



# **Future Moms Protection Network**

**A Comprehensive network connecting You and Future Generation**

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# Introduction

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**A** For women, giving birth is considered one of the most important moments in life. In China, around 20 million women become pregnant each year, and while most of them are excited about the coming child, they are also worrying about the prenatal care. China is a country with the greatest of inequalities in its medical care system, ranked by the World Health Organization. Although pregnant women have the priority in hospitals when they are about to give birth, the medical professionals are unable to provide them with enough assistance before the birth, due to insufficient information and scarce resources.



If advanced technology can build up a better communication channel between patients and doctors, hospitals will be able to make better clinical decisions based on wisely resource allocation, in the way to increase Medicare operation efficiency and maximize patients' benefits. Also, pregnant women won't feel lack of control in terms of their own health and care for their yet unborn babies.

## Business Concepts

**“F**uture Mom Protection Network” (FMPN) is a designated network to solve the dilemma that these pregnant women and medical institutions are facing daily. The network aims at better distribution of resources and eliminating deficit of accurate information. FMPN utilizes the current mobile phone technology, sensor dictation, database management and social networking applications all together, in order to build up the linkage among pregnant women and at the same time with medical doctors, who can provide professional assessment to their health. Furthermore, in cooperation with leading universities, the data can be utilized for further research that can help to overcome the current healthcare problems.

## Technology

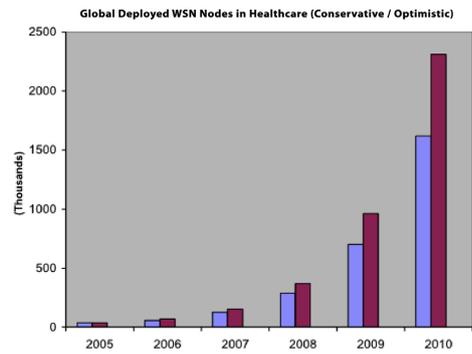
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**R**ecent technological advances in “sensors, lower power integrated circuits, and wireless communications” have enabled the design of new forms of communication networks and wireless sensors networks (WSN) (Milenkovic, Otto & Jovanov, 2009). WSN is a small embedded sensing platform with computing and communication capacities, which combines characteristics like low cost, flexibility and fast development (Bauge, 2009). According to technology life cycle, WSN is most likely to become the next information technology revolution after personal computer and Internet.

In addition to conventional network protocols like WiFi, Bluetooth, and IP, there are also new low cost and low power protocols, for example Zigbee, emerging, which have been adopted in Medicare. In 2007, Dr. Bahatia in the University of Texas at Dallas developed the well-functional wireless health monitor, which greatly reduced the cost of health monitoring (UTD, 2009) (Picture 3). In February 2010, Medical Journal Health Affairs published a study named “E-health Technologies show promise in developing countries”, which proves the social and commercial potential of WSN in developing countries, such as South Africa, Uganda and Asia, which both increase the efficiency of Medicare allocation and effectiveness in preventing patient loss (Blay, Fraser & Holt, 2010). Nevertheless, Thales Research and Technology in UK predict WSN research and development budget to rise to \$1.3 billion and the revenue to rise up to \$12 billion by 2013 (Bauge, 2009).

Although WSN technologies application in health care system has caught considerable amount of academic attention, whereas the majority of its usage is supposed to exist in healthcare centers rather than directly emphasize on consumers. With the increasing global WSN nodes, it becomes more technical possible to provide monitoring services directly to consumers, which provides more autonomy and options as all patients need. Therefore, we have enough confidence to believe in the future of WSN application in medical assistance.



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## China Analysis



The people's Republic of China (PRC), known as China, is located in East Asia, with 1.6 million square kilometers area and the world largest population of 1.5 billion people. Chinese government is run under a socialist economic and political system, which is mainly responsible for the country's macro-planning and maintaining long-term stability under high economic and political pressure. China also has the third largest economy after the U.S and Japan, with a nominal GDP of 4.4 trillion U.S dollar. Also, the Chinese economy is the fastest growing economy with average annual GDP growth rate of 10% in the past three decades of the economic reforms.

Thanks to a more liberalized economy, the Chinese technological infrastructure has grown significantly. China is also now the largest mobile phone market, with nearly 350 million users, while the number of Internet users is roughly 100 million and growing by 30% a year (Passport, 2010). The world largest mobile network in term of scale and consumer base, China Mobile has 538,887 million subscribers and the second large operator has 65.59 millions subscriptions. In addition to the common network technologies like GSM, GPRS and EDGE, Mobile 3G technology adopted by China's mobile network has expanded to 70 percent of China's cities and has obtained 3 million subscribers by the end of 2009 (Nystedt, 2009).

As the income level continues to increase, the Chinese population is becoming more and more concerned about their health. Chinese health policy greatly emphasizes on the active preventative treatment rather than passive curative medicine. However, due to the reality of lacking enough accessibility to hospitals for ordinary people, most Chinese are reluctant to visit hospitals on a regular basis, which leads to serious problems and delayed cure. China's current medical system is unable to satisfy the overwhelming demand from large population towards medical services.

Nevertheless, China's "one child" policy, initially introduced as birth control, reshapes the structure of Chinese society. This policy has great impact on restructures on family size, late marriage and childbearing, which also indirectly results in aging population, increasing financial burden on female, and other social problems.

In addition, China is a country with a 5000 year history and a Confucian philosophy tradition; thanks to this they have ancient health techniques and medicines, plus the imported ones from western world. China has given the world the Traditional Chinese Medicine (TCM) based on the theory of Yin and Yang, the belief that opposites balance each other (Crowther, 2009).

Finally, **the reasons** for choosing China as our first launching location are 1) Well-established infrastructure and previous existence of mobile network with a good coverage; 2) Increasing economic power and participation in international trade; 3) General favorable environment for for-

eign direct investment, especially encouraging high-tech projects, created by Chinese policy; 4) Potential for becoming world's largest market. 5) Chinese pregnant women are in need of medicare services.

## Market Analysis

China's birth rate consistently maintain the level between 1.29% to 1.4%, with annual increase around 0.02% to 0.03% in the year from 2003 to 2010 (IndexMundi, 2010). Although China has been effectively stabilized its birth rate, the number of expecting babies born in 2009 is still considerably large, around 19.6 millions. Therefore, the number for pregnant women in China is larger than 19.6 million in 2010. According to the population distribution map, majority of Chinese live in eastern side of the country, where will be expecting more new born babies each year. Because of the post-effect of one child policy, there will be only one time for most women to give births and they certainly lack of maternal experience.

Traditionally, women in prenatal stage have been given considerable amount of attention in terms of nutrition, workload and Medicare. Chinese government enforces the paid maternity leave for 90 days with 100%. According to tradition, women after-giving birth should stay in-door for at least one month. Thus, the maximum period of time a woman can request for maternity leave will be three months. In reality, with raising women power, there are 347 million working women, who represent 45.5 percent of the country's workforce. Often a time, these working women are concerned about their career and continue to work until it becomes physically impossible. Therefore, they are constantly under stress and they lack the time for regular Medicare and hospital visits.

Also, pregnant women whose age is over 35 years are considered as older moms. Old women often bear high health risk in declining fertility, hypertension, depression and maternal mortality. More and more women tend to seek a career and postpone motherhood, which can be indicated by the increasing number in older moms from 3 percent in 1980s to 7 percent in 2009. These women are certainly in need of comprehensive medicare, which can be both effective and time efficient.

In the current market, multinational medical device manufacturers such as GE Healthcare, Siemens and Philips have already obtained a 70 percent share of China's high-end medical device market. Yet these companies are increasingly eyeing the lower-end medical device market now that they see the Chinese government is increasing investment towards the upgrading of China's small and medium-sized hospitals as part of the ongoing health care reform. This will only point to sharper competition in the lower-end

medical device market in the days to come and China's 12,000 domestic medical device companies will need to shape up and improve their competitiveness perhaps through mergers and acquisitions or risk being phased out.

## Implementation

### 1. Who are we targeting?

Most likely, we are targeting pregnant women and the women who are preparing to become pregnant, especially older moms, who usually have decent disposable income but bear higher risk in pregnancy. The current cost for regular hospital visiting at average is at least \$50, which does not include drugs (World Health Organization, 2010). This number can easily rise up to 50% to 100% more, depending on the size of the hospital. Unfortunately, not all women can afford this amount of cost regularly. Therefore, our services provide an alternative for health monitoring. In addition, a number of pregnant women still need to work during their pregnancy, which makes them require autonomy and mobility during this time.



## 2. How to deliver values to them?

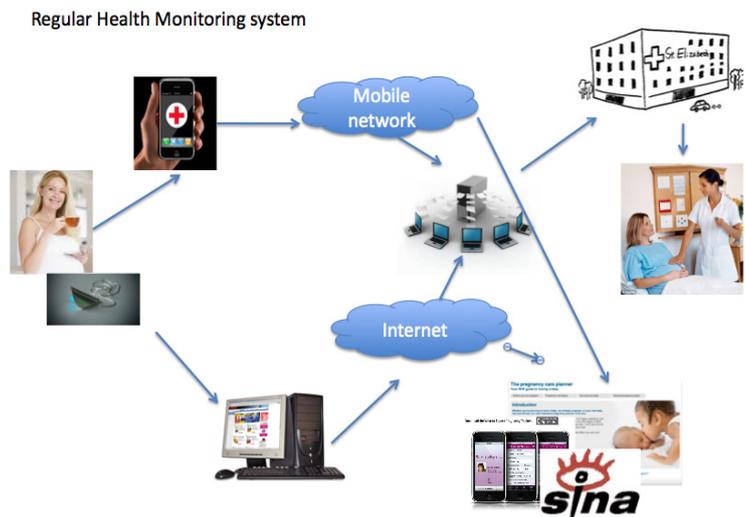
### Product

FMPN includes the health monitoring products and services by operating the entire network. The health detection equipment consists of two components: one multi-functional monitor that can be placed in the household; and a watch-size sensor that can easily connect to mobile devices, and is also easy to carry but only has limited functionality in monitoring.

### 3. How does FMPN work?

#### A. Regular monitoring process - to increase health awareness

1. Pregnant women use the sensor, which connects to the mobile phone to collect information about various body indicators, such as blood pressure, blood glucose levels, weight, blood oxygenation and other physical signs.
2. Information is then transferred to the hospital terminal database for detection.
3. Authorized medical professionals are able to access the database and make their professional assessment, which is useful for disease prevention.
4. The computer is able to capture the extraordinary data and identify patients; Medical doctors make professional assessment through combining patient's personal information that pre-existed in database and new collected information.
6. System automatically sends reminders to registered users in case any incidence takes place.



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#### B. Crisis Management - to minimize potential risk in pregnancy

In urgent situations like the 'breaking of water' where contractions and the birthing process begins, patients can send a special code through their cell phone to the relevant hospital, where the preparation work will start. When the pregnant woman arrives in the hospital, medical professionals will have all information readily available, such as medicine allergy history and medical history, which will greatly increase the efficiency and accuracy of the care.

#### C. Online information sharing - to take control of your health

In addition, these future moms can also access the Internet and join internal networks for further information, such as nutrition, prenatal care and knowledge about infants. This network is similar to most social networking sites that only provide platform for users to generate contents. However, in this site, the information shall only be health or pregnancy related. For technical support, we will collaborate with Sina. Com, which is the largest Chinese Language Informative web portal attracting 10 million active users, 94.8 million registered users and 3 billion page views. On the one hand, Sina.Com will promote FMPN on their website; on the other hand, we are able to outreach the bloggers in Sina Blog to expand the network arena. In order to facilitate discussion on our online forum, the medical doctors will also be invited to our network to provide professional advice for the general public. This network will be getting more powerful once more people voluntarily join it and share their knowledge.

### Promotion

In the introducing period, FMPN's goal is to increase general public awareness on pregnancy and the existence of FMPN. Therefore, mass media, such as television, newspaper, radio and Internet, are all utilized to pass down the message to general public. FMPN will work closely with



government officials, policy makers, state-owned hospitals, private hospitals and clinics. Married people will receive free brochure introducing FMPN and some pregnancy information from Civil Affair Bureau when they are registering the marriage, and in sexual education seminars. People also will be exposed to larger posters and brochures distributed to medical institutions.

The next goal for FMPN will be the social acceptance. As mentioned above, FMPN promotion will expand to virtual world through alliance with Sina.com and largest Chinese searching engine Baidu.com. Sina users will receive notices on FMPN and the largest Internet-educated customers will be outreached. Nevertheless, FMPN will use various marketing communications, like storytelling in their commercial, to better connect to the potential users. During the period, the information will be more specific and inspiring, in order to encourage free trials in potential consumers.

In the introductory period we will be providing, for the women interested, the first two months of services for free and with no equipment rental rate. They can choose to continue the services or cancel FMPN at any time after the two months. All registered women can benefit from the fact that they are already sharing their medical information with medical institutions, which can provide further accurate information for them next time.



## **Pricing of the product**

Pregnant women can purchase only the small size sensors for mobility at \$20 each and rent the bigger size multi-functional monitors from hospitals. Therefore, they only pay for the small sensor, rental rate of home monitoring equipment and network services fee per month. As part of promotion, renting the sensor will be for free for the first two months. After the trial period, the rental cost should be as low as possible to make it affordable to the maximum number of users. With the help of research institutions, the monthly rent can be pushed as low as 1\$ per month. However, we request for household monitor rental deposit at the same level as replacing cost with \$60.

## **Place**

The major distribution channel for monitoring equipment and mobile sensors is registered hospitals. Once people decide on this program, they must provide their accurate information to the hospitals that they are planning to share information with. However, they also can change the hospital for giving-birth and have full control on who they want to share information.

# **Partners & Investors**

## **Partners**

The main partner groups for the product are seen to be associations or groups that are of the medical profession and hold the ideal of women health in high regard. Chinese Academy of Science will be the ideal options for scientific alliance. Peking University is the top medical university in China (Study in China, 2009) and has a wide range of schools relating to a number of health sections, not to mention highly qualified staff that operates in 5 affiliated hospitals. Meaning their knowledge would be an invaluable asset in the development and structuring of the FMPN. Nevertheless, several meters away from Peking University, Tsinghua University can be another alliance partner in technological development. Our strategic alliance can expand to more than 150 universities of 30 countries that already intercollegiate cooperative relations with Tsinghua (Tsinghua University, 2008), simply meaning other opportunities will be emerging in our global expansion in the later growth of FMPN. Therefore, our FMPN technological headquarter will be located in north-western side of Beijing, where have sufficient academic involvement and corporate participation in "China Silicon Valley", Zhong Guan Cun. (Picture 6)



Nevertheless, we also can seek for social help from organizations like the Medical Women's International Association (WMIA), which consist of female doctors from the 5 continents of America, Asia, Australia, Africa and Europe. By co-operation with MWIA, FMPN gains more social perspectives in solving real problems, such as child care.

Accordance with market analysis, a Joint Venture would be the best method of market entry and as such an alliance with Royal Phillips would be the best course of action. The benefits are clear from the fact Phillips is among the top 3 medical suppliers. They have an in-depth and established knowledge of the Chinese Market, meaning they will have access to better marketing channels. Technology is also another benefit, as they already have a number of facilities and offices that focus on research and development. Chinese domestic medical equipment company Global expansion could also be another attainable benefit through relations with Phillips.

## Investors

Since FMPN is considered as a social-technical initiative in China, FMPN can request funding from Chinese government, who certainly show great interests in developing third information technological revolution with pre-approval budget. Also, Chinese government already imposed FDI favorable policy by “allowing small and medium size companies” to borrow up to 4 times of their registered capital and large companies up to 6 times. companies We also can collaborate with academic and research institution for funding. For instance, the Chinese universities pose an interesting investor opportunity in this situation already. Another financing opportunity can be more corporate involvement from Zhong Guan Cun.

# Financial Prospect

Input Variables	Value	2011	2012	2013	2014	2015	2016 +
Monitor Equipment Cost	40	4000000	200000	214000	246100	283015	325467
Sensors Management Costs	10%		400000	420000	441400	494312	526858
Users Number	100,000	100000	105000	112350	129203	148583	170870
Grow rate		5%	7%	15%	15%	15%	7%
Rental revenue	9	900000	945000	1011150	1162823	1337246	1537833
R&D Donation	100,000	100000	100000	100000	100000	100000	100000
Initial Investment		1000000					
Network maintenance costs	100,000	100000	105000	112350	129203	148583	170870
ROI	15%						
Investment		5,000,000					
Total cash flow		900000	340000	364800	446120	511337	614637
Discounted Cash Flow		782609	257089	239862	255071	254225	6146370
Grow rate	5%						16296905
NPV	23,085,759						

The project is of huge scale and various aspects of financing must be considered. An investment is necessary to launch the program, in setting up partnerships with hospitals, online services platform, and media advertising cost.

Once the product is launched, there will be some addition cost in network maintenance, customers supports and administration cost. While, services fees and rental fees will also become the major revenue for FMPN.

The project is planned to be implemented as a joint venture with Phillips and the medical monitor and sensors are bought directly from the company at the price of \$60 and

\$16 respectively. Therefore, FMPN is not in charge of manufacturing and product modification. In the financial report, the sales revenue of sensors and monitors are not included in the analysis, because our main purpose is not to sell devices, but sell our services.

The initial cost of the project is considered to be \$5, 000,000 - this includes the cost of launching as well as purchasing the first set of devices for rent. One can assume that if in mass production for Chinese market, the economies of scale can push the price of sensor as down as to \$40/piece. One sensor should last for approximately 5 years, however, the replacement cost of new sensors is considered 10% a year from the total costs, that also includes some repairing and management costs.

As two first months of renting the equipment is for free and the average time of renting the device is 9

months, then the average income per sensor is about 9 dollars per year. The project is planned to start on a relatively small scale, with 30,000 customers at first year and gradually growing – 5% on the first year, 7% on the second year, 15% from the year 3-6, and 7% from then on. Additional revenue of 100,000 is planned to be received from research institutions yearly.

As several investors are involved in the project, the required rate of return on investment is considered 15%, which should capture the potential risk of operating on Chinese market.

Even with so low rental cost and number of users, the net present value of the project is around 5 million dollars. Therefore, as the NPV is positive, one should definitely pursue the project!

## Risk and Mitigation

The most dangerous risk for FMPN will be consumers not being able to see the immediate value of this product, resulting in a low adoption rate. Some consumers may be reluctant to sign up to the network because of a perceived risk associated with the product and services, such as loss of personal information, mobile phone radiation, replacement cost of sensors and potential increase in fee or taxation due to government interference. These problems can be reduced and managed through better information management, effective marketing communications, continuous product and services innovation.

Although there is clearly evidence that the government will encourage the widespread adoption of WSN, we also need to watch out for the risk associated with project approval process. Therefore, co-operating with local partners will be extremely helpful in terms of dealing with the complex connection or “Guanxi” in China. We can leverage the knowledge of our partners and lobby government.

Other risks might come from strategic alliance with partners. There are also methods that can be used to reduce risk from alliance, such as careful partners selection, signing clear mutual agreement, and operation integration. However, we also need to understand the significant role of “trust” in international business, especially in a country like China where long term relationship is highly valued. Therefore, balancing “trust” and legal enforcement is also necessary to promise the preferred future.

## Conclusion

Based on our research, FMPN will be launched in the coastal cities, like Beijing, Shanghai and Shenzhen, where they have better technical and capital resources. In later stages, we will be expanding to the more central area of China. We are planning to use a six month period to lobby government officials and to initialize co-operative relations with partners mentioned in the above report. The equipment re-engineering will take about three months, according to estimates. The remaining three months will be our market approaching to the major hospitals and health care centers. Next year April, FMPN is ready to be launched into the market. We are expecting the growth rate in first year will be 7% and 15% in the following years.

We have a strong belief that FMPN will become a truly remarkable social and technological initiative, that benefits millions of parents in China. Once FMPN begins to show real progress and adoption, similar applications will be able to be introduced into other areas to attempt solving issues such as the aging population in Chinese market.

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