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Knowledge based production – future of Mongolia

Why do we pay such attention to business arrangements related to projects such as livestock production and mining natural resources? Why do we focus our efforts on those activities ultimately resulting in the destruction of natural resources, as well as becoming a source for extended property and rights disputes, while in reality only producing a few thousand tons of cashmere and wool? Shouldn't we consider the potential our natural resources, "immeasurable as an ocean," will someday be exhausted? Given the capabilities of Mongolian people, isn't there a window of opportunity for our country to further develop and nurture growth of industries, which will exploit our intellectual capabilities, rather than our resources?

I write this paper with the thought Mongolia can better envision prosperity through development of our people. We approach our prosperity through education, through investment in promotion of knowledge, through expansion of educational opportunities, through support of creative business models – investing in the intelligence of Mongolians, while encouraging hope and opportunity for our youth. We model Mongolia's future on the foundation of a permanent, services–based economy, rather prioritizing a nomadic economy based on physical labor.

The "Information Society" is driven by global network (Internet) and a rapidly expanding global economy. Countries throughout the world recognize the impact this global network of capability is having on basic social, political, economic, and academic factors impacting government policy guiding national priority and growth. However we, the Mongolian people, continue to use an image of poverty and natural disaster as our means of publicizing need for international assistance projects to recover national budget deficits. Mongolia will never grow as a nation if our international image is one of helplessness and despair, rather than a nation of intelligent, capable, and aggressive members of the global network-enabled information society.

Ireland, considered underdeveloped and poor among the highly developed countries in Europe in the 1990s, has become a leading exporting country in software development, which has had significant influence in restoring their economy. Today, Ireland supplies 65 percent of exported software in the European market. This statistic is enlightening.

Now, I would like to clarify what I am writing. The transition from an industrialized society to information society provides a new opportunity and atmosphere for the global economy. Although demand has increased sharply in the global market, supply which lags behind, continues to create deficiencies. As a result, import of information technology based jobs and services have increased, and developing markets of software and e-Services production opens a wide range of opportunities. There is a lack of knowledge-based production, e-jobs and services in developed countries.

The USA, which lacks adequate information technology experts, is considering additional issue of more than 200 thousand 'H1B visas' for highly qualified foreign personnel, in particular, information technology experts. One who has been accepted would be able to be employed up to 7 years in the field of information technology with the same status as a US citizen. In addition,

Germany, considered strict with acceptance in of foreign labor, announced decision to issue 20 thousand working permits or visas starting from April 2000 for information technology experts to live and work up to 5 years in the country. Given the example of these two powerful economies, and the intellectual deficiencies driving their immigration and work policy, you can see how acute this "window of opportunity" is for countries such as Ireland and Mongolia.

Gartner Group's analysis indicates India, Ireland and the Philippines are leader in promoting production in software outsourcing and cross-border eServices. This industry is clearly having a positive impact in developing their economies. In addition, also responding to this demand and developing a services industry capability are countries such as Egypt, Malaysia, Hungary and Check and Bulgaria. India has more than 500 companies, which compete in the world market. Only 20 of these companies make up 60 percent of gross revenues totaling nearly one billion USD. More than 60 thousand information technology personnel enter the workforce annually, with 25 percent trained to specialize in software. The Government is enacting policies to nurture and promote these activities, issuing legislation that ensures and facilitates simple operation of these activities, providing tangible assistance such tax relief, exemption from import duties, and establishing export-oriented science and technology parks. India is a country facing problems related to infrastructure, specifically electricity, communications and transportation. In the global economy English is the de-facto language. India has the advantage of being an English speaking nation, with English being used for all official business.

Ireland holds the second pace position, following the USA, in software production, with a total annual market of nearly 5 billion USD. There are nearly 15 thousand workers employed in software production, with the largest output in Europe's software market. Within Europe, Ireland exports nearly 600 million USD each year. There are nearly 400 software development companies operating within Ireland, including 100 multinationals. An additional 50 companies are dedicated to other areas of information technology. Of particular interest is the fact most Irish technology and software development companies have less than 150 employees. Most employees are multilingual, increasing their value and ability to support international business. Irish salaries are much higher than salaries for similar workers in India and the Philippines, which may ultimately work against them, eroding their market share in software and IT services. This is due to lower operating and development costs consumer will find in those emerging technology support countries.

The demographics of the Philippines software industry are slightly different, with more than 3000 companies operating, with an average of less than 50 workers per company, with a national total of in the range of 20~30 thousand software professionals. In addition, nearly 10 thousand Philippines are employed abroad. Although approximately 17 thousand students graduate with degrees in information technology each year, the Philippines do suffer from a deficiency in skilled project and program managers. Generally education levels in the Philippines exceed those in India (while lower than in the USA), with English used a both a native language, as well as an official government and business language. University level education is conducted entirely within English language.

Both Canada and Mexico have numerous advantages, such as a high profile in software market production and performance, as well as proximity in language and geography to the USA. In the

case of Canada, domestic demand is high enough to consume most software produced, limiting Canada's potential to compete in international software and IT services outsourcing market.

China continues to make rapid progress in information technology. There is prediction that China will catch Japan in the number of computers sold, although actual numbers of diffusion into social and business communities is low. While there is a very rapidly growing software development capability in China, at least for the near term most labor will be dedicated to domestic demand. Experts believe within the next few years China's information technology market may exceed 6.4 billion USD, of which 3.4 billion USD is software production. According to the same experts and analysts, the size of China's information technology market could exceed that of the USA.

So what do we do with this knowledge? Let's consider how to make use of this window of opportunity, which could be a "golden moment" coming potentially once in several centuries. Let's consider whether the potential of Mongolia participating and contributing to the global economy through our intellectual capability is an avenue for Mongolians to strengthen the economy and help rid ourselves of poverty suffered through lack of career and economic opportunity.

Some people may argue Mongolia's opportunity due to issues such as limited resources, insufficient expertise in information technology, remote location, and small population.

What discriminates information technology and software development from other traditional industries is that fact geographic location has no effect on a company's ability to deliver software solutions. Infrastructure is primarily based on Internet access, human intellectual ability, and industry knowledge. The physical network infrastructure required participating in cross-border e-Services outsourcing is already in place in Mongolia, and intellectual capability ready for development. Internet has been available since 1994, putting Mongolia ahead of other adjacent countries, including China. While initially there was one private Internet company, which strived to promote and develop network-based business, today there are 6 internet service providers operating, with a large number of institutions launching Internet-based operations. Public and private knowledge of electronic mail, and the enabling characteristics of electronic mail, continues to increase. Technical qualification and atmosphere for specialists in Ulaanbaatar are similar to those in India or Germany. Experience and knowledge of personnel is a separate issue, but not too complex to handle.

While email and website access is fairly well understood, ability to further exploit potential applications and services available through network-based interconnection is still abstract to many Mongolian managers and educators. So how do we address this problem? Let's consider the proverb "Magpies in harmony can catch a deer." This proverb reminds us of the power of collaboration and teamwork. Given this, it is time Mongolians begin to collaborate in the common goal of promoting our intellectual capabilities. As an industry and nation we need to think and collaborate under a common objective, integrating policies and activities of institutions at all levels to achieve our common goal, which is to participate in the global information economy. Our collaboration must being together government, scholars, business leaders in private enterprise focusing on development of information technology, universities, as well as support of network-based education inherent to primary and secondary education. Business

leaders must play an important role in this effort, as business support and leadership will ultimately be the key success factor in Mongolia's future as a participant in cross-border e-Services outsourcing.

If Mongolia devotes adequate resources and effort to construction of a "Millennium Information Road," instead of the "Millennium Road," we could potentially at a small fraction of the cost needed to build a Millennium Road. We need to exploit our available human resources to strengthen our economy and raise our quality of life, rather than continue to promote Mongolia as a beggar nation competing for international grants and funding. With economic strength, Mongolia can better fund projects such as the Millennium Road through our own successes and internal revenues, rather than through advertising our nation as an idle society, awaiting non-governmental organization handouts.

Mongolians are very perceptive, and able to copy and build on other's ideas. Let's look at an example… fast-service shops. Once the first fast-service shop was established in Ulaanbaatar, other entrepreneurs quickly copied this great idea, and as a result there is a collection of service "barns" behind each block and behind bus stops!

If we directed this type energy in a common direction, given the global characteristics of Internet access, there is very little outsourcing work we couldn't do, and no place on the Internet connected earth we couldn't reach. To meet this goal we should once again consider the idea of collaboration. Professionals (considering the need for local competition and business objectives), should consider ways to work together in a common industry objective, setting aside simple levels of market share and high level intellectual property concerns. Using another proverb, we need to "prepare our ladle so we can mix and prepare, rather than simply dip a spoon into the pot for a quick mouthful of food/brew." The following analysis clearly indicates how we need to think in attaining our objectives.

According to NASSCOM, the market for offshore, outsourced software consumed within the USA market amounts to about 100 million annually. This market is anticipated to increase each year by an additional 30 percent. In just the case of India, there is nearly 1.1 billion USD exported to the USA, with annual increases of nearly 50 percent. Dataquest analysis indicates the amount of offshore outsourcing in information technology will reach 143,7 billion USD, increasing annually by 23 percent.

To compete in the global cross-border e-Services industry needs a workforce meeting high standards. Planning needed to ensure a workforce able to participate in this field requires more than opinions by scholars and software developers – it requires a broad appreciation of the characteristics of both software and IT industries. Thus, while the academic community may have strong opinions on how best to prepare a graduating class to enter the workforce, national policy must also secure participation by strong project managers and use sound management skills to best understand the specific opportunities and requirements of this industry.

Knowledge-based jobs and services include all types of jobs, such as typist, operator and translator, which are facilitated by computers and Internet. Knowledge workers may include those involved in e-jobs and services, production of software, and exports of labor force (but not physical labor force!).

All participants in our community should consider what could be done to nurture success in network-facilitated electronic commerce services through productive discussions and arguments. Here are a number of thoughts to stimulate discussion:

1. Enterprises operating and investing to launch a business in the field of information technology should be exempted from taxes for 3 years. They should be re-exempted from taxes during the following 2 years, provided that they began to export their products and services.

2. Activities such importation, supply and trade of all types of computers, equipment and their spare parts should be exempted from taxes.

3. Soft loans from various foundations (for instance, 'poverty alleviation foundation') should be given to those, which have decided to create jobs locally.

4. Portions of foreign aid and loans should be devoted to establishing schools or colleges providing training in information technology, student exchange programs, training of teachers, and publication/translation of textbooks and manuals.

5. Sufficient computer access should be provided in each classroom, in all soums (sub-provinces) of Mongolia, so all students (including primary schools) will have exposure to network-based communication and education by 2003. Consideration of electricity capacity in soums must take into account potential alternate electric generation such as solar energy, wind, and diesel generation.

6. Establish Internet access centers in all aimag (province) centers. State-owned communication lines could be provided at a discounted rates or fees to promote access center operations. Consider possibility of using idle periods of TV broadcast channels, currently unused, for Internet transmission support. It proven use of television broadcast capacity is technically possible, and feasible.

7. Promote campaigns to retrain personnel currently employed in this information technology related jobs for the coming 2-3 years (issues concerning what area, whom and how to retrain could be determined by coordinated planning with funding agencies). Training programs could be funded by donor organizations, or designation of funds, which are currently disbursed for various meetings and workshops.

8. A technology innovation and incubation center ('Oyun Dalai' which means 'Ocean of Knowledge') ('Uhaalag Tuv', which means 'Wisdom Center', etc.) should be built. This center would be professionally furnished, in modern style, open to those Mongolian and international intending to promote Mongolian information technology and high technology development. Special consideration, administrative support, and favorable

support from government agencies should be given to those companies planning to take risk, innovation, and further develop Mongolia's capabilities in the international services industry.

9. Competent Mongolian companies should aggressively support onshore information technology outsourcing. I can assure you that we have such capacity and potential to support Mongolian and international companies based in Ulaanbaatar with our available corps of information technology professionals. The appeal 'for promotion of domestic production' should also apply to the field of information technology. If more domestic companies can outsource some or all of their information technology needs to a local IT consultant or outsourcing professional, then those companies will be able to dedicate a higher percentage of their capital and operational budgets to core competency activities (such as textile production, banking, assembly and manufacturing).

The above proposals are primary considerations. The following conditions should be met in order to benefit from economic progress based on information technology.

1. Our education system should focus on ensuring all graduating secondary and university level students are able to function within IT related roles – regardless of their academic major. Our education system must produce graduates capable of functioning in as global, information society/economy. Of those graduates entering the workforce, a much higher percentage must have broad skills in information technology, mathematics, computer science, and electrical engineering.
2. According to the analysis we conducted in the year 2000, some 600 out of more than 1200 workers in enterprises and companies in our country, which operate in the field of information technology, are employed in software. We predict 6000 specialists could be trained for 3-5 years if the above reserves of personnel were specialized in areas related to communications, information technology, and software development. We do not have specific information on the anticipated number of graduates available.
3. Training centers could be built to assist in training and instruction that would allow IT professional specific skills development, allowing some degree of specialization within the engineering and software community. Mongolia should consider cooperation or agreements with international companies offering certification and specialized skills development.
4. Today, there are not sufficient people who majored in management, are well aware of activities in this field, are at a level of conveyer production, excluding a few directors who manage companies operating in this field. This issue could be resolved by inviting management consulting experts (However, they should be selected by Mongolian management professionals. We don't need additional demographic and program analysis, we have already conducted many such projects) to conduct training for managers, by assigning foreign or returnee Mongolian business professionals as mentors for local managers. assigning. Cooperation should be promoted by establishing a team composed of those leading in information technology. A center 'Setgeh Huch,' which means 'Strength of Thought.'

In addition, national managers should be involved in specialized professional training, to include business process integration, application integration modeling, and ultimately promote development of a network-based business-to-business economy.

5. Appropriate evaluation
6. We should evaluate business models and activities in Ireland, India, and other similar countries that could be used in Mongolia, allowing us to participate in global markets.
7. Determine methods to enter foreign markets
   Several companies have taken tangible steps in this direction. Our experts noted reserves of personnel were not sufficient when there was a requirement to increase outsourcing production, though Mongolian technicians proved themselves capable to perform offshore outsourcing jobs and services. Therefore, it is important to cooperate in attracting foreign investment and training specialists to ensure we are competitive, while researching the possibility of entering international markets.

8. Preparation of standards compliance and accreditation
   To ensure Mongolian credibility, consideration to promote international business standards, such as ISO 900x and SEI CMM should be given by the government. Additional tax incentive for those companies meeting certification may be one method of stimulating accreditation, as well as additional consideration for government grants and training incentives.

   I would like to end my comments here as there is a multitude of ideas and suggestions in my mind to write down.

There is an enormous amount of work. Time would not wait us. What we do need is forward-looking harmonious collaboration.

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Ulaanbaatar, Mongolia