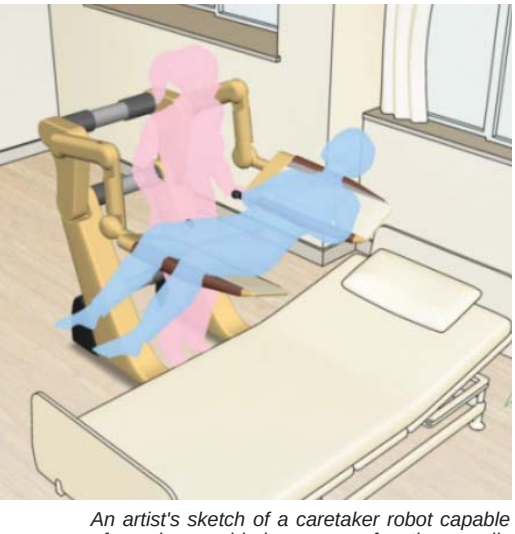
Robots As Home Electric Appliances
– All-Round Living Support Eyed –

By Tsuga Kazuhiro

Japan's population is aging rapidly at a pace not seen elsewhere in the world. In 2007, the first post-war generation of baby boomers will reach retirement age, and people will be leaving the workplace in massive numbers. In response, supportive systems and structures are being set up, but they stop short of helping physically and mentally waning elderly people in the various actions and tasks they must do in daily life. For the elderly to lead a more comfortable life, a device that caters to individual lifestyles and can give appropriate support in various everyday situations becomes a necessity.

Japan boasts by far the world's largest output of industrial robots. In fiscal 2005, the country's robot shipments totaled ¥690 billion. It also has nearly 360,000 robots in operation, grabbing the world's biggest market share (42%) of active robots. Panasonic holds a high market share in areas such as electronic packaging machines. A significant trend emerging in Japan now is to use the accumulated technology of industrial robots in developing personal living-support robots as one of the next-generation industries matching the needs of an aging society.

Photo: Matsushita Electric Industrial Co



An artist's sketch of a caretaker robot capable of carrying an elderly person, a function usually requiring two caretakers

Definition of Living-Support Robots

Generally speaking, robots are defined as automated machines that sense and make an intelligent response to surroundings and objects for a specific purpose, and perform the appropriate task. One big reason that has made the personal living-support robot very close to becoming a reality is that CPUs have become faster in performance and larger in memory capacity. Also, the various technologies needed in robot development have made great advances. For example, sensors have become smaller thanks to micro-electro-mechanical system (MEMS) technology, while progress has been seen in power electronics and control software technology. As a result, it has become possible to make more compact automated machines capable of doing tasks burdensome for humans such as carrying heavy objects or cleaning. In many cases, a part or the whole of such a machine moves about, and it is the moving machines that are called robots.

With moving machines, people often get the impression that they are animate, and tend to connect emotionally with them. This human inclination can be used to advantage in developing robots easy to use for people who are not good at manipulating machines. An aspect of communication can be programmed so that robots can recognize verbal or gestural instructions, predict human action, make verbal or gestural responses and carry out action ordered. While expert training is required to handle industrial robots, living-support robots have a more people-friendly interface and can be defined as machines that anyone can use in their daily life to automatically perform specific functions.

Matsushita's Robotic Home Appliances

Massage chairs and the "JOBA" horseback-riding fitness equipment are examples of the living-support robots that our company has developed. Although they may not look like robots, they are equipped with control mechanisms tailored to the human body and have sensors that recognize body condition. They are products that utilize robot technology, and hence our company regards them as robots. JOBA, in particular, has become a hit product. It has been popular since around 2003 for its reputation for ease of use and the benefit of fitness. It is not only simple to use – one only has to sit on it – but effective for people with back pain and for those seeking to stay fit.

The air conditioner with a "cleaning robot" introduced in Japan in the spring of 2005, which automatically cleans filters, is another of our hit products. Since its launch, it has enjoyed extremely good sales, with many people asking specifically for the product. Total domestic shipments of air conditioners came to 7,573,000 nits in fiscal 2005. Thanks to the popularity of the robot-cleaning air conditioner, our company had the largest domestic share of 18%. Other companies have introduced similar products and now it has become standard for air conditioners to be equipped with cleaning robots.

Contributing to the sales of the robot-cleaning air conditioner was its successful marketing method. The effective naming of the product made its function easy to understand. But the popularity of the robot-cleaning air conditioner lies in its practicality, and this is something that must come foremost in all robotic home appliances. In this respect, the easy-to-use JOBA and the robot-cleaning air conditioner have

certainly played a significant role in shaping the future of the robotic home appliance market.

From R&D to Business

In research and development, our company aims to create robots that function as very practical tools. Since there are still many things that are unknown about the living-support robot market, we conduct consumer surveys at appropriate intervals. From these surveys we have learned about needs such as for physical assistance and transport of heavy objects, as well as for maintenance services such as cleaning and tidying up. There is also a need for services such as looking after children and home security to guard against break-ins.

At our R&D division, elemental technology is being developed to create robots that can provide the functions to meet these needs. Since it is important in robot development to actually make things that move, we hold demonstration experiments in environments where robots are expected to be used. Through such experiments, safety examinations can be made, and areas that need improvement that were not foreseeable in the laboratory become clear, making them the next goal to focus on in development.

Let me give an example. We have created a prototype porter robot to carry baggage, and we are currently showing it at airport events to conduct tests on aspects such as its running potential and ability to avoid obstacles. The results in autonomous mobility technology that we gain from this robot can be utilized in making more sophisticated house cleaning robots. We are also developing a robot that can assist in gently transferring people. Such a robot is likely to be a big help since transferring people between beds, wheelchairs and other places is one of the most physically strenuous tasks for caregivers. The big question we always have in mind during development is whether something will be practical and be of market value.

Photos: Matsushita Electric Industrial Co

A porter robot (prototype)
A typical tool-type robot that carries luggage and follows its possessor

Based on the technology development that we are achieving in these areas, we are confident that we can announce the creation of new robotic home appliances within a few years.

When linked with IT, living-support robots will be capable of predicting the intentions and actions of people and accordingly give helpful services. The merging of robots and IT is a major factor that will allow Matsushita Electric Industrial Co. to achieve the goal of offering wide-ranging solutions to all-round support in people's everyday life.

In Celtic folklore, various spirits and fairies in the house, town and woods extend help to the good people who are in need of support. Far off in the future, I envisage a world where robots are placed everywhere in the house and in the town, and everyone lives happily ever after, as in a fairy tale. JS

Fitness device JOBA simulating horseback riding based on the latest robot technology

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