Connected Life

The next five years in Asia

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Foreword

Asia is witnessing a significant technological shift with the proliferation of connected mobile devices. With the growing affordability of mobile devices and the widespread roll-out of 3G and 4G technologies, it is only natural that a Connected Life enabled by machine-to-machine technologies (M2M) is the next big frontier of growth and innovation.

We believe that the pervasive nature of the Connected Life will have far-reaching socio-economic impact, often leapfrogging old approaches. In this report, we have tried to explore four such high-impact 'mXtensions' that could positively benefit China, India, Japan and South Korea over the next five years.

We have explored trends and needs emerging from these countries and how mobile technologies can help address them. The overall theme that emerged was that in a continent that holds the majority of the world's population, these technologies have a direct and positive impact on human wellbeing. Whether it is reducing the cost of elderly care or education, easing traffic congestion, or preventing power theft, mobile technologies are helping us move towards a better, more humane and efficient society.

The GSMA and various stakeholders around the world have provided valuable inputs for this report. A number of additional data sources and subject matter experts were consulted too. We aim to generate a dialogue among policy-makers within the government, civil society, corporations and individuals on the implications and possibilities of the Connected Life.

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Executive Summary – The Impact of the Connected Life

Asia to be the most connected region by 2020.

"The mobile industry continues to develop at an unprecedented pace and nowhere is this more evident than in Asia, a region that continues to experience tremendous growth and by 2020 will lead the connected devices and M2M market, both in terms of the number of devices and in terms of revenues," according to Michael O'Hara, Chief Marketing Officer, GSMA.

In Asia, this wave of mobile growth will enable key socio-economic advancements. By 2017, mobile has the power to:

Add up to $22 billion in economic productivity in China by reducing traffic congestion

- The introduction of mobile vehicle telematics could significantly reduce traffic by reporting critical data such as location, driving speed and direction headed and help Chinese commuters reclaim nearly two hours each of their time every week.
- Time saved by reducing traffic will help add as much as $22 billion of economic productivity.
- Reducing congestion is a key challenge with 106 million people in the ten biggest cities in China expected to spend over 80 minutes commuting per day.

Help power 10 million homes in India by cutting power theft and improving efficiency

- Installing smart meters in India could save enough electricity to power more than 10 million homes by 2017.
- India loses 24% of the electricity it generates every year, costing the country $17 billion – and power theft accounts for around half of these losses.
- Mobile enabled smart meters provide the wireless connectivity that allows utilities to detect and record theft as well as helping users optimize their consumption.

Save $10 billion in healthcare costs in Japan through mHealth

- The adoption of mobile technologies for remote monitoring, disease management, and preventive medicine for the elderly could reduce Japan's healthcare spend by $10 billion in 2017.
- By 2017, almost 28% of the Japanese population is expected to be over 65 years old.
- mHealth services for the elderly could result in sufficient savings to cover the medical expenses of one million senior citizens each year.

Reduce education costs for students in South Korea by up to $12,000

- Technology-enhanced learning, including a major contribution from mobile, could save South Korean families between $8,000 to $12,000 over their children's school lives by complementing traditional after school private classes.
- In 2012, South Korean parents spent around $17.5 billion, or 1.5% of GDP, on private after-school education
- Replacing private English and Mathematics classes with technology-enhanced learning for the equivalent of two days of tuition sessions a week could help South Korean students and their families save enough to cover half the cost of their higher education tuition.

"Beyond connectivity, mobile operators will play a crucial role in working together with a range of industry partners in health, automotive, education, smart cities and a range of vertical industries to accelerate the launch of valuable connected services," says Ana Tavares Lattibeaudiere, Head of Connected Living, GSMA.

Asia: The difference the Connected Life could make in five years

China

2 hours a week for every commuter

Time saved commuting by reducing traffic congestion

India

Power to 10 million homes

47 billion kilowatt-hours saved by reducing power theft and improving usage efficiency

Japan

10 billion USD saved annually

Equivalent to the healthcare costs of a million senior citizens

South Korea

8,000 to 12,000 USD

Potential savings in after-school private education over a student's lifetime

Traffic telematics could help Chinese commuters reclaim nearly two hours each of their time every week

Estimates indicate the economic benefits of the resulting increase in productivity could add over 20 billion USD to the Chinese GDP each year.

Chapter 1
China

The number of cars in China may surpass 200 million by 2020

China's strong economic development over the last decade and its burgeoning middle class has created a very high demand for automobiles, unlike any other country in the world. The Chinese automotive market is now the biggest in the world. According to the Ministry of Public Security, car ownership had reached 120 million in 2012.

The growth in infrastructure will struggle to keep up with urban migration and the growth in consumer wealth. Even though China has developed 639,000 km of new roads in the past five years, the infrastructure is still struggling to contain the surge in traffic or *'jiāo tōng du sai'*. An example of this is the 'China National Highway 110' traffic jam that occurred in 2010. This traffic jam spanned over a 100 kilometres, lasted over 10 days and is considered to be the longest traffic jam in history. This was a highway where traffic had increased by 40% every year, while the roads themselves could only be widened to a limited extent.

Today, the average urban commute (both to and from work) in the biggest Chinese cities is already in the range of 80 minutes a day. The OECD estimates that between now and 2030, an additional 300 million rural Chinese will migrate to the cities, thereby exacerbating the demand on infrastructure. The Chinese government has taken this to be a serious challenge stating that it will support the development of eco-friendly urban transport networks, offering a wide range of tax breaks and fuel subsidies for mass transit.

Vehicle telematics could help address traffic congestion in Chinese cities

It is estimated that between 20% and 25% of commute time in China is spent in delays simply due to traffic jams. According to a 2009 study by the China-based Horizon Research Consultancy Group, in cities such as Beijing, the economic losses per person due to traffic congestion was in the range of 54 USD a month. The results of another study released by IBM in 2011 indicate that over 85% of respondents in Beijing and Shenzhen stated that traffic was a key inhibitor to work or school performance. These are cities where the Chinese government is investing heavily in infrastructure to ease commuter burden. This enhancement of infrastructure requires the infusion of additional intelligence such as telematics and smart traffic management to maximise benefits to commuters.

The introduction of vehicle telematics could reduce traffic congestion and related economic losses by enabling every vehicle to function as a traffic probe and anonymously report critical data such as location, driving speed and direction headed. Technologies such as big data analytics and cloud computing will enable the aggregation of this data and offer real-time, as well as predictive, traffic solutions. These intelligent navigation systems will go

beyond conventional GPS systems in that they will constantly make adjustments to driver routes by judging real-time conditions at all points of the route. We estimate that the implementation of vehicle telematics in the 10 largest Chinese cities could potentially save drivers up to 20 minutes a day[1]. When we consider the fact that these cities house over 76 million people of working age, the amount of productive hours reclaimed could translate to economic gains of around 22 billion USD by 2017[2].

Roll-outs of successful vehicle telematics pilots are already taking place across the globe

Within China, global auto players such as BMW, Ford, GM, and Toyota are already offering vehicle telematics services. Most local manufacturers are expected to launch such services in the near future as well. Additionally, there are a wide range of third party players entering this space to provide telematics add-ons to existing car owners.

Cisco estimates that vehicle telematics can reduce time wasted in traffic congestion by 7.5% and lower costs for vehicle fuel, repairs and insurance by 4%. A 2012 study conducted by MIT, Central South University in China, the University of California at Berkeley and the Austrian Institute of Technology demonstrated that cancelling the trips of a select 1% of drivers from specific neighbourhoods based on data gathered from mobile phones can reduce travel times for other drivers by as much as 18%.

A number of European telematics pilots already indicate the potential that can be achieved in China:

• Turin (Italy): 20% reduction in travel time for private cars and 19% reduction for public transport.

• Paris (France): A prediction tool using vehicle telematics provided 94% accurate urban traffic forecasts.

• Helsinki (Finland), Gothenburg (Sweden), Scotland (UK), Eurodelta (Netherlands), Paris and Ile de France (France) and Bavaria (Germany): 70% of test users were satisfied with vehicle telematics devices which helped them with travel and traffic information enabling easy access to information and improved decision-making.

1. The overall impact on commute times has been calculated by considering the impact of connected cars in the city. The impact of strategic reduction of drivers from critical neighborhoods and benefits achieved from carpooling, etc is expected to reduce commute times via public transit proportionally. Estimates indicate that the overall impact of commute time reduction can range from 25%-33% in 2017.

2. Economic gains estimates have been adjusted downwards with an adjustment factor of 20 -25% per city to account for commuters using railway and transit networks. Estimates do not include savings in fuel consumption and maintenance costs.

mAutomotive in China

China is the largest automotive market in the world

13 mn
cars on the road

13.6 mn
cars sold in one year

120 mn cars
on the road today

165 mn
cars expected

2003 — 2009 — 2012 — 2017

718 mn
people live in urban centres today

+

87 mn
rural people are expected to migrate to urban centers

=

805 mn
urban residents by 2017

The 10 largest Chinese cities...

Beijing
Shenyang
Tianjin
Taiyuan
Nanjing
Shanghai
Hangzhou
Chongqing
Guangzhou
Shenzen

107 mn
people will live in the ten largest cities

Over 80 minutes a day
will be spent commuting per person

In 15.5 mn
Privately owned cars

mAutomotive will help each commuter save...

through reduced commute time

2 hours weekly

x 76 mn commuters

=

22 bn $
addition to annual economic productivity

Chapter 2
India

Reducing power theft and increasing usage efficiency via mobile enabled smart meters could save enough electricity in India to power more than 10 million homes.

Power theft alone contributes to over half of India's electricity losses and costs the nation between 8 billion to 9 billion USD every year. Mobile enabled smart meters are expected to be the most critical element in bringing down these losses over the next five years.

India's transmission and distribution losses are among the highest in the world at 24%. The majority of these can be directly attributed to power theft

The rapid growth of the Indian economy has created a surge in demand for electricity that cannot be met by the existing power situation. As recently as 2011, 15% of those with access to electricity were still suffering power outages regularly. This supply-demand disparity is likely to worsen, considering that while the GDP grew at an average of 8% over the last five years, annual capacity addition of power was only around 6.8%.

The magnitude of stress that this puts on existing power infrastructure can be seen from the fact that in July 2012, India's blackout was the largest power outage in history and affected over 620 million people (nearly a tenth of the world's population), spreading across 22 states.

According to the Ministry of Power, India's Transmission and Distribution losses stand at 24% and it is estimated that these losses cost the country over 17 billion USD every year (i.e.) 1.5% of India's GDP. Fortunately, technical losses within transmission and distribution only represent a third of the total power losses across India. The remaining two thirds of the losses, a majority of which is power theft, can be reduced without major infrastructure changes.

Mobile enabled smart meters can help reduce power theft without overhauling existing infrastructure

The theft of power or *'kundi'* as it is called in some parts of the county is an unfortunate practice which is so common that even police officials have been caught stealing power for personal purposes. While power theft can occur in many ways, such as via the tapping of power lines, tampering or slowing down of meters, or bribery, the common element continues to remain human.

Mobile enabled smart meters dissuade consumers from stealing power by letting them know that the utility has the tools to detect and record theft. In conjunction with analytics tools, unusual activity such as meter bypassing or the tapping of live wires can be easily tracked as mobile enabled smart meters provide them with widespread real-time visibility of consumption and distribution points. Mobile enabled smart meters are highly tamper-resistant as they are able to alert utility providers almost instantaneously during unauthorised access. Additionally, their built-in mobile connectivity allows them to circumvent the need for meter reading staff and therefore eliminates issues such as bribery and intimidation.
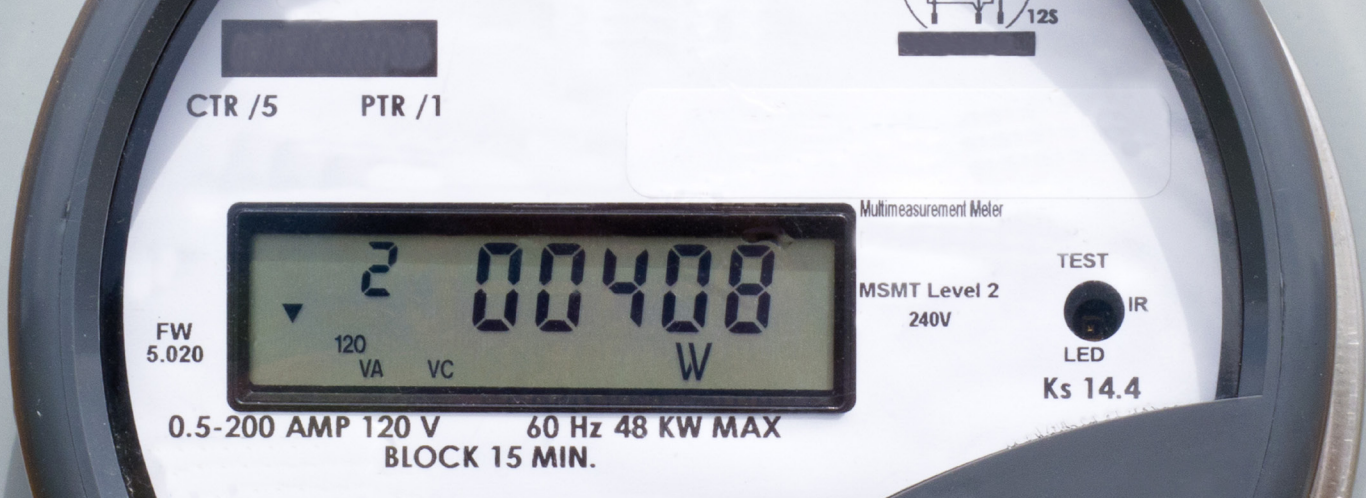
Mobile enabled smart meters are cheap and easy to install as independent modules that sit atop existing meters. Besides helping utilities reduce power theft, they help consumers optimise their usage by providing regular updates on their energy consumption patterns and associated costs. The Indian government plans to deploy smart meters for all new connections by 2017. Based on the government's stated objectives and expected rollout, we estimate that all these smart meters would be mobile enabled and could save upto 4.5%[3] of total electricity consumed by reducing power theft as well as consumption.

The government as well as private players are pushing for the adoption of mobile enabled smart meters

- In May 2010, the Ministry of Power launched the 'India Smart Grid Forum' roadmap outlining the roll-out of a smart grid throughout the country. It shortlisted 14 pilot smart grid projects that will cover close to 300,000 high usage, industrial and residential customers who account for 2% of the total energy consumption in the country. The key focus areas of the project include the reduction of both technical as well power theft related losses.

- The Restructured Accelerated Power Development and Reforms Programme (R-APDRP) was launched by the Indian government with the objective of reducing network losses to 15% (a number that requires at least halving power theft). Bharti Airtel, an Indian telecom service provider, is implementing mobile enabled smart meters across three Indian states using M2M technology in partnership with the R-APDRP programme.

- The North Delhi Power Ltd (NDPL) in partnership with GE has initiated a pilot project involving the installation of mobile enabled smart meters in 500 households across selected areas in Delhi. The aim is to help the utility provider reduce power outages and increase reliability.

3. The year 2017's supply and demand estimates have been calculated based on the following assumptions: The state-wise per capita electricity consumption is expected to grow based on published government estimates. The components of T&D losses will remain constant and the actual losses will reduce for all states and union territories in accordance with the Planning Commission's estimates over the next five years. Average household size of each of the states will not change considerably over the next five years.

Mobile enabled smart meters in India

24%
of electricity is lost every year

→
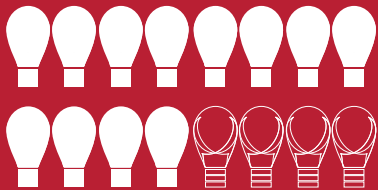
17 bn USD
is the economic cost of these losses

$$$$
$$$$

→

1/2
of these losses are due to power theft

How does power theft happen?

Directly tapping power lines

Meter tampering

kancncd
1 2 3

Bribery

Mobile enabled smart maters can reduce power theft and improve energy efficiency

- Tamper-resistant
- Real time visibility for utilities
- Consumer education on usage habits
- No need for meter reading staff

10 mn
Indian households can be powered from mobile enabled smart meter energy savings in 2017

Jammu & Kashmir
110,000

Punjab
410,675

Himachal Pradesh
22,500

Uttarakhand
31,000

Sikkim
1,700

Arunachal Pradesh
4,100

Meghalaya
13,100

Haryana
385,000

Delhi
164,000

Rajasthan
358,800

Uttar Pradesh
1,500,000

Bihar
720,000

Nagaland
16,600

Manipur
15,000

Jharkhand
94,000

Mizoram
2,800

Madhya Pradesh
745,000

Chattisgarh
41,500

Odisha
175,200

West Bengal
436,00

Tripura
6,800

Maharashtra
1,057,000

Andhra Pradesh
900,000

Andaman & Nicobar
4,000

Goa
20,850

Lakshwadeep
500

Karnataka
500,00

Tamil Nadu
845,000

Kerala
231,000

Note : Numbers indicate households per state

Adoption of mHealth for elderly care in Japan could result in savings equivalent to the medical expenses of 1 million senior citizens each year

The use of mobile technologies for remote monitoring, disease management, and preventive medicine for the elderly could reduce Japan's healthcare spend by 10 billion USD in 2017

Chapter 3

Japan

By 2017, almost 28% of the Japanese population is expected to be over 65 years old

According to Statistics Japan, the number of people aged 65 and above increased from 25.6 million in 2005 to nearly 29.8 million in 2011. By 2025, nearly one in three Japanese will be over the age of 65.

Two reasons for this rapid shift in demographics, referred to locally as 'kōreikashakai', are that fertility rates are at a record low and life expectancy of the Japanese population (men: 79 years, women: 84.2) is one of the highest in the world.

Despite the Japanese elderly being among the healthiest in the world, they still pose serious challenges to sustainable Japanese healthcare, with over half of Japan's annual healthcare spend of 540 billion USD being allocated to the elderly. This number is expected to increase by around 4 to 5% each year.

The frequency and duration of hospital visits accounts for these high costs. The average length of stay for inpatient care is 32 days (two to three times that of patients in other developed countries) and this rises sharply to around 45 days in case of senior citizens. Additionally, the average Japanese person visits a physician between 13 to 14 times a year and this rises considerably for seniors. As a result, healthcare expenses for people over the age of 75 typically tend to be 4.6 times more than their younger counterparts.

Remote patient management could be a cost-effective alternative for ageing patients to manage chronic conditions while staying at home

Inpatient and outpatient costs account for 77% of total healthcare spend in Japan, with chronic conditions accounting for 80% of fatalities. According to the Japanese Ministry of Health, Labour and Welfare, elderly patients accounted for 46% of outpatients and 68% of inpatients in 2010. Additionally, the average length of each stay for long-term care patients is nearly 176 nights.

mHealth can play a significant role in relieving the strain on Japanese healthcare as it provides a unique set of benefits. mHealth based services such as remote patient monitoring and management can reduce the need and duration of hospital stays post medical procedures. Mobile enabled disease management tools are relatively simple to implement and are particularly effective in treating long-term conditions as they tend to help improve adherence and self-evaluation. This is especially relevant in the case of the elderly population where chronic conditions tend to be easy to recognise, track and treat, given good patient adherence.

Besides the obvious benefits, mHealth has notable applications in optimising the storage and recovery of medical records and can help reduce administrative costs as well as processing times. With continuous monitoring and early diagnosis, mHealth could reduce re-admission rates substantially. Even with an adoption rate of only 20% by 2017, savings enabled by mHealth could be as much as 10 billion USD per annum[4], sufficient to cover the cost of treating 1 million senior citizens each year.

A range of studies and pilots support the benefits of mHealth

- One of the most widely cited studies on mHealth by Meyers, Kobb and Ryan reports that an adoption of technology enabled remote care can lead to a 40% reduction in emergency room visits, a 63% reduction in hospital admissions and a 60% reduction in hospital bed days of care.

- Since 2012, NTT Docomo and Omron Healthcare have teamed up to provide wireless access to various Omron devices. These include blood-pressure cuffs, sleep monitors and body composition scales that support remote health management. This follows NTT Docomo and Fujitsu's 2009 line of *'RakuRaku'* phones for seniors that worked with Omron medical devices.

- Qualcomm in partnership with Medical Platform Asia (MedPA), has provided 300 3G enabled medical devices as part of their Wireless Reach™ initiative to allow Japanese remote local residents to send critical health information to doctors through a 3G wireless network. These devices track information such as blood pressure, weight and distance walked and shares it with participating physicians.

- Scotland is witnessing a shift in its demographic that is similar to Japan where over 20% of the population now belongs to the senior citizen category. An evaluation of 32 pilots funded by the Telecare Development Plan (TDP) across Scotland reported savings of 17.8 million USD due to reduced admissions to care homes, a fall in unplanned admissions in hospitals, quicker discharges from hospital and fewer home check visits. Overall, it was found that the telecare service could generate elderly care savings of about 25%.

- A global study by the Telenor Group has indicated the potential of mHealth for reducing elderly care cost by 25%.

4. In order to arrive at the estimated impact of mHealth, we have made the following assumptions: The per capita spend on the elderly, as a ratio of the national average remains constant over the next five years,. The proportion of health care spends based on conditions and functions do not change considerably over the next five years. The reduction in healthcare costs based on pilots conducted in various OECD nations can be replicated in Japan. Strength of evidence of each pilot has been taken into consideration to scale down cost reduction estimates by a range of 25 to 50 %.

1 in every 3

Japanese will be over the age of 65 by 2025

$ $ x 4.6

On average, senior citizens spend almost 5 times as much money on healthcare as compared to their younger counterparts

51%

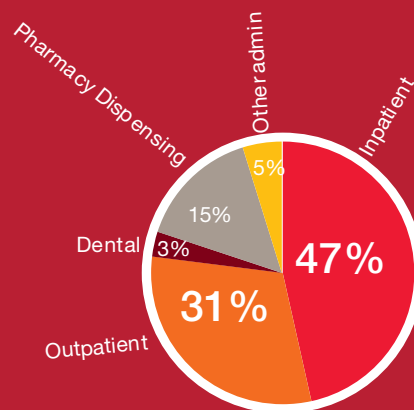**of Japanese healthcare is spent on senior citizens**
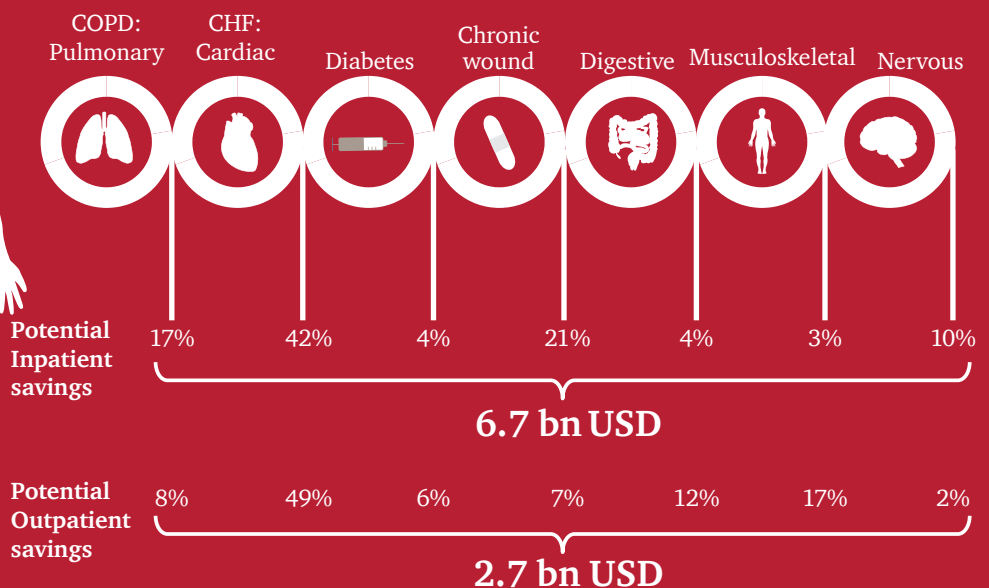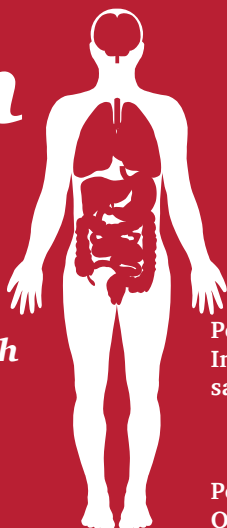
Average life expectancy

84.2 years

79 years

78%

of elderly care is spent on inpatient and outpatient care

Pharmacy Dispensing
Other admin
Inpatient
5%
15%
Dental 3%
47%
31%
Outpatient

10 bn USD

can be saved through mHealth for elderly care in 2017

	COPD: Pulmonary	CHF: Cardiac	Diabetes	Chronic wound	Digestive	Musculoskeletal	Nervous
Potential Inpatient savings	17%	42%	4%	21%	4%	3%	10%

6.7 bn USD

	COPD: Pulmonary	CHF: Cardiac	Diabetes	Chronic wound	Digestive	Musculoskeletal	Nervous
Potential Outpatient savings	8%	49%	6%	7%	12%	17%	2%

2.7 bn USD

Technology enhanced learning (including mobile) could save South Korean families between 8,000 to 12,000 USD on private tuition for their children.

The use of Technology enhanced learning (including mobile) to complement traditional after-school private classes could help Korean students save enough to cover half their university or higher education tuition.

Chapter 4
South Korea

According to Statistics Korea, South Korean parents spent around 17.5 billion USD or 1.5% of GDP, on private, after-school education in 2012

In a country known to produce among the best students in the world, and where education is viewed as being crucial for success, competition is fierce. Outside school hours, an overwhelming majority (around 70%) of children attend supplementary, private classes. These after-hours schools, known as 'hagwons', charge around 2,550 USD a year and can typically run for up to three to five hours a day, six days a week.

The average spend on education in South Korea can range from 9 to 17% of household income, often more than spend on basic necessities such as food and beverages (which account for around 12 to 13%). This high cost of education can have a knock-on effect. Today it is considered to be a major contributor to the steep drop in fertility rates in the country. The average number of births per woman in South Korea is about 1.2, so low that by 2050 nearly 45% of the population could be senior citizens. The government recognises this and has taken steps to offer after-school programmes, providing additional classes and extracurricular activities to students, and has set aside 1.5 billion USD to provide parents with free child care up to the age of five.

Technology enhanced learning could save these families between 8,000 to 12,000 USD on private tuition for each child

English and Mathematics are the two subjects on which parents spend the most, as much as 65% of total spend on private tuition. Annually, this amounts to around 1700 USD outside of regular school. Despite government initiatives, the demand for these classes appears to be increasing. Over the last five years, the cost of these classes has gone up at a rate above South Korea's average annual inflation which is less than 3% (an increase of over 3% for English and 6% for Mathematics, each year).

Our February 2013 report 'The impact of the Connected Life' over the next five years indicated that the adoption of technology enhanced learning (both online and via mobile) could reduce the cost of education by as much as 80%. In some cases, this number could be even higher when we include transportation related savings. South Korea is uniquely placed to promote mainstream digital learning amongst younger students considering that by 2012 nearly 90% of South Koreans between the age of 12 to 29 had smartphones. The usage of these smart phones is high with three out of five smartphone users spending more than two hours a day on these devices. Additionally, the penetration of tablets nearly doubled to touch 7.5% in just one year and this number is expected to grow steeply in the near future.

If students were able to replace two of the six days[5] they go for these extra classes with technology enhanced learning, they could save around 8,000 to 12,000 USD over their school lives[6]. The savings could be as high as 14,000 USD if students attend compulsory military service for 2 to 3 years before entering higher education[7]. South Korea has the third highest average university or higher education fees among OECD countries, with annual average tuition costing up to 7,000 USD. Savings from the adoption of technology-enhanced learning could halve this tuition burden.

Mobile initiatives are already being rolled out across the globe to provide access to technology-enhanced learning

- In 2011, South Korean (SK) Telecom launched the T Smart Learning Service which is a mobile education platform that offers interactive education and enables students to create a 'smart learning' environment. Additionally, the service allows downloading and sharing of educational content and lets parents track their children's academic performance.

- Indian operator, Bharti Airtel has launched the '3 Pack Education Portal', a mobile learning platform for its Indian customers. The Airtel 'Exam Preparation Service' helps students prepare for various entrance exams like the GMAT and GRE using mobile devices. Additionally, it also offers English learning and campus search tools for its subscribers.

- In 2009, Mobile Operator Turkcell launched the Mobil Egitim (Mobile Education) initiative which enables users to get podcasts or text-based education programmes via mobile tools.

- Nokia launched its Life Tools application in 2009 and used an interesting approach for distributing content related to agriculture, education, entertainment and healthcare. Individuals can obtain content either as a combined package (including the price of the device) or as a paid subscription. The application has over 48 million subscriptions today.

- Qualcomm's Wireless Reach™ initiative 'WE Learn' is empowering third-grade students at Nan Chiau Primary School in Singapore to use 3G-enabled smartphones to transform learning from a traditional, teacher-centric model to a student-centric, inquiry-oriented, collaborative model.

- According to the research firm, Ambient Insight, the global market for mobile learning products and services is expected to grow to 9.1 billion USD by 2015.

- The South Korean government is in the process of providing digital textbooks to all students by 2015 in order to help reduce the cost of textbooks and make traditional education more affordable.

5. Based on primary interviews and discussions with education experts and mEducation service providers.
6. Average savings have been estimated based on the 450 – 600 USD that students can save each year. The average length of schooling is 12 years. Total Savings have been estimated with a nominal interest rate of 4.5% a year.
7. For estimates in the case of compulsory military service, an additional 2 - 3 years have been added to account for the service period. Nominal interest of 4.5% has been used in this case.

17.5 bn USD around 1.5% of GDP is spent on private, after-school education

70% students go to private after-school classes

2,550 USD annual cost of these classes per student

67% around 1,550 USD is spent on English and Mathematics classes

3 hours additional time spent studying everyday when compared to their OECD counterparts

The average Korean student...

2nd rank in Pearson's Global Index of Cognitive Skills and Educational Attainment

93% of Korean parents want their children to enroll in higher education

1 hour students get less sleep daily compared to other developed countries

90% of South Koreans between 12 to 29 years own smartphones

7.5% 7.5% of them own tablets

60% users spend more than two hours a day on these devices

Technology-enhanced learning can help students save...

8000 to 12000 USD over their school lives

=

1 to 2 years of university or higher education costs

Methodology

Initial short listing of country-specific interventions and their key areas of impact

This research report aims to capture the socio-economic impact of Connected Life services in Japan, China, South Korea and India. As part of our research, we looked at the four services of the Connected Living programme: mHealth, mEducation, mAutomotive and SmartCities.

We shortlisted a series of potential country-specific interventions based on the following filters:

- Address key burning needs that affect the country on a large scale
- Have a measurable impact by 2017
- Have some degree of adoption in the existing market
- However for South Korea, we have not used adoption rate for population and estimated savings for each student

Based on our filtering criteria, we arrived at four interventions for the four countries.

Capturing data and developing impact models

We created a master pool of data to capture relevant data points for each of the four countries from the respective country statistics database (e.g. MHLW, CEA, Ministry of Power, Ministry of Education) and globally recognised knowledge sources (e.g. WHO, UN and World Bank). We then identified a series of case studies, research outcomes, and pilot programmes that have been able to arrive at quantifiable conclusions on the impact of each of the mobile interventions in the respective countries.

Based on the impact evidence, the respective country studies have been clustered (Japan: Disease type, India: State-wise energy losses) and organised to provide specific impact data metrics. Clusters with similar impact levels based on current conditions and mobile penetration levels are adjusted to similar impact levels. These clusters and the impact of these interventions were consolidated to arrive at the first set of conclusions. These conclusions were then tested by altering impact metrics to arrive at optimistic and pessimistic scenarios. Another series of tests conducted involved the introduction of error variables to determine the sensitivity of these models.

Arriving at projections

The models have been designed such that the impact of each intervention is estimated on existing projections of impact areas. For instance, in case of our SmartCities–India study, we used the Planning Commission report as the basis for analysing our impact on projected energy losses. Based on this impact, we have arrived at our conclusion for each of the four topics of research.

Master data	Need for mobile intervention	Microanalysis	Impact evidence	Scenario analysis	Output
Identifying relevant data points	Data analysis to establish reality	Identifying cluster criterion	Finalising case studies and impacts delivered	Parameters varied to identify various scenarios	Example: Power theft is a big challenge in India that can be reduced using mobile enabled smart meter technology, which can also help save enough electricity to power more than 10 million homes.
National statistics and global knowledge source	Places where possible mobile interventions can create a positive impact were identified.	Each country study first identifies the methodology of clustering and then impact evidences are staggered accordingly.	Identify relevant case studies and pilot programmes utilising mobile technologies for each relevant topic.	Develop impact parameters based on case studies and pilots. Develop the impact model and identify impact of outcomes.	

Methodology to identify socioeconomic impact for each Connected Life service covered

References

mHealth

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