and microscopic and the prelude to the nanoscale.

Your prediction is that it will be the main driver of government commercial industrial policies. Be more specific.

Micro and nanotechnology are the priority emerging technology focus of industrial policy in the developed and emerging world because they are so broad based and will impact every major industry — technology or otherwise. For example, nanotechnology currently is focusing on novel materials with properties never before achieved and carbon nanotubes are the strongest material known to man. This video offers a summary... http://bigthink.com/ideas/24632. Now nanotechnology is at a much smaller scale than MEMS — compare our chips to an ant. We will see breakthroughs in MEMS many decades before the nanotech stuff occurs...but when the latter will dwarf previous technology breakthroughs.

You mean in history?

I mean any and all previous breakthroughs man has devised up until now.

The state is often a player here, correct?

Governments have seeded micro/MEMS/nanotechnology projects over the past 20 years with an uptick during the past decade. Competitiveness here is a cornerstone of a country's economic, political and social future.

For our readers who are investors, what are the implications?

The commercial value of these new technologies is staggering. Our market for motion sensor devices and applications products alone is nearly US$25 billion and it is still in its infancy.

You claim that your experience of diverse cultures confers a unique perspective on new technology development, funding and commercialization. How so?

Cultures approach technology development and commercialization very differently. Strengths and weaknesses appear when people innovate — the Americans rely more on free markets, East Asians on government industrial policies. I see a chance to spot technology arbitrage opportunities. It means technology or an idea developed here may have a different, unique or better use else where. One country may lead in generating the initial idea while another acts as the commercialization platform. One country may excel at cheaply copying another's inventions.

Another example is nanotechnology. Breakthroughs will come from the materials sciences first. For example, someone develops a way to mass produce high quality carbon nanotubes and string them together. You suddenly have revolutionary new materials for new and old objects — smaller, lighter, stronger and cheaper. Japan and Germany have ardently maintained a strong skill set in advanced precision manufacturing and will greatly benefit.

You note that many of these activities meld governments interacting and "collaborating" with private sector. Provide examples.

In the US, the defense department sustains the robotics industry. In Japan, government and industry collaborate to select appropriate targets for industrial policy measures like those that made Japan a leader in materials science, display technology, automobiles, etc. Take Taiwan, a country with barely over 20 million people who were subsistence farmers a few decades ago. It now possesses the world's largest semiconductor foundry companies. Both were government planned and nurtured. Taiwan is now fueling China's bid to become a much larger version of itself, with Taiwanese companies helping to finance and run high tech operations on the mainland.

> Micro and nanotechnology are the priority emerging technology focus of industrial policy in the developed and emerging world because they are so broad based and will impact every major industry — technology or otherwise.

Is this good?

Is it better than free market allocating valuable resources? Recent economic crisis provides shows the market can waste resources just like an inefficient, incompetent government. Some technologies, like some public goods, should be the government's responsibility so as to produce domestic wealth. You can now see competing systems here. The West's systems were dominant in so many categories. If this is not true in the future, what will be the new standard? Results outweigh faith. A-P

Continued from Page 43

ted and transformed into the INS Viraat, India's sole aircraft carrier

- **Thailand –** The country is the first nation in Southeast Asia to have an aircraft carrier in its naval service after it purchased the STOVL carrier HTMS Chakri Naruebet from a Spanish shipbuilding company
- **Brazil –** The country purchased the Sao Paulo from France, which in 2000 and became the Brazilian Navy's flagship and sole aircraft carrier
- **Japan —** The East Asian nation does not have a full-blown aircraft carrier but Japan's Maritime Self-Defense Force operate two Hyuga-class helicopter carriers which the country classifies as helicopter destroyers.

Future Chinese Weapons?

China's conventional military capabilities is still inferior with their US counterparts, but recent developments in the country's military power is a clear indication of its intent to be at par or even jump ahead of US military capabilities in the Asia-Pacific region. One strategy that the PLA may employ is a multi-layered approach to cripple an adversary's military capability in one fell swoop using space, cyberspace and information operations – a high-tech approach that would bridge China's military gap with the US.

Such futuristic weapons include directed energy, jamming and cyber attack weaponries with the intent of paralyzing an enemy's military machine and gain the upper advantage with conventional capabilities. Part of this is advanced anti-satellite (ASAT) weapons systems which the PLA is said to have successfully developed and tested.

Other developments include the use of electromagnetic pulse (EMP) or high-powered microwave (HPM) weapons which China is reportedly developing according to a report from the National Ground Intelligence Center. These weapons have the capability of knocking out electronics and computers over a wide area – giving a technologically inferior country like China and advantage over the US military forces. A-P

FURTHER READING:

- **BBC News**
  www.bbc.co.uk
- **The Washington Times**
  www.washingtontimes.com
- **Xinhua Network**
  www.news.xinhuanet.com

COMPANIES MENTIONED IN THIS ARTICLE:

- **US Naval War College**
  www.usnwc.edu
- **International Institute of Strategic Studies**
  www.iiss.org
- **National Ground Intelligence Center**
  www.inscom.army.mil

Asian-American Develops Energy-Harvesting Shock Absorbers

BY KEVIN LIU

For years, car manufacturers have been trying to develop innovative ways to improve a vehicle's fuel efficiency and increase the average miles per gallon (mpg) that a particular vehicle can run on.

This need has been brought about by the fact that only 10 to 16 percent of a car's fuel energy is used to overcome air drag and road resistance to drive the car. The rest of this fuel energy is simply lost to exhaust heat, energy dissipation resulting from vibrations, and even the basic act of braking.

Many car manufacturers are focused on improving the car's design to minimize drag and resistance, improve brake design to make them more regenerative, or throw in an electrical power source as with the case of hybrid vehicles. Now, a new innovation in transportation technology is taking shape, this time focusing on vehicular inefficiencies – vibrations, bumps and other movements in a vehicle's suspension – converting them all into electricity.

An Asian-American professor and his team of researchers have recently developed an energy-harvesting shock absorber that not only improves a car's fuel efficiency by up to 8 percent, but will also convert the vibrations in the car's suspension system into electricity. According to the researchers, even if only 5 percent of the total 256 million registered vehicles in the United States adopt this energy-absorbing technology, the total energy that can be recovered each year can be more than the amount of power generated by the Niagara Falls Plant – and has the potential of creating a six-billion dollar market.

Vaclav Volrab | Dreamstime.com

An Asian-American professor and his team of researchers have recently developed an energy-harvesting shock absorber that not only improves a car's fuel efficiency by up to 8 percent, but will also convert the vibrations in the car's suspension system into electricity.

The People behind this Innovation

The technology behind the energy-harvesting shock absorber was developed by Professor Lei Zuo of the State University of New York (SUNY) at Stony Brook, together with his graduate student team composed of Xiudong Tang and Zachary Brindak. With funding coming from the New York State Energy Research and Development Authority (NYSERDA), the team developed high-energy density retrofitable prototypes at their Advanced Energy Research and Technology Center (AERTC) lab.

Addressing the large amounts of energy wasted by a vehicle's movements, the team designed and patented both linear and rotational shock absorber prototypes. The linear shock absorber design makes a hollow coil tube which contains a smaller high flux intensity magnetic tube sliding inside. The rotational shock absorber on the other hand makes use of a compact motion magnification mechanism to generate electricity.

Because of the tremendous potential that this new energy-absorbing technology can deliver, Dr. Zuo and his team were awarded the R&D 100 Award by R&D Magazine, a prestigious technology award aptly nicknamed the "Oscars of Innovation" given to the top technological innovations of the year. People would be quite familiar with previous recipients of this award which included the flashcube, the ATM or automated teller machine, the fax machine, the halogen lamp, liquid crystal displays, and the HDTV.

Implications for the Automotive Industry and the Environment

According to the researchers, energy-harvesting shock absorbers can generate up to 400 watts of electricity during normal driving conditions, and as much as 1600 watts of electricity on rough roads. Off-road vehicles can get even higher electrical output depending on off-road conditions. The harvested energy would then be used to charge the vehicle's batteries and power up other sections of the car. This would reduce the load exerted on the alternator and the engine, resulting in better fuel efficiency.

The fuel efficiencies may not seem much for individual vehicles but considering the 256 million vehicles that will be using this technology, the amount of fossil fuel saved would be quite considerable from an economic and environmental standpoint. The shock absorbers can be retrofitted to most modern vehicles without the need for any modification in the vehicle's suspension system and can actually give better suspension control than standard shock absorbers. The results are a vehicle that saves gas, has less impact on the environment, and a much smoother ride. A-P

FURTHER READING:

- **Asian American E-Zine**
  www.aaezine.org
- **PsysOrg**
  www.physorg.com
- **R&D Magazine**
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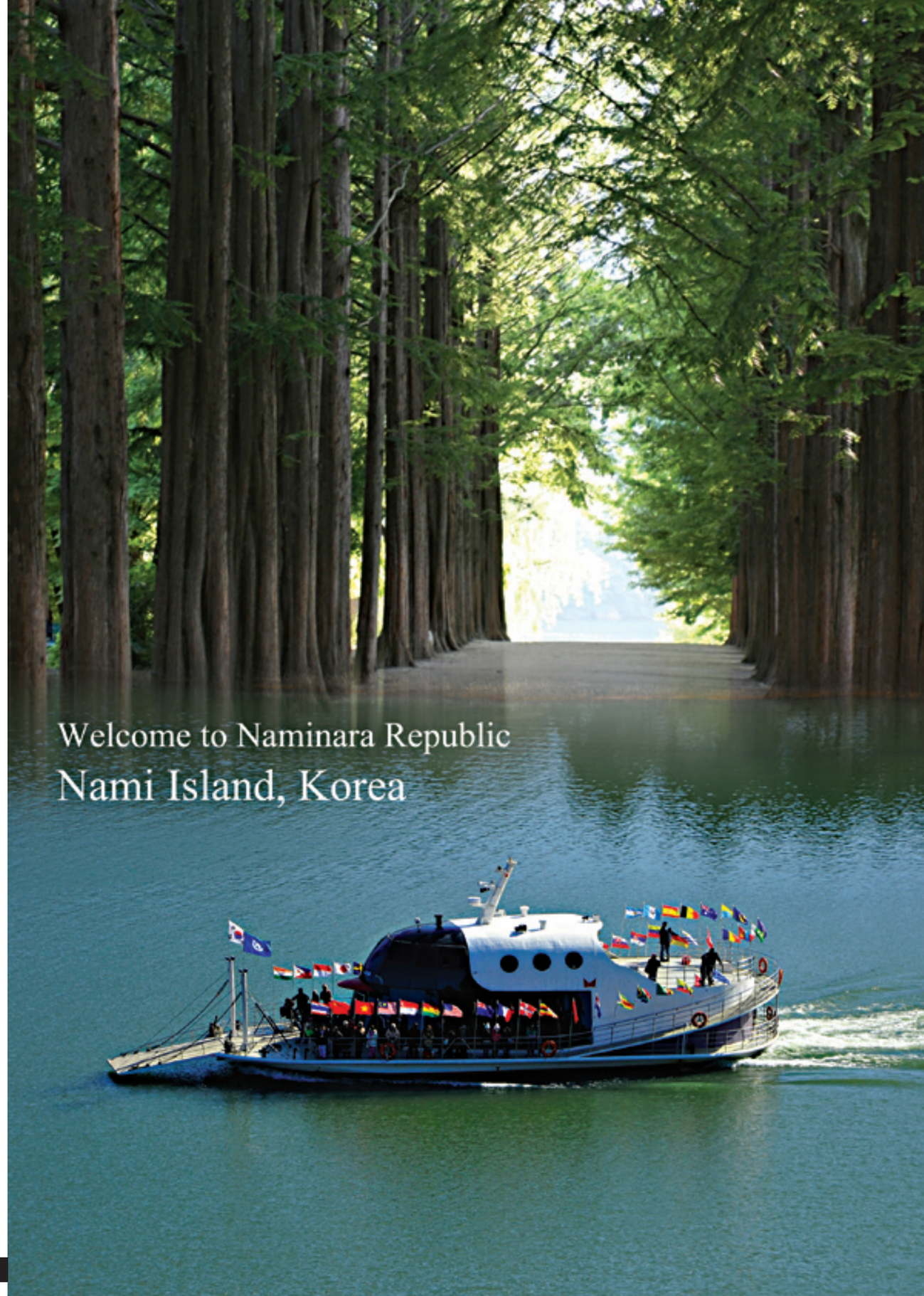

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