



*Mobile Robot Solutions for Safety, Security, and Service™*

# Family and Health Care

## Near Term Markets

Prepared by Mountain Marketing, Inc. March 11, 2013

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*This document is intended to keep stockholders of GeckoSystems informed of company events which, while being non-material in nature, we believe to be of interest to them.*

*It may not be relied upon in connection with the purchase or sale of any security.*

## **About GeckoSystems:**

GeckoSystems has been developing *Mobile Robot Solutions for Safety, Security, and Service*.™ for over fifteen years. You can find a brief history of the company here:

[Mobile Robots are in Our Future - Martin Spencer.](#)

## **A world wide elder care crisis is looming**

The Japanese elder care situation is unique. The Japanese “Silver Tsunami” will happen before the US elder care situation becomes severe enough to for the government to take action. Uniquely Japanese demographic issues exacerbate the Japanese elder care situation. China will be looking at similar issues in the future due to the government's “one child” policy enacted in 1976 by Deng Xiaoping. Still Japan must take the lead out of necessity in order to minimize the economic impact of an elderly population while providing good care for honored elders.

## **On the situation in Japan:**

“...Japan is on the cusp of an even more radical demographic makeover than the one now under way in Germany and other countries that are in a similar situation, including Italy, Hungary, and Croatia. (The United States is also aging, but its population is still growing.) Within barely a generation, demographic trends promise to turn Japan into a dramatically—in some ways almost unimaginably—different place from the country we know today. If we go by U.S. Census Bureau projections for Japan, for example, there will be so many people over 100 years of age in 2040, and so few babies, that there could almost be one centenarian on hand to welcome each Japanese newborn. Population decline and extreme population aging will profoundly alter the realm of the possible for Japan— and will have major reverberations for the nation’s social life, economic performance, and foreign relations. Gradually but relentlessly, Japan is evolving into a type of society whose contours and workings have only been contemplated in science fiction. It is not clear that Japan’s path will be a harbinger of what lies ahead in other aging societies. Over the past century, modernization has markedly increased the economic, educational, technological, and social similarities between Japan and other affluent countries. However, Japan has remained distinctive in important respects—and in the years ahead it may become increasingly unlike other rich countries, as population change accentuates some of its all but unique attitudes and proclivities. ”

<http://www.wilsonquarterly.com/article.cfm?aid=2143>

## **On the situation in the United States:**

The US will have its unique issues, but due to lack of historical national health care the total economic impact of elder care is not well understood and the government is not giving it the attention that it should. Statistics are that 61% of US mothers work outside the home versus 34% in Japan. These middle-aged parents are called the “sandwich generation.” When they have to take care of parents and their own children, the mother must often quit outside work or reduce hours, creating financial distress in addition to the time and emotional stress of caring for an elderly parent and her own children. Hence the term "sandwich generation."

[http://www.nationmaster.com/graph/lab\\_wor\\_mot-labor-working-mothers](http://www.nationmaster.com/graph/lab_wor_mot-labor-working-mothers)

## **Information on the “Sandwich Generation” from an international perspective:**

“Who is the Sandwich Generation? First of all, they’re not really a single generation according to the Council on Contemporary Families – in the U.S., the majority of people with elder and childcare responsibilities are between 28 and 42 years old, but many are older (38 percent are between 43 and 61 years old) or younger (7 percent are younger than 28). As for how many belong to this group, according to the Pew Research Center, one of every eight Americans aged 40 to 60 is raising a child and caring for a parent, either physically, financially or both. Researchers Margaret B. Neal and Leslie B. Hammer found that a typical American “sandwich couple” consists of a 44-year-old man and a 42-year-old woman with two children in the household, with husband and wife each spending the equivalent of one workday or more each week caring for parents, stepparents, or parents-in-law.

The story is similar across the world: According to 2011 statistics from the OECD, across the OECD countries more than one in ten adults is involved in informal, generally unpaid, care giving. And in Asia, according to a study by the Economist Intelligence Unit, members of the Sandwich Generation are typically between the ages of 30 and 45, married, and supporting one or two children and two parents or parents-in-law – and this group is an estimated 20 percent of the working-age population. In China, the numbers increase to 36 percent.

The financial implications for these dual caregivers can be significant. More than one-third of Asia's Sandwich Generation members have had to work harder to cover family expenses. UK newspaper The Telegraph recently reported that the Sandwich Generation spends an average of more than £3,500 a year supporting both their children and their own parents, with three out of five people in this group saying the cost of helping dependents was preventing them from enjoying the lifestyle they had anticipated. In the U.S., the rise in medical costs for the elderly and skyrocketing college tuition for young adults has created a double whammy. ”

<http://knowledge.allianz.com/demography/population/?1977/caught-in-the-middle-the-sandwich-generation>

### **This is a worldwide problem:**

“It's true that the world's population overall will increase by roughly one-third over the next 40 years, from 6.9 to 9.1 billion, according to the U.N. Population Division. But this will be a very different kind of population growth than ever before -- driven not by birth rates, which have plummeted around the world, but primarily by an increase in the number of elderly people. Indeed, the global population of children under 5 is expected to fall by 49 million as of mid-century, while the number of people over 60 will grow by 1.2 billion. How did the world grow so gray, so quickly? ”

[http://www.foreignpolicy.com/articles/2010/10/11/think\\_again\\_global\\_aging?page=full](http://www.foreignpolicy.com/articles/2010/10/11/think_again_global_aging?page=full)

*(Please note, one must login to access the URL above.)*

### **From the same article cited above – US vs. Asia**

“But the outlook is even worse for Asia. Those who predict a coming Asian Century have not come to terms with the region's approaching era of hyper-aging. Japan, whose "lost decade" began just as its labor force started to shrink in the late 1980s, now appears to be not an exception, but a vanguard of Asian demographics. South Korea and Taiwan, with some of the lowest birth rates of any major country, will be losing population within 15 years. Singapore's government is so worried about its birth dearth that it not only offers new mothers a "baby bonus" of up to about \$3,000 each for the first or second child and about \$4,500 for a third or fourth child, paid maternity leave, and other enticements to have children, it has even started sponsoring speed-dating events.

China, for now, continues to enjoy the economic benefits associated with the early phase of birth-rate decline, when a society has fewer children to support and more available female labor for the workforce. But with its stringent one-child policy and exceptionally low birth rate, China is rapidly evolving into what demographers call a "4-2-1" society, in which one child becomes responsible for supporting two parents and four grandparents.

On its current course, the U.S. population of 310 million will continue to grow relative to that of the rest of the developed world, primarily because its birth rate, while barely at replacement level, is still higher than that of almost any other industrialized country. In purely geopolitical terms, this suggests American influence over Europe, Japan, South Korea, and other allies could grow. Yet the United States has no reason to be smug about its comparatively favorable demographics. As its allies age and even shrink in population, the United States could be forced to assume even more of the burden of policing the world's trouble spots. Like a person in middle age, the United States now has to worry not only about its own aging, but also about how to provide for other family members who are becoming too old to fend for themselves.

And age America will. The main reason for its comparative youthfulness so far has been immigration, both legal and illegal. But according to a recent study by the Pew Hispanic Center, the number of illegal immigrants thought to be entering the United States has plunged to just 300,000 people annually -- down from 850,000 in the early 2000s. More than a million immigrants from Mexico and elsewhere in Latin America have returned home in the last two years. These falling numbers are largely driven by the soaring U.S. unemployment rate, which has at least temporarily reduced the economic rewards of moving to El Norte, but they could herald a permanent shift. ”

[http://www.foreignpolicy.com/articles/2010/10/11/think\\_again\\_global\\_aging?page=full](http://www.foreignpolicy.com/articles/2010/10/11/think_again_global_aging?page=full)

## **U.S. companies fail to develop robotic elder care and personal assistance applications:**

At this time monitoring systems like GE/Intel Care Innovations are the only ones being introduced in the U.S. commercial market and this is available for assisted living only. Most of the elder care robot research is being done in Europe and Japan. The fact that the US is seriously lagging in robotics development in general is made clear in this report:

“In the EU and Korea they are stimulating the robotics industry to fulfill national strategic goals such as keeping and growing homeland industry AND solving a particular set of problems, eg, how to help educate Korean children to learn a second language, English, using robots to supplement teachers. Another example of this type of strategic funding is the EU-funded SME project which also had twin goals: keep manufacturers from going offshore and provide robotic assistance to small and medium-sized enterprises, a new marketplace which, with robotic automation, will be able to better compete and remain at home.

The US doesn't have anything similar but it should because robotics is an industry that has passed us by once and could continue that way again without guidance. \$100 million in focused stimulation money could go a long way toward re-establishing a leadership role. The American tradition of entrepreneurial funding and product development just can't work on a project of the size and scope that I am suggesting. And the alternative, just let nature take its course, will likely lead to a similar movement offshore as occurred with industrial robot - where the major manufacturers are located in Europe and Japan.”

<http://www.everything-robotic.com>

## **A worldwide overview of the relative position of the US in the robotics market:**

“The political climate in the US just isn't committed to robot healthcare solutions—at least not in juxtaposition to defense robots. Just imagine a DARPA robotics challenge for healthcare robots... Instead of BigDog, we could have Service Dogs; instead of Petman, we could have an in-home helper; instead of soldier extraction, we could have robotic nurses. Sure, DARPA's current challenges will ultimately help advance all of these, but why not tackle it head on? The saddest part... real healthcare robot advances (like Johnson & Johnson's old iBot wheelchair) are discontinued due to burdensome regulatory environments. Half of Mr. Engelberger's \$700,000 could be eaten up by consumer safety certifications.

Scaling up from prototype to a mass-produced eldercare product is massively expensive. It's possible to build a prototype home healthcare robot for \$700,000. But investor confidence in the business plan and subsequent funding is often more significant than the actual technology. Consider Rethink Robotics. Sure, they're making strides in mass production of low-cost robots, but their real innovation is discovering a VC-appealing business model to make it happen. And even then... Rethink required more than \$60 million to get over the initial hump. Even Kiva (an arguably less-complex robot) required \$33 Million in VC funding to scale up before the Amazon acquisition. **There's just no way to bring such a robot to market for under \$700k at this time.** Engelberger hedged this by saying he wanted a deep-pocketed partner to handle the burden of production, inventory, marketing, and distribution. And that doesn't even address the hardest part: software.”

<http://spectrum.ieee.org/automaton/robotics/home-robots/where-are-the-eldercare-robots>

GeckoSystems disagrees with the conclusion in bold above. With \$700k we believe that it would be possible to put a functional version of the CareBot™ into the U.S. market for approximately \$12,000 retail. This is made possible because of recent dramatic cost reductions in computer and sensor technology and GeckoSystems' advanced AI software ability to run very well on low cost, commodity personal computer systems.

To date, it seems that Kompai, a EU effort, is the only elder care robot other than GeckoSystems' CareBot™ that has been tested in private homes. Kompai did a press release about in home trials last year, but at this time we have not found a link to the results of these tests. GeckoSystems began in home testing of the CareBot™ in 2002.

[http://www.geckosystems.com/markets/CareBot\\_trials.php](http://www.geckosystems.com/markets/CareBot_trials.php)

Robosoft, the commercial partner to the academic community working on Komapi has an excellent overview of personal assistance robotic efforts on its website, the CareBot™ is listed as a direct competitor. Note that the functions of the CareBot™ have been enhanced since 2005 but GeckoSystems still expects it to retail in the same price range because of cost reduction in sensors and other systems.

[robosoft Comparison Chart](#)

Because GeckoSystems has representation and contacts in Japan we have chosen to focus our elder care marketing efforts there at this time. In 2010 GeckoSystems CEO Martin Spencer met with senior Japanese government representatives to discuss robot safety:

"We are very impressed (with) your effort to spread robot technology to the field, especially for the elderly care, showing on your website. Communication between CareBot™ and elderly was fascinating in the real caring field. In Japan, we are trying to establish the legal issues for developing and spreading elder care robot technologies to such areas... By doing this we would expect to open up the way to develop and establish Japanese standards and legal systems for personal robot providers," stated Dr. Kentaro Kotani, Professor, Kansai University, representing the Japanese government's New Energy and Industrial Technology Development Organization (NEDO) Dr. Kotani is also a member of the Project Steering Committee under the management of the Japan Automobile Research Institute.

Accompanying Dr. Kotani at this mobile robot safety summit was Dr. Masahiro Kato, General Manager, Department of Robot Technology Promotion, Manufacturing Science and Technology Center (MSTC). Dr. Kato was intimately involved in Hitachi's personal robot R&D for many years.

Drs. Kotani and Kato are master roboticists due to their formal, advanced educations and many years of significant involvement in Japanese mobile robot R&D. Their senior roles within their respective organizations substantiate they are within the inner circle of Japanese robot industry strategic planning and decision making officials"

[http://www.geckosystems.com/investors/press\\_releases/20101220\\_GeckoSystems\\_Sr\\_Japanese.php](http://www.geckosystems.com/investors/press_releases/20101220_GeckoSystems_Sr_Japanese.php)

As noted above - Dr. Kentaro Kotani represented NEDO – here is a link to a recent report on NEDO's technology goals. NEDO goals for robotic healthcare:

[http://www.nedo.go.jp/english/introducing\\_project1\\_6.html](http://www.nedo.go.jp/english/introducing_project1_6.html)

## **Third parties have validated GeckoSystems' technology**

In July of 2012 Markets and Markets found GeckoSystems to be significant:

“The key market players in service robotics industry are Honda Motors (Japan), iRobot (U.S.), AB Electrolux (Sweden), Sony (Japan), Fujitsu (Japan), Toyota (Japan), GeckoSystems (U.S.), and Yujin Robot (South Korea).”

[http://www.researchandmarkets.com/publication/9rvoof/personal\\_profess](http://www.researchandmarkets.com/publication/9rvoof/personal_profess)

GeckoSystems is #1 in navigation technology and has an extremely sophisticated AI platform designed specifically for mobile service robots, or "second generation" robots. GeckoSystems also stands alone in that it has always developed its technology within the constraints of creating an affordable and marketable product, something that larger companies seem unable to do.

In September of 2012 ZMP of Japan, a robotic company that serves the educational market world wide, evaluated GeckoSystems BaseBot™, a simple robot that uses GeckoSystems' SafePath™ navigation system. The joint press release below was distributed by ZMP on September 24, 2012:

### **Business collaboration between ZMP and GeckoSystems: Report No. 2**

“This will involve technology exchange and joint marketing of autonomous mobile robots and next generation mobility. We have successfully completed our technical evaluation of GeckoSystems' autonomous mobile robot.

ZMP Inc. (Bunkyo-Ku, Tokyo, CEO: Hisashi Taniguchi, ZMP) and GeckoSystems International Corporation (Georgia, CEO: Martin Spencer, GSIC) announce that ZMP has successfully finished the technical evaluation of GSIC's basic technology robot platform "BaseBot" (nicknamed "Lou").

In our first press release, ZMP and GSIC announced the signing of a memorandum of understanding concerning technical exchange and joint marketing efforts in Japan, the United States and internationally. We are now moving forward to negotiation of project collaborations. The first phase of the collaboration was ZMP's technical evaluation of GSIC's basic technology platform the "BaseBot." BaseBot is a wheeled robot platform about 100cm in height that uses Kinect-type depth cameras as external sensors.

The BaseBot is equipped with the basic hardware and software required to operate an autonomous mobile robot. The software of the BaseBot was high quality and had a fully developed configuration interface required to apply this technology to autonomous mobile service robots. GSIC's line includes its flagship model, the "CareBot" that uses the sophisticated navigation of the BaseBot and a more advanced user interface. Since the CareBot™ is mainly used for assisted living for the elderly, which is a promising market in Japan, ZMP intends to actively promote these products. The goal of both companies is to develop mobile service robot technologies and products that will enable people around the world to live a more independent, safe, and comfortable life. ZMP's press release in Japanese:

[http://www.zmp.co.jp/html/press\\_20120924.htm](http://www.zmp.co.jp/html/press_20120924.htm)

<http://response.jp/article/2012/09/24/181870.html>

#### **GeckoSystems' press release:**

[http://www.geckosystems.com/investors/press\\_releases/20120927\\_ZMP\\_Evaluates\\_BaseBot.php](http://www.geckosystems.com/investors/press_releases/20120927_ZMP_Evaluates_BaseBot.php)

#### **Detailed Information on the BaseBot:**

<http://www.geckosystems.com/markets/BaseBot.php>

There are no other robot companies with a marketable personal robot solution, not only in the US, but also in the world. No other robot companies have safe autonomous (SafePath™) navigation. This is why it would be very important for GeckoSystems to find a joint venture partner to create a Japanese version of the CareBot™ and show the world that personal service robots can help the elderly to live a better, more independent life. As in the marketing of hybrid cars such as the Prius, it is likely that the Japanese could lead in the "second generation" of the personal robot sector, and achieve significant economies of scale. GeckoSystems would bring this joint venture cost reduced personal robot back to the US and develop a version for our market, much like the Japanese automakers have done very successfully for some decades now.

Since an important part of what makes the CareBot special is the integration of cultural and family values into the care taking performance of the robot, there will be many versions of the CareBot around the world. We hope that Japan will be the first of these, and that by working with GeckoSystems to exploit the extensible AI architecture of the CareBot, the joint venture will also develop a culturally portable consumer and commercial product that can be the foundation for world wide marketing.

GeckoSystems has several JV discussions ongoing in Japan and China.

## Chinese Situation and Contacts

GeckoSystems has had continued interest in their technology from as early as 2009.

“The Guangzhou Industrial Development President, Mr. Luo stated, "We look forward to GeckoSystems' visit to demonstrate. Guangzhou, China is a portal to the Chinese robotic world and has vast resources. We can help GeckoSystems accelerate its product development and enhance its competitive advantage, cost-effectively, so that GeckoSystems can meet not only China requirement but also the world market demands," Mr. Luo added.

"SIASUN has always been devoted to the development of state of the art robotic technologies. We continually work to put our excellent science and technology into the real work force. I look forward to our joint mobile robot development work with GeckoSystems," stated Dr. Fang Xu, Director.

GeckoSystems has projected the Pacific Rim personal robot sales forecasts in the eldercare markets for the years 2010 to 2014. For over ten years the company has had numerous market size discussions with significant international firms in China, Japan, South Korea, Hong Kong, and Taiwan. The Delphi market research methodology indicates two disparate markets in China: One is the very large market segment (i.e. many millions of families) of new millionaires looking to make prestige purchases of new Buicks, etc. Last month GM sold over 38,000 Buicks in China. At an annual run rate of over \$10B, these prestige purchasers are very profitable for GM and can be for GeckoSystems. The other significant Chinese market is for care of the 20,000,000 plus elderly living in dormitories due to their only child working in the industrialized cities. These two market segments alone indicate a Chinese marketplace of several billions of dollars in the next five to seven years. ”

[http://www.geckosystems.com/investors/press\\_releases/20090915\\_Heightened\\_Interest.php](http://www.geckosystems.com/investors/press_releases/20090915_Heightened_Interest.php)

Again in 2011, GeckoSystems received significant interest from the Chinese:

“GeckoSystems will realize a significant boost in exposure of its new "collision proof" wheelchair technology using its mobile robot solutions. This agreement enables GeckoSystems' technology to have more credible worldwide visibility for their new technologies as well as their mature technologies. This will give GeckoSystems a competitive cost advantage entering into commercial markets such as healthcare, security, and government applications.

It has been agreed that there will be an exchange of stock between GeckoSystems and Nanle. GeckoSystems' CEO will have a seat on the board of directors for the newly created company. Mechanical design criteria for a more appropriate wheelchair configuration designed to leverage the benefits of power mobility under artificial intelligence (AI) navigational control, has already been submitted to the Chinese engineers that will be working with Nanle. Both parties agreed that: In order to protect safety and security of the people and society from terrorists, the core technologies shall be strictly confidential and the JV Company and the Wheelchair Manufacturer shall take special care to keep the technologies secret. ”

[http://www.geckosystems.com/investors/press\\_releases/20111129\\_Chinese\\_JV\\_Signed.php](http://www.geckosystems.com/investors/press_releases/20111129_Chinese_JV_Signed.php)

Both efforts failed because GeckoSystems was unable to raise sufficient funds in the public market to finalize the joint venture. Nonetheless, Chinese interest continues unabated. The Chinese government continues to be under pressure because of its commitment to extend medical coverage in rural areas by 2015. Telepresence robots for medical use are desperately needed. GeckoSystems has a complete “plug and play” AI mobile service robot system that could be adapted to medical telepresence easily.

iRobot is working on a similar system in the U.S., the RP-VITA. It is not for sale at this time, available only by lease. An expanded need for wheelchairs is another result of the 2015 health initiative. GeckoSystems had hoped that introduction of the SafePath™ wheelchair in China would lead to adoption of the technology internationally. The document below explains why:

[SafePath Wheelchairs - the Need and Benefits - PDF](#)

**GeckoSystems has had the following white paper translated to Chinese and Japanese.**

[Base Bot Presentation -PDF](#)

[Base Bot Presentation in Japanese - PDF](#)

[Base Bot Presentation in Chinese - PDF](#)

Additional technical information

[High Level Systems](#)

[Low Level Systems](#)



The 2005 CareBot™ with our Compound Sensor Array™ along with a 2012 concept drawing of slimmed down, simplified design which has become possible with the advent of the depth camera and other improved technology.

The CareBot™ has always been developed within the constraints of affordability and the use of off the shelf components whenever possible.

Designs are trademarks of GeckoSystems.