

Chapter 5 New Markets and New Businesses – Present and Future

5.1 Introduction

This chapter will take up three promising industries, attempt to characterize their current situations, extract the problems and discuss how to deal with them from the viewpoint of new market creation or new business formation for the purpose of revitalizing Japan's machine industry.

The three industries to be examined are: health and welfare equipment, medical equipment and related fields, and environmental equipment and related fields. Some promising product segments and companies worth noting will be taken up among these three industries. Encouraging factors for these industries and factors prohibiting their growth (factors within companies or within industries, institutional factors or social factors) will then be extracted. Finally, conditions that can help create new markets, form new

1) Health and Welfare Equipment

① Characteristics and Growth Factors

Reflecting a rapid graying of the population, Japan is experiencing a growing demand for a safer, more reliable, higher quality life as well as for healthier and more proactive social participation for elderly citizens. This segment represents a promising business field that is expected to develop further in the future.

The Welfare Tools Law passed in 1993 (a law promoting R&D for welfare equipment and its dissemination) has positioned the health and welfare equipment industry as a promising business segment. At the same time, the

businesses, and thereby generate a new industrial competitiveness unique to Japan will be discussed (for details, see "Expectations of new markets and the issues concerning supply," Economic Research Institute, Japan Society for the Promotion of the Machine Industry, 2003).

5.2 Present Conditions and Challenges Facing Some Promising Industrial Fields

Three promising fields will be examined by analyzing the following: ①an overview of each industry (characteristics of Japanese industries, promoting factors, domestic market scale, possibilities of new entries); and ②factors prohibiting market expansion or challenges (social system, market system, regulations and institutions, demand-side, intra-corporate or intra-industrial issues, product segments.)

These are summarized below (see chart 5-1 for details).

Chart 5-1

surrounding environment has seen improvements, including the establishment of trade associations.

As a feature of this industry, the United States and European countries are predominant in most tools and equipment. For this reason, Japan's imports of the welfare equipment exceed its exports. Expensive equipment requiring advanced technical capabilities is imported from Scandinavian countries, rehabilitation equipment, including artificial limbs from Germany, and transportation and communication equipment from the United States. Recently, medium and low-priced tools

and equipment are being imported from Asian countries. However, due to differences in lifestyles, the social environment and physical structures, high prices, and difficulty of obtaining after-sales services, however, the degree of dissemination remains low. On the other hand, there is some equipment that emerging in the market utilizes Japan's original strengths or that is linked to Japan's own technologies (such as transportation equipment, alarm systems, barrier-free equipment, etc.)

The market scale is about 1,100 billion yen (FY2000). There do not seem to be many factors prohibiting new entry because of the many niche markets and the availability of mature technologies. Forerunner companies are likely to predominate, however, since there remain some peculiar customs in this segment.

② Factors Preventing Market Expansion and Challenges

There are many challenges confronting Japanese companies in this segment due to the recent massive inflow of inexpensive Asian products, existing high-priced products, and intensifying price competition.

The measures to be taken to revitalize this industrial segment can be summarized as follows: product deployment responding to the market (demand) structure is required; and the target users should not be limited to senior citizens and disabled persons but should be expanded (a concept shift from barrier-free to universal design). Abolition of peculiar business customs and deregulation for new market exploitation are additional important steps that need to be taken. For this purpose,

establishment of a system of receiving and releasing information is urgently needed.

2) Medical Equipment

① Characteristics and Development Factors

This segment, like the health and welfare equipment segment, is expected to expand further, since there is growing demand for advanced medical equipment and technologies as well as for healthier and more proactive social participation by elderly citizens, accompanying the rapid graying of the population.

In this industry, business deployment has been based on a strategy developed by the national government. Advanced research into the technology directly relevant to human lives has been considered necessary and extensive resources have been invested accordingly. Japan is strong in some of the technological fields concerned. For these reasons, not only tools and equipment but also such new fields as biotechnology, which involves extensive relevant services, and pharmaceuticals have developed rapidly.

U.S. companies have an overwhelming predominance in this segment, however, in terms of both technologies and business operations. This characteristic is clearly seen in the sharp increase in imports vis-à-vis the sluggish exports (exports: 360 billion yen, imports: 820 billion yen in 2000), suggesting Japan's low comparative competitiveness. At the same time, there is a large gap between strong fields and weak fields.

While the market scale for equipment was about 2 trillion yen in 2000, the nation's medical expenditures during the same period totaled

about 31 trillion yen. It can therefore be said that the market surrounding medical equipment is also huge. The indicators for the medical industry (business) show that the barriers to market entry are extremely high due to the high technical requirements and peculiar business practices.

② Factors Preventing Market Expansion and Challenges

There are numerous problems surrounding this industrial segment. These include information disclosure, increased imports, Japan's peculiar business practices (dealership), the medical insurance system, and the need to enhance the efficiency and quality of medical treatment, to name a few. There is strong pressure to introduce a market mechanism, improve efficiency and reform the regulatory system in order to restrain the nation's medical expenditures, which are increasing year by year.

The first priority for tackling these problems in order to revitalize this industrial segment is to utilize IT systems to ensure safety and improve efficiency. It will be also necessary for the industry to collaborate with the academic community and the public sector under the industry-government-academia collaboration schemes for the purpose of entering new business fields. In other words, excellent business seeds born in universities should be linked to private enterprise initiatives to enable products full of originality and creativity to be developed. With this as a prerequisite, a system to facilitate prompt authorization of projects and a reliable evaluation system should be established. At the same time, flexibly

structured venture businesses should be nurtured.

3) Environmental Equipment

① Characteristics and Development Factors

This industrial segment is expected to grow further into the future, thanks to the expansion and diversification of social needs.

Development of this industrial segment in Japan was initiated to introduce pollution control measures. The industry has since evolved by responding to resource conservation and energy-saving needs and, more recently, to environmental protection requirements. Negative social activities such as environmental pollution lawsuits, oil crises and global environmental issues have exerted a grave influence on the formation of the market. In other words, this industry is characterized by its strong correlation with growing environmental concerns and new social systems. Furthermore, the industry is hugely influenced by market restraints and conditions. Improvements in the legal environment and institutional setting play a certain role. Although Japan is good at developing equipment and tools that respond adequately to various countries' demands and market structures, Germany stands out as a major player in the segment as a whole.

The market scale of Japan's environment business is 24 trillion 700 billion yen (1997), which can be broken down as follows: (1) environmental pollution management (14 trillion yen), (2) technology for reducing the environmental load and related products (200 million yen), and (3) effective use of resources (10 trillion yen). Among these, equipment and

tools account for nearly half.

The barriers to market entry are considered to be low, as there are many niche fields and a high availability of mature technology.

② Factors Preventing Market Expansion and Challenges

This industry also faces many challenges. In the area of social systems, a society-wide recycling system has not yet been established and there is a shortage of waste disposal sites. In the area of market systems, there are problems involving price competition and

5.3 Challenges Drawn from the Examples and New Market Creation

Measures for dealing with new market creation and new business formation will now be discussed based on the characteristics extracted from the above examples, the results of investigations concerning promising products in each segment, and interviews of companies involved with these products.

The ultimate beneficiaries of the above-mentioned three industrial segments: "health and welfare equipment," "medical equipment," and "environmental equipment," are the Japanese people. The ultimate goal of these segments is to make the citizens' lives more comfortable and affluent. The close relationship of these business segments with people's lifestyles, therefore, makes them all the more important, and they will develop further based upon this close relationship.

These industries have, however, just begun to sprout in Japan. While each industry has a

increasing waste disposal costs. There are also problems concerning tightening regulations for dioxin control and the Container and Package Recycling Law.

In order to cope with these situations, it will be necessary to develop applications for the existing systems and to construct new systems. Reduction of environmental costs should be urgently undertaken. It may be necessary to tighten regulations and strengthen institutions in some cases. Furthermore, in order to expand the business, it is important for the supply side to enter into the area of services, not limiting itself only to equipment.

long history itself, of course, it is no exaggeration to say that the market for products and services is newly established and that the mechanism of competition has also come into play just recently.

To begin with, it is most important to meet domestic demand. Having said this, however, given the present globalization and borderless trends, markets and operations will not be limited to Japan. It is a challenge for Japan for these industries to be developed and for each segment and every company to gain international competitiveness. Japan must therefore address the need to propel its areas of strength, while identifying its weaknesses and strengths. The individual companies must make efforts of course, but the surrounding environment should also be improved.

So far, the problems these three industrial segments face have been identified from the macroscopic viewpoint. Companies involved in each segment have been interviewed to extract

the problems, including the above. Those interviewed to extract the issues confronting these segments included the following: from the health and welfare equipment segment, electronic three-wheeled or four-wheeled vehicles and life watch systems; from the medical equipment segment, biochip and CR (contract research) operations in R&D for pharmaceuticals; and from the environmental equipment segment, water (quality) equipment and consulting and services. The results obtained from the interviews have been categorized into five points. ①Few new business startups will serve as main players in the new market and new business. Even though there will be some new players, they will not be successful. ②Although there are seeds (technologies), they have not been fully developed into actual businesses, and new markets will thus not be created. ③There are limitations in the ability to deploy existing products. ④The direction of demand has not been clearly grasped. ⑤Due to the existence of antiquated business practices and customs, regulations have been retained and harmful effects generated. The details of these problems with specific examples will be discussed below, and measures to solve them will be proposed.

(1) Venture Business Promotion and Creation of New Business

In order to start a new business in Japan, the people concerned have to deal with such problems as financing, marketing and securing human resources – problems related to the three major resources known as “human, products and finance.” At the same time, due to the poor

surrounding environment (including the people’s attitudes), new businesses as a whole are not successful. While although various support systems have begun to be established, there are still very few companies which have well-organized business plans incorporating their own technologies and services, and these companies tend to miss opportunities (see “Actual situations and challenges in creating and nurturing venture companies,” 2002, Economic Research Institute, the Japan Society for the Promotion of Machine Industry, pp. 3-4).

In order to create new markets – regardless of the form of business, whether as a venture business or a new business – a supply chain structure must be created. First of all, creation of a new business should be realized. Once a new business has been formed, creating a structure for smooth business operation becomes important. In any case, efforts by the company or the entrepreneur himself are essential.

The entrepreneur must act according to the following philosophy, in particular. “position the company objectively and possess the philosophy-based management mindset;” “display strong leadership and implement role-sharing by division;” “clearly express the scope of the company’s business and its competitiveness;” “understand that technology and management are the two wheels of a car;” and “utilize outsourcing to cover shortages of resources” (see “Investigation and research concerning the creation, formation, and support of venture businesses in Japan,” Economic Research Institute, Japan Society for the Promotion of the Machine Industry, 2001, pp. 83-85).

Company A in the medical equipment sector was founded in April 2001 for example, utilizing an intra-company venture project offered by a major consumer electronic company. Company A was established, first of all, with a solid foundation philosophy and sound business plan. Based on the technological seeds developed by the major consumer electronic company, Company A envisages applying electronics technology to the area of biotechnology by entering the business of contract development of measuring and analytical devices. This is a niche business field into which the major electronic companies have not entered. Because of this division of labor and well-balanced coordination between the technical and sales divisions, Company A is expected to grow further in the future.

On the other hand, various challenges have also surfaced in the operation of these businesses. The health and welfare equipment sector, for instance, the company B newly developed a "life watch system" applying its own sensor technology. Although the company successfully raised the level of both technology and products, it has now been forced into a fierce sales competition, and it has been competing with famous, major companies in identifying new sales channels, ever since its inception, due to the immediate entry of major companies into the field. Meanwhile, Company C entered this field through joint development with a partner. Company C was eventually deprived of all the relevant technologies by that major company and was forced to withdraw from the field.

For new venture companies, an ability to convert major companies into entities that are

beneficial to the company's own growth, either as a ①rival, as a ②partner, or as a ③joint developer in the competition to acquire markets, will certainly be the key to success.

According to a past survey concerning which entity (organization) was useful in acquiring knowledge and know-how at the time of starting a business, the respondents replied that "friends," "business partners" and other familiar people, "universities" and "success models (those that have already achieved success)" in the same industry were most helpful. A similar trend continues even after the startup to the current time (See "Present situation and challenges of support activities for creation and nurturing of venture businesses," 2000, Economic Research Institute, Japan Society for the Promotion of the Machine Industry, p. 90).

For a venture company or a small organization to be created and fostered successfully, efforts by the company and collaboration with various organizations are essential. Collaboration activities centering on seeds technologies will be discussed in following section

(2) Collaboration among Strategic "Intellects"

State-of-the-art technologies, new technologies created by combining various single technologies, and other new types of technologies have appeared in recent years. These completely new technologies represent the results of basic research conducted by universities and other research institutes. There are numerous obstacles to be cleared, however, before these technologies can be commercialized. For instance, these technologies take a

considerably long time for development. At the same time, applicability, reliability, economic viability and other aspects should be considered from various angles before commercialization.

Meanwhile, in order to commercialize the frontier technologies and enable them to support viable businesses at the earliest possible time, venture projects initiated by universities and research laboratories are expected to play a major role. The more advanced the technology, the more effective the collaboration between a venture business and a research organ becomes as opposed to the venture business conducting the project alone. In other words, strategic linkage of intellectual assets will enable the creation of new business.

This "linkage of the intellect" would not work, however, if were left as it is today. Company D, for example, used to be a company mainly engaged in plating of electronic parts. The company once undertook production of parts for gene amplification equipment. With this experience as a stepping stone, the company embarked on the bio-medical field and succeeded in developing a special chip which can read DNA combinations employing electrical changes. The company entered into collaboration with a research body and has ascended to a position in the top group in this field. Nevertheless, the product has not yet found a suitable sales channel. In fact, the research is financed by its traditional business. Because it has placed too greater an emphasis on R&D, which has resulted in a funds shortage, and directed insufficient efforts to market exploration, the company cannot foster its flagship technology into a viable business.

There are several challenges, including that revealed by the above case, facing the current industry-academia collaboration schemes: (1) neither the research body nor the company is fully aware of the other's situation; (2) no full proprietorship of research results and no solid foundation for business has been established (e.g. the research body should be aware that a patent application is mandatory before presenting the research results at an academic conference, and the researchers should clearly understand the business objectives of the research and examine its business potential); and (3) licensing schemes are not sufficiently utilized for dissemination of the research results.

Company A, mentioned earlier, responded differently to these challenges. The company conducts projects jointly with a software company and a university in the United States, which supplement Company A's technologies. Customer information obtained through sales activities is fed back into the development process. Members of the sales force, who are well versed in the biotechnology fields, meet directly with the university researchers on a regular basis, and the information obtained is translated into specific development targets. These targets are then handed over to development staff so that solutions can be found. Once solutions are arrived at, they are returned to the researchers, a process that helps build a relationship of trust between them. The establishment of this trusting relationship seems to lead to success.

In order to solve the aforementioned problems therefore, the following methods are needed: ①securing and developing human

resources, ②prioritizing R&D outlays, ③clarifying the proprietorship of research results, ④promoting licensing, ⑤creating products and technologies based on the research results and customer needs, from a long-term, continuing perspective.

3) Changes in the Existing Products Needed

Since there are limitations to deal only with existing products or existing product development concepts, changes are needed.

The addition of high value to existing products is taken for granted. In addition, the following changes could possibly be introduced: from barrier-free to universal design in the product design concept; from single-purpose to multi-purpose use; new types of functions, such as packaged or with services; and an expanded product range (software and services integration). New possibilities are expected to emerge from such changes.

One of the fastest-growing product segments in the health and welfare equipment market in recent years is electric three-wheeled or four-wheeled vehicles. Since target market demand is limited, the market will soon become mature, if the present concept is maintained. They will not, moreover, be able to compete with cheap imports. Companies are not only adding more value (e.g. improved lever operability, added pre-recorded voice guidance, new options such as cane holders or rain proof ceilings) to their products, but they are also developing services and software for products to enable provision of human-oriented pre-and after-sales service. The target user range is being enlarged, furthermore, to incorporate elders who have

relative autonomy of mobility, as well as younger people.

One of the fields in which market growth is expected in the environment equipment segment is the information-oriented service sector. This sector provides information and know-how concerning environmental protection, including those associated with equipment, to companies, local governments and the general public. Company E, for instance, is a leading company undertaking environmental business for a long time. The company established an Environmental Business Department in 1990 with the aim of strengthening its environmental engineering business. It now deals with water treatment plants, environmental plants, chemicals, and alternative energy. The company considers that these environment-related engineering businesses are only possible as a result of integrating cross-sectional technical capabilities and involving itself in total, wide-scope technological development encompassing user needs, from manufacturing of equipment and apparatuses to consulting services providing not only hardware but also software. While attempting to improve its core technologies, i.e. water treatment, heat recovery, distillation and evaporation, exhaust gas treatment, heat decomposition, incineration and melting, and analysis, the company aims to help realize a recycling-oriented symbiotic society.

At the same time, the environment in which markets and businesses are created should also be changed. A total encompassment of such elements as continuous supply of products, collaboration of diverse fields, construction of networks, and sharing of

know-how is needed in this environment.

Supply requires demand. Demand must, therefore, be explored and created in the beginning; otherwise products and services will not be complete. To put it another way, those that cannot meet demand-side needs cannot grow. We shall elaborate on this in the following section.

4) Emphasis on Creating Demand

Demand-side analysis of the market is necessary in addition to supply-side analysis. Demand itself also needs to be created. Demand-based market exploration and a needs-driven industry can be established through transformation of the industrial structure to one that transcends traditional seeds-driven industry, i.e. an industrial structure in which technologies are created based on needs derived from the demand side. This transformation will unfold with the application of IT.

One example of demand-based exploration efforts by the supply side through an activities promoted together with the local community involves electric three-wheeled and four-wheeled vehicles. Local governments or shopping malls provide rental services for these vehicles for elderly visitors and handicapped people so that they can enjoy moving around the town. This idea is called "Town Mobility." Since it was introduced to Japan in 1996, the idea has been implemented in various parts of the country on a regular or experimental basis.

The "Life Watch" system is a quite interesting example of collaboration with a local community. Company F, for example, used to be

a manufacturer of industrial-use measurement equipment for. It embarked on emergency alarm system manufacturing with the aim of contributing to society. This is a system to inform the neighborhood of unwanted occurrences such as crimes, natural disasters, or sudden illnesses affecting the users. The difference between this system and conventional systems is that the alarm is first sent to the neighborhood so that neighboring people can rush for help, rather than waiting for the arrival of rescue units dispatched by the national or local government or professional service providers. Neighborhood people serve as the main providers of emergency rescue services in this system. "Meddling in someone's business," a benevolent custom of the past, is now incorporated into the system. This is a new model called a "fuzzy" security system in which the self-help efforts of residents play the central role, while the public sector provides secondary assistance. The company has been successfully exploring new demand utilizing its regional network. This will generate different merits, too. The dissemination of this security system can also help reduce public expenditures, including police patrolling costs.

In addition to the trends involving the final consumer goods, demand creation is also necessary in high-tech fields. Even seeds-led industries would be unable to grow into big industries without a close correlation with market (demand-side) needs.

(5) Strengthening the Supply-side Environment

Finally, we would like to emphasize the necessity of improving and strengthening the

environment surrounding the supply side (coping with institutions, regulations and practices) inside and outside industries.

In the industries taken up in this report, improvement of governmental regulations and institutions has played a certain role. In the health and welfare equipment segment, the Law Concerning Welfare Tools served as a trigger to ignite R&D and dissemination efforts. In this process, industries have been formed and trade associations have been established. This has helped to establish the concept of a market mechanism, which was never considered before.

In the area of medical equipment, the former Ministry of International Trade and Industry's "Industry and Technology Development Scheme" (conceived in 1993) and the former Ministry of Health and Welfare's "Science and Technology Master Plan" (1996) helped to promote creation of a basic research business. The project of promoting medical equipment R&D by the MHW Science Council (1997) is another example of legal and regulatory improvements promoted by government agencies. The "Medical Equipment Industry and Technology Strategies" introduced by the Industrial Competitiveness Conference (1999) and other similar industrial policies have also contributed to the development of this industrial segment. (See "Survey concerning the technological trends in medical equipment," Technology Investigation Div., General Administration Dept., Patent Office, 2001, p.8.)

As for the environment equipment segment, the characteristics of this industry in Japan are basically determined by "pollution control" initiatives. Regulatory and institutional

improvements to control environmental pollution have played a certain role in expanding the market. During 1990s, when full-scale market formation took place, legal improvements such the Recycling Law, the Revised Waste Disposal Law, and the Earth Summit (Agenda 21), the COP3 Kyoto Conference, served as "stepping stones" leading to specific regulatory and institutional improvements.

On the other hand, however, existing regulations sometimes get in the way. In some cases the same law encourages one industry while discouraging another. These regulatory and institutional improvements targeting the supply side were sometimes put into place ahead of moves by the actual players. The harmful effects of old business customs and practices, or forces that could not (would not) catch up with these developments, have begun to surface. (See "Investigation report concerning the medical and welfare industries in the Kinki region," Kinki Bureau of Economic and Industry, 2002.)

In the health welfare equipment and medical equipment industries, the principles of competition hardly worked due to a long-lasting era dominated by the "benefit grant system." With the introduction of the nursing care insurance system, the principle of competition has been partially introduced. High rental charges for care equipment and supplies, however, as well as fewer choices of items to be covered by insurance can be regarded as new challenges that have emerged recently.

Depending on equipment, moreover, manufacturers are required to obtain clinical data through collaboration with medical

institutions before getting authorization to produce the equipment. It takes too long to acquire authorization under the current Pharmaceutical Affairs Law. No matter how high grade (as well as high priced) the equipment may be, users will select cheaper, lower-grade equipment if the medical point is the same, under the current medical remuneration and point system. This is a harmful effect of the current institutional structure, which serves as a discouraging factor for new comers. Furthermore, a number of peculiar old business practices remain in the marketing of medical equipment, health and welfare equipment, and science equipment. These should be eradicated and other strange business practices should also be rectified.

Calls for eradicating the "hierarchical structure of administration" are continuously voiced in every industrial sector to strengthen the supply-side environment. Under the current system, regulations have been imposed by various sectional divisions of the bureaucracy. Certain companies have sometimes formed affinitive relationships with those divisions. These will hinder the growth of market according to a healthy, extended cycle.

In order to respond to these problems, deregulation and the concept of special zones for implementing structural reforms have taken shape as specific measures, resulting in the emergence of moves to transform the conventional system gradually.

There is a tendency in Japan, albeit less pronounced than in the United States, which allocates a huge budget to the NIH (National Health Research Institute), to place a higher

priority on R&D outlays in the frontier field of medical equipment. Furthermore, cross-sectional organizations, such as the Japan Medical and Technological Industrial Consortium (METIS) founded in 2001 for the purposes of fusing not only narrow-sense medical equipment but also broad-sense science, engineering and medicine, including biotechnology and information technology, of promoting industry-government-academia collaboration, and of facilitating broader collaboration encompassing the range from basic to clinical medicine, are finally beginning to advance on a full-scale basis.

Among other things, it is crucial to position these industrial fields with high growth potential as the centerpieces of Japan's national strategy. It is urgently necessary to strengthen the system to promote these industries by such means as establishment of a coordinator for cross-sectional integration and collaboration among government agencies; collaboration between industries and universities; prompt authorization of products; and a high-quality assessment system. Moreover, in order to create markets and assure the transparency and vitality of these markets, thereby establishing a structure of product supply in which open and free competition can be assured, the demerits of institutions, regulations and practices remaining on the supply side should be identified and rectified. At the same time, a thorough examination of the regulatory and institutional restrictions should be conducted as an urgent priority to adjust them to suit the current situation, either by reducing or strengthening the restrictions.

Chart 5-1 Features extracted from individual industrial segment

	Health and welfare equipment	Medical equipment	Environmental equipment
Possibilities of new markets, new products, and new businesses	This segment is expected to grow further, promoted by people's desire for higher quality of life, healthier and more positive social participation, and more reliable and safer society, in this age of rapidly aging society.		Expected to grow further promoted by the expansion of social needs and social diversification.
Market scale	1,100 billion yen (FY2000)	2 trillion yen (2000) (the national medical expenditures of the same period about 31 trillion yen)	The entire environmental business is of ¥24,700 billion scale (1997). Equipment business is expected to be an half of the entire size.
The industrial feature of Japan (and the comparison with overseas)	Predominancy of the U.S. and European countries. Japan has strength in some segments (transportation equipment, security alarm systems, barrier-free equipment, etc.). In the Japanese market, import exceeds export. Products and equipment such as lifts, stair elevators, chair holding equipment, are top ranking import items. Products and equipment requiring high technical capabilities (expensive items) are from Scandinavian countries, rehabilitation equipment and artificial limb are from Germany, low and middle priced items are from Asian countries, and transportation equipment and communication tools are from the United States. However, the dissemination rate of imported goods is still low (due to differences in lifestyle, social environment, the physical structure, high prices, and difficulties of after-sale service etc.).	U.S. has predominancy. Slow increase of exports from Japan and rapid increase of imports (export vs import: 820 billion yen vs 360 billion yen, 2000) has lowered the international competitiveness of Japan. Difference between strong fields and weak fields is large in Japan. Strong fields: endoscope, blood analysis, and diagnostic imaging based on such technologies as electronics, measurement, optics. Weak fields: high-end image diagnostic equipment (MRI, X-rays CT) and medical materials (pacemaker, catheters etc.) and other human body embedding type high risk products.	In Japan, this segment started from antipollution measures. Soon, it developed into resource-conservation and energy-saving measures, and to environmental protection measures. Pollution lawsuits, oil crises, global environmental problems, etc. have influenced the market formation. Breakdown of ¥24 trillion environmental business markets in Japan: (1) pollution control (¥14 trillion), (2) environmental load reduction technology and products (¥200 million), and (3) resource recycling (¥10 trillion). Equipment and product lineup corresponding to demands and markets of each country. However, strength of Germany is conspicuous in overall segment.
Factors promoting market creation and an expansion	The market expanded rapidly with an introduction of the welfare tools law in 1993. Also strong field based on related technology of Japan is also large.	Existence of Japan's strong segments with its advanced technology. Deployment based on the national strategy.	Closely related to increasing concern over environmental problems, to a new social system. Restrictions within the market and improvements in regulation, and institutions play a certain role.
The possibility of new entry to the market	Low barrier to market access (numerous niche fields, availability of mature technology). However, since a peculiar practice also remains, forerunner groups have an advantage.	High barrier to market access (high r technical capability needed, peculiar business structure within the industry).	A barrier is low (numerous niche fields, availability of mature technology, etc.).
Prohibiting factors and challenges	Extracted from the below.		
Social system	Lack of receiving and transmitting information.	Information disclosure is necessary.	Recycling system has not been established as a social system, and shortage of waste disposal sites.
Market system	Inflow of cheap Asia products, existence of expensive products, intensified price competition are the problems.	Increase of import, and existence of a peculiar dealership practice in Japan.	Intensified price competition, increase of waste processing costs.
Regulation and institutions	Strict equipment lease program under nursing care insurance system, and strict legal and regulatory restrictions. Heavy dependence on public subsidy by disable people.	Measures to restrain medical expenses under the medical insurance system.	Tightened regulatory restrictions on dioxin, and Container and Package Recycling Law.
Demand side	Awareness of consumers and users, concerns over demand expansion, difficulty of dissemination, unable to get direct reaction users in case of intermediary users.	Market exploration for not only medical institutions but also general consumers and end users.	Awareness of companies (between companies) and awareness of consumers or residents
Inside of a company (industry)	Deployment according to product features, necessity of networking, remained peculiar customs.	Necessity to increase efficiency and improve quality in medical treatment.	Searching domains that a company can deal with internally, strategic management, construction of a network connecting inside and outside the company (utilizing management resources).
Product segment	Limit of products only strategy, necessity to react one on one basis (especially for disabled persons)	Providing not only products but also leasing and other services.	Limit of product only strategy.
Specific products	Fields with high growth potential in the future which will grow into Japan's representative industrial capability. Fields which is expected to compete not only in domestic market but on a global scale. (1) Electric-driven three-wheeled and four-wheeled vehicles. (2) Life Watch System	(1) Biochip (2) CR business including pharmaceuticals.	(1) Water (Water Quality) rated equipment (2) Consulting and other services.
Problem extracted and measures to revitalize each segment	Product deployment according to market (demand) structure. Expansion of users from the elderly and disabled persons to wider targets (from barrier-free to UD). Deregulation for market exploitation. Establishing a system to receive and transmit information.	More aggressive entry to new fields. Utilization of IT system for increased safety and efficiency. Business-government-academic sector collaboration. Developing creative products through collaboration between universities which have excellent technological seeds and companies. Prompt authorization system and high quality assessment system. Flexible venture business training programs.	Expansion of business not only to equipment but also related services. Application of existing systems, and testablishment of a new system. Dealing with environmental costs. More tightened (strengthened) regulations or systems depending on a situation.

Based on various references. "Expectation toward New Markets and Problems of Dissemination" by Economic Research Institute, Japan Association of Machine Industry Promotion