

스포츠 기술정책을 위한 유망 스포츠산업 후보군의 도출 및 분석*

임 명 환[†]

한국전자통신연구원/과학기술연합대학원대학교

An Extraction and Analysis of the Candidated Promising
Sports Industries for National Sports Technology Policy

Myung Hwan Rim[†]

Electronics and Telecommunications Research Institute/
University of Science and Technology

■ Abstract ■

The sports industry is expected to develop into a huge business through convergence with existing industries such as the broadcasting/information communications, health/medicine, and entertainment/leisure. This paper aims to extract and analyse the candidated promising sports industries at the national level in order to promote them in the long term, and adopts a policy-based approach to such efforts. To extract promising sports industries at the national level, a methodology that considers economic effects such as global competitiveness, technological characteristics, and the creation of jobs, as well as technical development projects, should be adopted. In this study, It was extracted 59 candidated promising sports industries using literature review and expert opinions. As a result of in-depth survey, we found some critical implications each area as follows; health club operation in the lifetime and participation sports area, female sports dance in the welfare sports area, new material sports shoes in the lifetime and welfare sports area, and dynamic training system in the professional sports area.

Keywords : Sports Goods/Facility/Service, Technology Development, Policy

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† 교신저자, mhrim@etri.re.kr

1. Introduction

Despite some economic recession, sports have continued to thrive, with major events appearing to become more popular than ever. Sport as a growth engine is not only a leisure activity and good for your personal health, but it has a big industrial impact [2]. Therefore the sports industry will be further stimulated due to increasing income and leisure activities, and is expected to develop into a huge business through convergence with existing industries such as the broadcasting/information communications, health/medicine, and entertainment/leisure. According to PwC's report [13], North American sports industry revenue including gate receipts, media rights, sponsorship and merchandise will grow at a compounded annual rate of 4.8% to \$67.7 billion by 2017. As such, many nations are striving to promote their sports industries by integrating sports with science, conducting R&D to improve the athletic performance, and developing sports goods and facilities.

This paper aims to extract and analyse the candidate promising sports industries at the national level in order to promote them in the long term, and adopts a policy-based approach to such efforts. In other words, this study presents an analysis of how to extract and prioritize promising sports industries among the many hundreds of sports goods, facilities and services related to countless athletic events. Such efforts are aimed at preparing a rational procedure for the extraction of promising sports industries under the great national philosophy embodied by the 'effective usage of resources and the expansion of national welfare.' In addition, promising sports industries, when explored according to such a procedure, should be linked with national technology development program in order to

attain national economic achievements.

Generally, a promising industry may be acknowledged as a highly profitable industry; technically, however, the word "promising" is used to mean emerging, so a promising industry refers to an industry with high possibility of future development. Thus, a promising industry is defined as an industry with high profitability and high R&D investment ratio as well as high growth rate. Injected into the BCG matrix [14], a promising industry is either positioned in the star area, or it is moving to the star area from the question mark area. To discover promising industries among a large number of industries, those industries that have the conditions for being positioned in the question mark area should be explored; such explored industries should then be assessed to discern which of them can be positioned in the star area.

According to STEPI [7], in the mid- and long-term technological innovation strategy for fostering future leading industries, a future leading industry is defined as an industry that will be able to lead Korea's economy and create next-generation growth engines. In other words, a future leading industry is defined as an industry that offers huge business prospects along with high marketability and profitability as well as high technological competitiveness and big ripple effects on other industries; according to leading times and characteristics, it is categorized into main industry, next-generation strategic industry, and promising industry.

A promising industry is characterized by a new market that is starting to be formed generally due to "disruptive" technology and by belonging to the introduction stage of market growth stages. Besides a promising industry, even if it belongs to an existing industry, is diffe-

rentiated from the existing industry, and it has the following characteristics : all companies and technologies operating within the industry are in the growth stage, and it has high growth possibility and profitability; technological innovation progresses rapidly, and R&D rates in the relevant areas are high; it is very difficult to acquire information on customers and markets, and; it is difficult to forecast the market prospects such as market size and demand.

2. Material and Method

2.1 Concept of Methodology

To extract promising sports industries at the national level, a methodology that considers economic effects such as global competitiveness, technological characteristics, and the creation of jobs, as well as technical development projects, should be adopted. This is why, in the sports sector, international norms are applied to game rules, goods and facilities, markets are led by new convergence technologies, and sports industries should contribute to national economic growth.

General methodologies designed to extract promising industries include an analysis of the future needs of society, techniques for predicting the future, a questionnaire-based survey, a literature study, and an extract survey. However, since the sports sector comprises diverse events and a wide range of industries, Delphi [3] and In-depth [1] methods are considered suitable for the theme of this paper. The proposed procedure includes the following three steps : step 1 : the identification of candidates for promising sports industries; step 2 : the extraction of promising

sports industries; and step 3 : the analysis of extracted promising sports industries. With the definition of a promising industry and its characteristics, efforts to explore, derive, and select promising sports industries aim at achieving cost-efficient results using limited national budget.

2.2 AHP Analysis

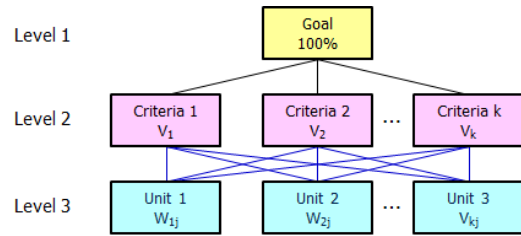
One of the methodologies designed to explore promising sports industries, AHP (analytical hierarchy process) is used to consider sports areas and their characteristics as mentioned in the surveys of experts and reflect the experts' subjective assessment. AHP is a hierarchical analysis/method or an analytical hierarchical process. AHP simplifies the decision making on complicated problems, thereby aiding in effective decision making; it is used in calculating weighting through pair-wise comparison by factor. In the 1970s, AHP was developed by Saaty [17, 18] in order to improve the US Defense Department's decision-making efficiency in arms control and disarmament. Later, AHP could analyze, decompose, and structure problems with similar human thinking system, allowing it to be used actively in decision making in public-sector investment projects. AHP divides the entire decision-making process into several stages, analyzes and interprets problems by stage, and reaches a rational decision, making it the most scientific and powerful decision-making method. Thus, AHP is widely used by government agencies, international organizations, research institutes, financial institutions, and consulting firms to judge and choose, measure and evaluate performance results, make decisions and deter-

mine policies, analyze and verify feasibility, coordinate and resolve conflicts, and integrate the group's decision making. AHP analysis has the following characteristics : structuring of complicated situations; integration of quantitative and qualitative factors and subjective and objective factors; integration of knowledge, experience, and emotions; derivation of scientific priority (weighting); verification of logical consistency; enhancement of the validity and objectivity of results; derivation of the group's rational decision making; analysis and verification of validity; coordination and addressing of conflicts between stakeholders, and; systemization of feedbacks.

AHP is superior to other analytical methods primarily because of its ability to integrate quantitative and qualitative analysis. If only mathematical techniques need to be used in order to establish comparison and evaluation items in R&D projects, they will work fine for problems whose results can be quantified. Note, however, that they will not work properly for projects such as space aviation development projects wherein the evaluation factors and results of individual tasks have highly multifaceted characteristics. Thus, determining the importance of diverse, possibly conflicting evaluation criteria and evaluation items requires a methodology that can offer an alternative method based on the subjective assessment by the relevant experts. AHP proposed by Saaty has the advantage of being able to use experts' qualitative knowledge in decision-making areas wherein qualitative analysis is difficult to perform in evaluating the weighting or importance of competitive factors.

AHP was further systemized by Liang [8] to

categorize the analytical process into five stages. Stage 1 clarifies the goals and derives important factors for evaluation by establishing the hierarchical structure for components.



<Figure 1> 3-Stage Hierarchical Structure

Stage 2 sets up a pair-wise comparison matrix like expression (1), whereas stage 3 derives the eigenvector and maximum eigenvalue.

$$A = \begin{bmatrix} 1 & \langle p_{12}, q_{12} \rangle & \dots & \langle p_{1k}, q_{1k} \rangle \\ \langle p_{21}, q_{21} \rangle & 1 & \dots & \langle p_{2k}, q_{2k} \rangle \\ \vdots & \vdots & \ddots & \vdots \\ \langle p_{k1}, q_{k2} \rangle & \langle q_{k2}, q_{k2} \rangle & \dots & 1 \end{bmatrix} \quad (1)$$

P_{ij} : lower limit value between I and j indices

q_{ij} : upper limit value between I and j indices

Stage 4 involves the consistency index value being calculated by Eq. (2); if the calculated value is under 0.1, consistency is considered established [17]. The final stage, stage 5, derives the weighting and priority.

$$CI = (\lambda - n)/(n-1) \quad (2)$$

CI : consistency index

λ : maximum eigenvalue

n : number of indices

Meanwhile, despite its many strengths, AHP has problems associated with the participating

experts' ability, accuracy of measurement, and reversing of ranking; to address such problems, research is being attempted. One of such attempts is Delphi-AHP wherein Delphi is applied to AHP. The Delphi method is one of the prediction methods designed to gather various experts' insights into the realization time and importance of future possible major industries and technologies, allowing it to be used in predicting scientific technologies [9]. In other words, the two methods, if combined, can ensure a more satisfactory, reliable result of experts' decision-making process. Moreover, they can in the process of decision making-minimize the negative conflicts among experts with different ideas [20].

2.3 In-Depth Analysis

As one of the methodologies applied in exploring promising sports industries, In-depth analysis is a qualitative research method designed to conduct In-depth interviews to get small-scale respondents' individual viewpoints on special ideas, programs, and situations [1]. In-depth analysis is used in exploring new issues or obtaining detailed information on individuals' thoughts and behaviors as well as in exploring promising industries pursued by governments and government agencies [16].

Research methodologies can take two approaches : qualitative and quantitative. Unlike the qualitative methodology, quantitative methods such as surveys and experiments-which quantify data, use diverse statistical techniques, and reach a conclusion-aim to generalize the expected results. As such, the quantitative methodology enables many people to participate easily in research as samples. On the other hand, the

qualitative methodology, instead of generalizing results, seeks to obtain In-depth understanding of one single issue, problem, or phenomenon and uses a few number of samples; it does not attempt to generalize results for the entire population. Qualitative data analysis and interpretation also use categorization, abstraction, comparison, and integration methods, which are not statistical methods. With the furthering of globalization of overall economies, demand for the customization of products for individuals is increasing, requiring In-depth understanding of consumers and further enhancing the popularity of qualitative research methodologies. Qualitative and quantitative methodologies have different goals but can be mutually complementary. Therefore, using the two methodologies in executing projects will yield efficient analysis. As such, complex research methodologies are increasingly being used. Generally, qualitative research such as focus group interview and In- depth interview are first conducted to obtain understanding of the overall issues before generalizing the corresponding results using quantitative research such as questionnaire-based surveys and experimental research.

There are qualitative research methods such as In-depth interview, focus group interview and projective technique, and ethnography; they are designed to identify not only the marketing and advertising needs for products but also social phenomena, demand trends, future prospects, and analytic characteristics. These qualitative research methods, unlike quantitative research methods aim at the In-depth identification of consumers' deep needs and complaints. In particular, In-depth interview is the most widely used. Such research methods are re-

viewed as follows :

First, In-depth interview is suitable for socially sensitive themes or issues requiring individual confidentiality. In-depth interview, vis- a-vis the focus group interview, involves conducting the respondent-researcher interview on a one-on-one basis. This method is used mainly for obtaining deeper understanding of issues or phenomena or for surveying socially sensitive issues or issues requiring individual confidentiality. Compared with the focus group interview, In-depth interview requires more cost and time but can help identify the motivations and reasons behind the diverse, complicated, sometimes incomprehensive consumer behaviors. For instance, In-depth interview is mostly used in identifying symbolic meanings reflected on the products and services used by consumers; nowadays, mobile carriers, based on In-depth interview, are endeavoring to understand the diverse symbolic meanings of mobile services sought by consumers. The US's RAND [15] research institute used the In-depth research method in evaluating the world's technological development and prospect by 2020 as well as scientific and technological capabilities by nation. It also selected 16 technological application areas designed to evaluate the social impacts according to global technological change trends and explored future promising technologies.

Second, the focus group interview is suitable for researching on consumers' responses to new products. Generally, the focus group interview is conducted for two hours by the moderator with 8~10 participants; this method aims to understand consumers' perception and preference or usage style for products and services. It is also used in deriving new product concepts

in the process of developing new products or in surveying consumers' responses to such derived new product ideas. For instance, if a beverage company in one nation, before entering another nation's markets, conducts a focus group interview among target consumers regarding the product image or drinking of herb tea, it can obtain meaningful results. The biggest strength of the focus group interview is that it enables the participation and interviewing of various people and enhancement of synergies among the participants; thus, unexpected results may be obtained. Still, this method depends greatly on the moderator, thereby possibly causing the interviews to be distorted by the interviewer.

Third, the projective technique is suitable for deriving inner motivation, belief, and attitude. To that end, this method, in the process of interviewing, uses psychological methods such as word association, sentence completion test, comic strip completion test, and storytelling to help consumers express their inner motivation, belief, and attitude. In particular, the word association technique is used when it is difficult to get socially desirable responses if a general survey is used. For instance, when consumers' perception of credit cards-using the word association method-is surveyed, many consumers are found to fear the abuse of credit cards. This can hardly be discovered using general surveys.

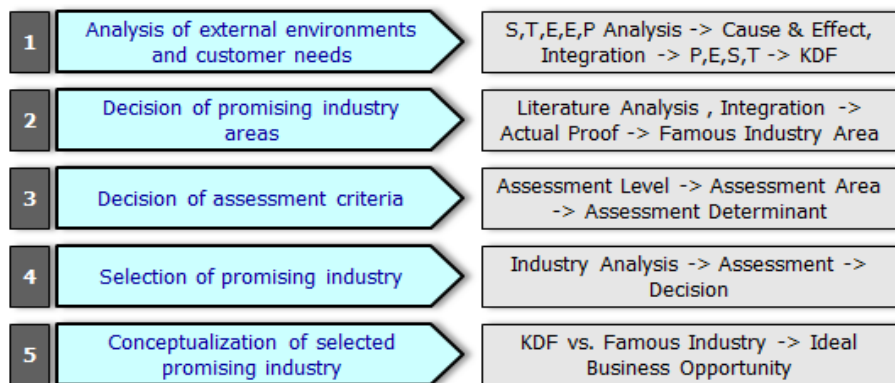
Fourth, ethnography is suitable for developing new products, promoting products, and understanding consumer cultures. Gaining popularity in recent marketing activities, ethnography is a research methodology originally developed by anthropology. As such, it aims to investigate human behaviors by observing them in the natural setting or interviewing people. This methodology

is used in developing new products, promoting products, and understanding consumer cultures, and it is very suitable for understanding consumers' total experience connected to consumers' activities of consuming products and services and the symbolic meaning thereof. Using the ethnography methodology requires skilled researchers and professional knowledge for analyzing data. It is being positively used in the US and other developed European nations. There are numerous marketing companies with experts in this methodology. Despite the need to use this methodology, however, South Korea has yet to secure professional human and material infrastructures [4].

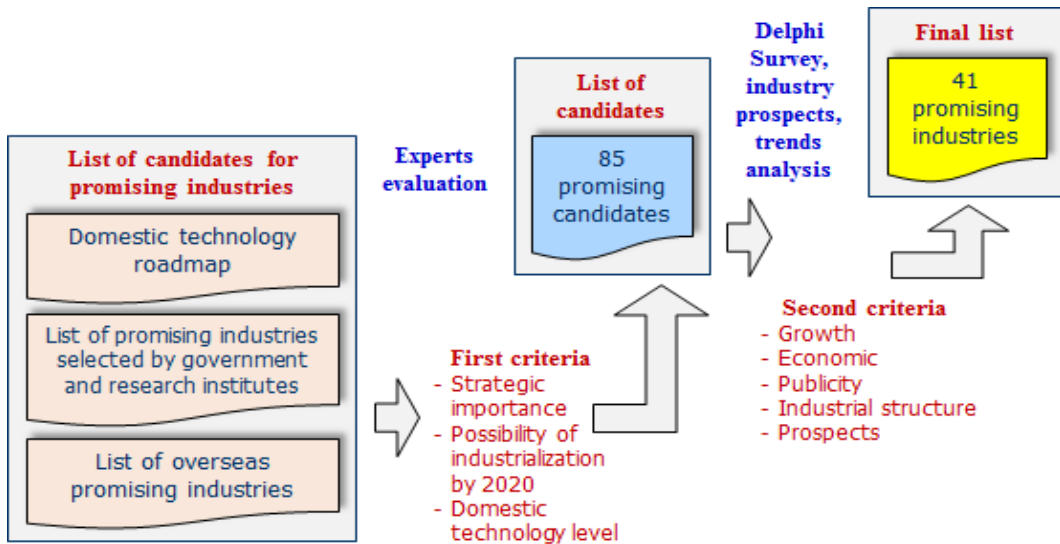
3. Case Study

Deriving promising industries at the level of corporations or governments is the output of taking comprehensive approaches including considering the external environments and internal capabilities, and diverse approach methods can be sought according to the explorers. Here are three (KISTI, KIET, MCST) cases of deriving promising industries.

KISTI (Korea Institute of Science and Technology Information) developed, systemized, and presented the process of selecting future promising industries with focus on external environments, which make establishing objective criteria relatively easy. KISTI's process of selecting future promising industries is different from existing methodologies in several ways. First, the existing vague environment analysis procedure reflects business type as a driving factor in the stage of embodiment thereof. Second, the process undergoes the procedure of putting together literature on existing promising industries and correcting it based on domestic evidentiary data and industrial analysis, thereby including both objective and subjective viewpoints. Third, the process, in the stage of evaluating prospects, organizes considerations such as evaluation area, evaluation level, and evaluation factor, quantifies the detailed evaluation factors, and tangibly confirms the results of assessing future prospects. Fourth, the process systemizes KISTI's experience in consultation with private companies—known as the project of exploring new promising business items—and focuses more on the practical approach to enable



〈Figure 2〉 KISTI's Process of Selecting Future Promising Industries



〈Figure 3〉 KIET's Method and Procedure for Deriving Promising Industries

easy utilization of research results beyond academic research levels, Fifth, selected promising industries are conceptualized as an ideal business for the purpose of commercialization [12].

To derive Korea's promising industries for 2020 [19], KIET (Korea Institute for Industrial Economics and Trade)-based on the domestic technology roadmap, list of promising industries selected by government and research institutes, and list of overseas promising industries-extracted 85 promising candidates according to the first criteria (strategic importance, possibility of industrialization by 2020, and domestic technology level). Then, based on the Delphi surveys, according to the second criteria (growth, economy, publicity, industrial structure, and prospects), 41 promising industries were derived. The finally selected promising industries include non-memory semiconductors, new bio-drugs, hologram navigators, solar cells, and service robots [21].

To enable Korea to join the ranks of the

world's five major sports industry technology powers, its MCST (Ministry of Culture, Sports, and Tourism) derived promising technologies aimed at fostering strategic R&D areas in the process of formulating the master plan for sports industry technologies [10]. Like technologies in other areas, sports industry technologies were assessed to reflect market demands by analyzing sales in sports industry area. As a result, 46 detailed sports industry areas were derived, from which 8 major technology areas were drawn [6]. To identify major sports industry technologies, MCST, through brainstorming by experts' groups, surveyed 21 original technologies in promising sports industries in connection with 8 major sports technology areas. Likewise, the similarity of the derived original technologies was analyzed to derive major technologies. The major technologies to be fostered were selected based on future leading original technologies aimed at the globalization of sports industries and creation of emerging markets as well as on

the high value-added convergence technology area. The procedure for selecting major technology areas involved taking the top-down approach. Specifically, the policy direction was set to enable South Korea to join the ranks of the world's five major sports industry powers; in line with the four major tasks to that end (original technology, convergence technology, creation of infrastructure, and utilization of technological achievements), six areas (sports measurement analysis technology, people-engaged sports ability enhancement technology, sophisticated sports goods material original technology, people-engaged life sports industry technology, and future market creation-type fusion leisure sports industry technology) were selected based on experts' discussions. These selected six sports industry technologies are more linked with policy goals considering the existing sports classification and market size (share, etc.) instead of being linked with promising sports industries.

4. Result and Discussion

4.1 Framework

To propose the procedure for deriving promising sports industries and selecting

strategic sports industries, this study sought to explore items related to promising industries based on the development of future sports industries and services to match them with the sports technologies achievable within the next 3~5 years. As a methodology for deriving promising sports industries, Delphi research surveys general public and sports experts in the relevant industries, universities, and research institutes to determine the values and acceptance from the user's viewpoint, marketability, possibility of embodying technology, and possibility of globalization. In-depth research surveys sports experts in industries, schools, and research institutes to determine the market invigoration time, market growth rate, industrial ripple effects, and major factors necessary for activating the future sports industries so that promising industries can be pinpointed.

In this study, global, prescriptive, social and business factors were considered in relation to sports industries, thereby predicting the industrial and technical aspects of the sports sector. And, based on cases of new industries and convergence trends, scenarios for future sports industries were established in order to identify 59 candidates for promising sports industries. Technology policies designed to promote sports industries need to

<Table 1> Classification of Sports Industry Policies

Category	Public Agencies	Private Companies	Individuals	Business Characteristics	Competitive Environments
Sports facility	●	◎	△	Rental business	Domestic competition, infrastructure levels
Sports goods	X	●	◎	Manufacturing business	Global competition, export competitiveness
Sports service	◎	●	◎	Service business	Brand, marketing, and management

Legend : ● Strong relationship, ◎ Moderate relationship, △ Weak relationship, X Irrelevancy.

systemize the classification of sports and to define the classification and scope thereof since sports events or industries are correlated with each other and are closely related to policy means. Also, sports industries were defined according to the official classification systems of facility business, goods business, and service business in terms of the relationships among public sector, private sector, and individuals and in terms of business characteristics and competitive environments.

In terms of the demand aspect, policies were classified by beneficiary into professional sports, participation sports, lifetime sports, and welfare sports; thus determining the policy goals and support types.

The extracted 59 sports industry as a promising candidates to evaluate in-depth survey of two parts of 2 months (January–February 2014) was performed. Part 1–A contained 21 lifetime sports and participation sports(facilities and services business) with the criteria of health/hobby, achievement/satisfaction, and market/economy. Part 1–B evaluated 7 welfare sports with the criteria of welfare/benefits, hobby/health, and achievement/satisfaction. Part 2–C included 18 lifetime sports and participation sports (goods business) with the criteria of marketability and export/global competitiveness. And Part 2–D investigated 13 professional sports with the criteria of technological superiority, sports performance, and global market competitiveness.

〈Table 2〉 Classification of Policies on Sports Beneficiaries

Category	Professionals, National Representatives	Amateurs	Common People	Disabled People, Women	Policy Goal	Support Type
Professional Sports	●				Breaking records, winning medals	Direct, indirect
Participation Sports		●			Achievements, satisfaction	Indirect
Lifetime Sports			●		Hobbies, health	Indirect
Welfare Sports				●	Benefits, welfare	Direct, indirect

〈Table 3〉 Classification of Sports Industry, Technology, and Policy

Industry	Promising technology	Policy	Direction for linkage
<ul style="list-style-type: none"> • Sports goods • Sports facility • Sports service 	<ul style="list-style-type: none"> • Sports information technology • Sports environment/facility technology • Sports material technology • Performance enhancement technology • Welfare sports technology • Sports physiology/medicine technology • Exercise dynamics technology • Sports measurement/performance technology 	<ul style="list-style-type: none"> • Industry promotion • Technology development • Technology standardization • Settlement infrastructure • Human resources training 	<ul style="list-style-type: none"> - Promote the concept of the future-oriented sports industry and reflect it on the technology and policy - Embody detailed industries to allow sports goods and services to flow seamlessly from manufacturing to distribution - Match original technology that enhances the technical competitiveness of the relevant industries - Ensure policy implementation results to foster sports industries

Note : Based on the special classification of sports industries (MCST, 2012).

〈Table 4〉 The Results of In-Depth Survey for the 59 Candidated Promising Sports Industries

Rank	Candidated promising sports industries	Total Score	Evaluation Index and Score		
			health/hobby	achievement/satisfaction	market/economy
Part 1-A	Lifetime sports and Participation sports (Facilities and Services business)				
1	Health club operation	11.41	4.16	3.79	3.46
2	Table tennis, tennis, racquetball, badminton, etc.	11.25	4.02	3.84	3.39
3	Building and operating of bike paths and facilities	11.13	4.11	3.64	3.38
21	Windsurfing, hang-glider, etc.	8.66	3.07	3.04	2.55
Part 1-B	Welfare sports		welfare/benefits	hobby/health	achievement/satisfaction
1	Female target sports (yoga, aerobics, sports dance)	11.54	3.91	3.84	3.79
2	Elderly and disabled targeted rehabilitation industry	11.50	4.00	3.77	3.73
3	Elderly targeted sports (yoga, aerobics, sports dance)	11.38	3.96	3.80	3.79
7	Manufacture of special disability sports facilities	10.00	3.61	3.20	3.20
Part 2-C	Lifetime sports and Participation sports (Goods business)		Marketability of Lifetime sports	Marketability of Participation sports	Global export competitiveness
1	State-of-the-art sports shoes	11.31	3.58	4.04	3.69
2	State-of-the-art sports clothing	11.21	3.50	4.06	3.65
3	General Sports Clothing	10.92	3.73	3.85	3.35
18	Water sports equipments such as yacht and canoe	7.94	2.40	3.02	2.52
Part 2-D	Professional sports		Technological superiority	Sports performance	Global market competitiveness
1	Biomechanics and physical information-based training system	12.21	4.12	4.27	3.83
2	State-of-the-art sports clothing for professionals	12.08	3.92	4.19	3.96
3	Statistical services of sports history analysis	11.75	3.98	4.17	3.60
13	IT-based sports marketing services	10.23	3.35	3.33	3.56

The questionnaire was distributed to 236 expert people in the field of sports and we collected the 56 (19.4%) of Part 1 (A, B) and 52 (18.1%) of Part 2 (C, D). The frequency of collected questionnaires was as follows; universities 35.7%, research institutes 17.9%, companies 8.9%, no answer 37.5% in Part 1, universities 38.5%, research institutes 19.2%, companies 5.8%, no answer 36.5% in Part 2. The results of in-depth survey are summarized as follows. The “health club operation” showed the highest effects among the 21 lifetime sports and participation sports of Part 1-A. The “female target

sports (yoga, aerobics, sports dance)” was the most contributable among the 7 welfare sports of Part 1-B. The “state-of-the-art sports shoes” had the highest score among the 18 lifetime sports and participation sports of Part 2-C. The “biomechanics and physical information-based training system” showed the highest competitive among the 13 professional sports of Part 2-D.

5. Conclusion

The sports industry paradigm is expected to

shift from sports policies designed for the elite, with the focus on professional champions, the acquisition of medals and the renewal of records, to widespread public participation, the achievement of high-value added, the creation of new sports combined industries, and the promotion of national welfare. Therefore, the extraction of promising sports industries in line with such a paradigm shift, the selection of strategic sports industries in accordance with the classification of sports policy goals, and the development of core technologies could provide a significant boost to national competitiveness. This paper is focused on extraction and analysis of the candidate promising sports industries; however, the next study should, once a rational procedure has been established, select some strategic sports industries as a national growth engine. And then research institutions have to execute a national sports technology program matched with the selection of strategic sports industries.

Meanwhile, to fulfill policies for selected promising sports industries, technology and policy should be linked together. R&D authorities (research institutes, universities, and companies) are exploring promising sports industries according to their respective purposes and conducting R&D. Thus, at the state level, industry [5], promising technology [11], and policy should be linked together to present visions and strategies; policies should be devised to prevent duplicated investments and to enhance technological competitiveness. These efforts are required to ensure the consistency and continuity of policies on sports industries, and the connectivity of promising sports areas should be pursued under the official or rational classification system for industry, technology, and policy.

References

- [1] Carolyn, B. and P. Neale, *CONDUCTING IN-DEPTH INTERVIEWS : A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input*, Pathfinder International, 2006.
- [2] European Commission, Sport keeps not only you, but also industry fit. MEMO/14/35, 2014.
- [3] Hsu, C.C. and B.A. Sandford, "The Delphi Technoque : Making Sense of Consensus," *Practical Assessment Research and Evaluation*, Vol.12, No.10(2007), pp.1-8.
- [4] Jeon, S.-W., *Overview of Qualitative Marketing Research Methodologies and Case study of Marketing Fields Applications*, Advertising Trends, 2009.
- [5] KISS (Korea Institute of Sports Science), 2012 Survey of Sports Industries, 2012.
- [6] KSPO (Korea Sports Promotion Foundation) and MCST (Ministry of Culture, Sports and Tourism), Formulation of 2012 Master Plan for Sports Industry Technologies, 2012.
- [7] Lee, J.W., *Innovation Strategy for the Development of the Leading Industries in the Next Generation*, STEPI (Science and Technology Policy Institute, 2003.
- [8] Liang, W.Y., "The Analytic Hierarchy Process in Project Evaluation : An R&D Case Study in Taiwan," *Benchmarking : An International Journal*, Vol.10, No.5(2003), pp.445-456.
- [9] Linstone, H.A. and M. Turoff, *The Delphi Method : Techniques and Applications*, Addison-Wesley, Publishing Company Advanced Book Program, Reading, Mass, 1975.
- [10] MCST (Ministry of Culture, Sports and Tourism), Cultured life, Happy Korea, 2013

- Business Plan.
- [11] MCST (Ministry of Culture, Sports and Tourism), Special Classification of Sports Industries, 2012.
- [12] Park, C.-G., E.-S. Kim, D.-E. Park, and K.-M. Seong, "Development and Systematization on the Selection Process of Future Promising Industries," *KISTI*, 2004.
- [13] PwC (PricewaterhouseCoopers LLP), Outlook for the sports market in North America through 2017, 2013.
- [14] QuickMBA, *BCG Growth-Share Matrix*, Strategic Management, 2010.
- [15] RAND, *Global Technology Revolution 2020*, Technology Trends and Cross-Country Variation, 2006.
- [16] Rim, M.-H., Y.-J. Park, and P.-S. Heo, "A Study on the Decision and Selection of the Star Contents in the Convergence Era," *Journal of Information Technology Applications and Management*, Vol.18, No.2 (2011), pp.1-21.
- [17] Saaty, T.L., "A Scaling Method for Priorities in Hierarchical Process," *Journal of Mathematical Psychology*, Vol.15, No.3(1977), pp.234-281.
- [18] Saaty, T.L., "How to Make a Decision : the Analytic Hierarchy Process," *European Journal of Operational Research*, Vol.48, No.1 (1990), pp.9-26.
- [19] Song, B.-J., M.-T. Jeong, Y.-S. Oh, B.-C. Ha, and Y.-J. Choi, *Korean Industrial Vision 2020 for Promising Sectors*, KIET (Korea Institute for Industrial Economics and Trade), 2006.
- [20] Tavana, M., D. Kennedy, and P. Joglekar, "A Group Decision Support Framework for Consensus Ranking of Technical Manager Candidates," *Omega*, Vol.24, No.5(1996), pp.523-538.
- [21] Yu, Y.-S., G.-D. Shin, Y.-K. Lim, and J.-G. Hong, *A Study on the Promising Future Industry of Gyeonggi-Do and its Policies*, Gyeonggi Research Institute, 2012-60, 2012.