

A Study on the Optimization Plan of Online Manpower Registration System of Korean Olympic Committee Focusing on Athletes Instructors and Referees

¹Mi-Suk Kim and ²Il-Gwang Kim

¹Korean Institute of Sport Science (KISS), Department of Sports Policy,
727 Hwarang-ro, Nohwon-gu, 01794 Seoul, Korea

²Department of Leisure Sport, 1239 Yangjae, Songpa-gu, 05541 Seoul, Korea

Abstract: The present status and problems of KOC's online manpower system and improvement measures for solving such problems were presented in this study. Literature research and expert interview were carried out in order to draw measures to improve the the Korea Sports Council human resource management system. The number of athletes and instructors registered on the KOC is 122,468 athletes and 23,019 instructors as of 2014 and the online manpower system targeting athletes and instructors was established in 2004 after the pilot project in 2003, improving the efficiency in the athlete registration task and reinforcing the systematic instructor's history management and utilization of instructor manpower pool. However, the system which creates and assigns an athlete number is being operated due to the ban on the collection of resident registration number according to the Personal Information Protection Act. Various problems on the online system including error in the classification of different people with the same name due to ban on the usage of resident registration number, need of establishing and operating the manpower system for referees, automation, systematization and integration of athlete's competition record and performance management were raised. For the efficient and effective use of the human registration system, the Korea Sports Council should build information integration functions such as eliminating the possibility of leakage of personal information, smooth communication between characters, eliminating errors in the system and building the latest ICT equipment.

Key words: Korean Olympic Committee (KOC), registration information system, manpower management, Amateur sports, Personal Information Protection Act, athletes

INTRODUCTION

In 2003, KOC promoted the master plan of administration network in order to establish manpower information targeting athletes and instructors throughout the country. The computerization of athlete and instructor registration information was carried out through the 1st pilot project and the system operation was started in 2004. The athlete and instructor administration network for input of source information of athletes and instructors, processing of civil applications (issuing of proofs and certificates), confirmation of target participants for the National Sports Festival and handling of various status and statistics tasks was established based on the administration network of 66 central sports associations under KOC.

KOC is a representative organization of Korean athletic circle that is in charge of 66 central sports associations and the number of registered athletes and instructors is 122,468 athletes and 23,019 instructors including 220 instructors for the national team in 45 sport entries as of 2014 (MoC., 2014). Until early 2000, KOC as

well as its affiliated central sports associations depended on hand-writing or a simple computer system for manpower information mostly.

Unlike the Korean government which promoted the implementation of electronic government in full-scale from the late 1990s, KOC drew up the plan of administration network for manpower management in 2000 which was behind the times. Especially, the number of participants for the National Sports Festival held in 2000 was more than 20,000 participants, raising the greatest demand on the manpower management system.

The establishment of online administration network on-line aims to provide prompt and accurate information service for policy making as well as registration and allocation of athletes per sport entries and games for the National Sports Festival as important preliminary data and it is an essential requirement for implementing the electronic government of Korea.

The purpose of this study is to review the composition and status of development tasks for the manpower information system development which is the basic information system for computerizing the

administrative information of KOC and 66 affiliated central sports associations, analyze the flow of tasks and improve problems occurred recently, contributing to the efficient system operation (KOC., 2004).

KOC's on-line manpower information system features the provision of prompt and convenient athlete-based service to allows domestic athletes and instructors to update and view their own information (athletes and instructors) anytime and anywhere without visiting an administrative agency for using the administrative information service. Also, this administrative information service changes the previous manual service to active service and provides various services to sports athletes as well as sports associations. KOC's athlete and instructor on-line manpower management system will also, include club members and referees (professional Amateur) in future, expecting to become the fundamental DB as the integrated system for all sports in Korea.

MATERIALS AND METHODS

Present status of KOC's athlete and instructor manpower management system;

Operation status of athlete registration and management system in early 2004: Before 2004, the inefficiency issue in the task had been raised continuously due to manual athlete registration. When the personal information of an athlete was changed, various problems including a long time required for modification process, double athlete registration issue due to lack of information sharing between member organizations, a long time required for inquiring athlete information due to the provision of information from application documents, notification required for the approval result of athlete registration and delay in status aggregate of various data occurred.

Therefore, the athlete registration and management system started operating in full scale from 2004 after the pilot project in 2003 intends to promote the convenience in sports administration through the systematic management and sharing of athlete information by standardizing regulations, document forms and registration task that were managed separately by 53 affiliated sports associations, centralizing athlete information on one place. Most of all, the main purpose of this system is to provide preliminary data to the National Sports Festival system and national team management system based on the registered athlete information.

The athlete registration and management system consists of 7 services including team information management, athlete and instructor information management, certificate management, statistics data management, affiliated sports association management and financial management and this system can provide

various permissions for usage according to users in 4 competent organizations including KOC, city and provincial sport councils, affiliated sports associations and city and provincial affiliated sports associations for necessary registration task service. In addition, officials from overseas branches who participate in the National Sports Festival also can operate the registration system (KOC., 2015).

This system also, allows athletes to check their personal information through internet and request various certificates such as the confirmation of athlete registration and career certificate of athlete conveniently. The relevant details are as shown in Fig. 1.

The key point for the operation of the athlete registration and management system above is the registration of personal information. The subject responsible for registering personal information includes an athlete (or team) city and provincial sports association, city and provincial sport council and central sports association and specific details are as shown in Fig. 2 and Table 1.

As mentioned above, athlete information registration process was complicated, civil complaints were raised for delay and especially information of thousands of athletes and instructors were entered by only a small number of managers in KOC, so that, the problem regarding input error was also raised at the same time. It was confirmed that the number of registered athletes in elementary schools, middle schools, high schools and colleges in 2004 was 82,167 athletes (MoC., 2014).

Therefore, each affiliated team was allowed to enter personal information on the system from the beginning as shown in Table 2 and manage information at integrated DB, enabling immediate confirmation of change in personal information, various statistics data, approval result for athlete registration, reduction of time to search athlete information and utilization of input data such as registration of athlete for National Sports Festival.

At this time, the menu contents of manpower system tasks through the registration of entered individual athlete and team information are as shown in Table 3.

The establishment and operation of athlete registration system in early 2000 was a major change in the information system of world of sports in Korea. The system was established for registering athlete (team) and instructor information as well as general status of affiliated associations (history organization, president, officials, status of officials advanced into international organizations, accumulated valid penalties, main projects, financial status, status of full-time staff members and regulations) and financial management (fund, revenue and expenditure, etc.) so that, it was possible to expect efficient management of manpower and organizations in the world of sports in Korea.

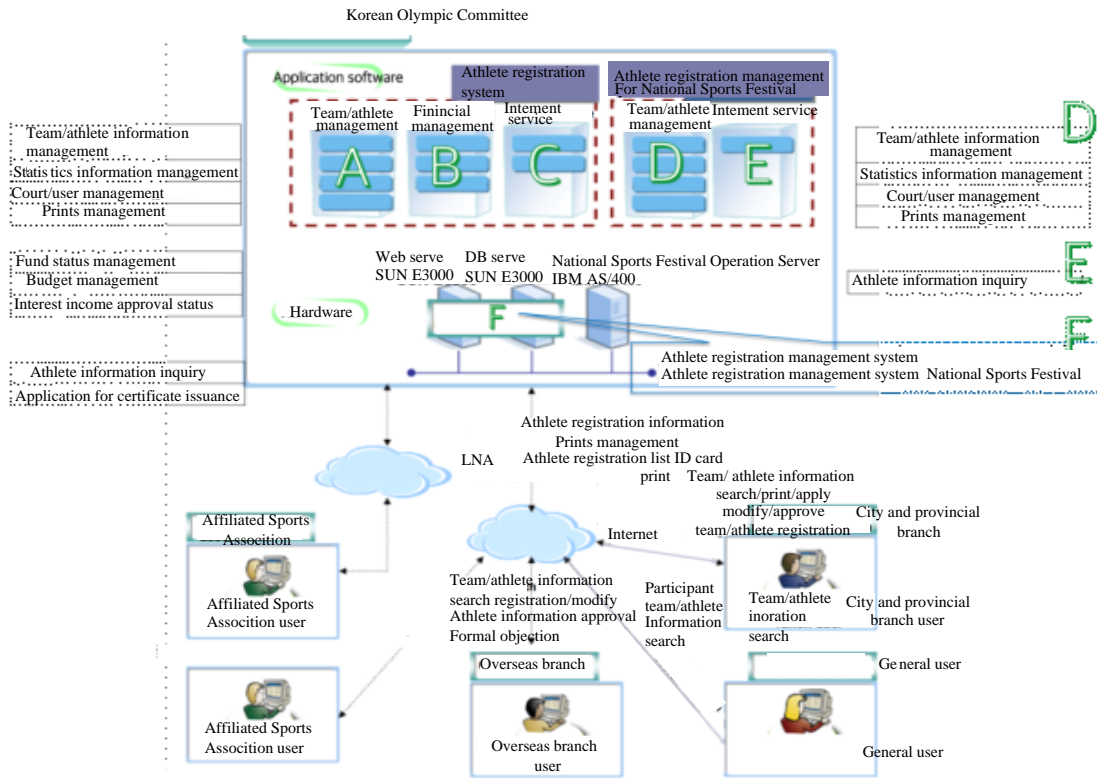


Fig. 1: Function model of manpower management system

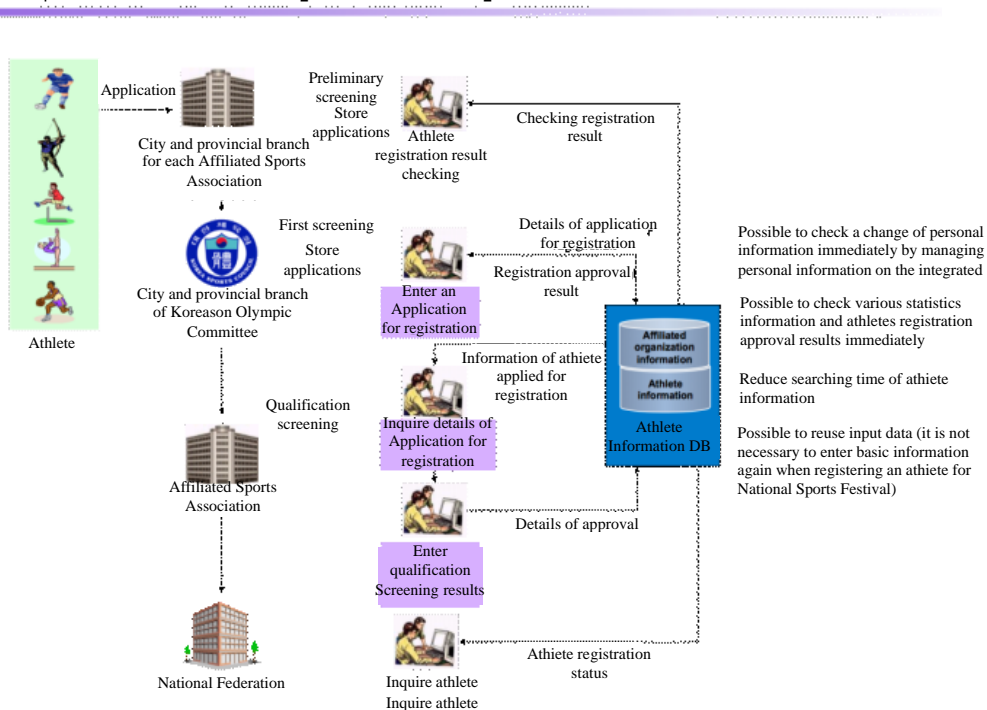


Fig. 2: Computer process of athlete registration

Operation status of athlete registration and management system after 2004: The establishment of manpower

management system contributed to the systematic and prompt management of manpower and organizations.

Table 1: Input contents and method of personal information for athlete registration

Subject	Contents
Athletes or teams	Click the athlete registration banner on the website of the relevant sports association (also available through the website of KOC) An athlete, or manager or coach of his/her team signs up for membership and logs in An athlete, or manager or coach of his/her team applies for athlete and instructor registration His/her team only prints out the application form for athlete registration (list of athletes per team) obtains official seal of school principal and submits it to the relevant City and Provincial Sports Association (no need to print a card for each athlete)
City and Provincial Sports Association	The administrator of sports information system accesses on the website of the relevant sports association (also available through the website of KOC) The athlete registration manager logs in The athlete registration manager confirms the contents applied by the team and approves or unapproves the contents The athlete registration manager obtains the official seal of Head of City and Provincial Sports Association the application form for athlete registration (list of athletes per team) and submits it to the relevant City and Provincial Sport Council * City and Provincial Sports Associations print out a card for each athlete and store originals
City and Provincial Sport Councils	The administrator of sports information system accesses on the website of the relevant Sports Association (also available through the website of KOC) The athlete registration manager logs in The athlete registration manager confirms the application form for athlete registration approved by City and Provincial Sports Association and requests the central sports association for final confirmation of registration The athlete registration manager obtains the official seal of Head of City and Provincial Sport Council on the application form for athlete registration (list of athletes per team) and submits it to the Central Sports Association
Central Sports Association	The administrator of sports information system accesses on the website of the relevant sports association (also available through the website of KOC) The athlete registration manager logs in The athlete registration manager confirms the contents of registration request from the City and Provincial Sport Council and finalizes the registration The athlete registration manager obtains the official seal of Head of Central Sports Association on the application form for athlete registration (list of athletes per team) and stores it Obtain the official seal only on the application form for athlete registration (list of athletes per) and submits it and print a card for each athlete and store it by City and Provincial Sports Association only for the purpose of storing originals for each step

Table 2: Modification details of athlete registration process

Classification	Old system	Improved system
Registration form	Prepared by the affiliated team (1 copy) on the system and prints	The affiliated team enters information
Confirmation of evaluation	Evaluation and system input by City and Associations Confirmation by City and Provincial Sport Councils Confirmation by Central Sports Associations	Evaluation by City and Provincial Sports Associations Confirmation by City and Provincial Sport Councils Confirmation by Central Sports Associations
System input	City and Provincial Sports Associations (utilize previous athlete information)	Athlete registration through website (athlete or affiliated team)
Athlete registration	Valid only for registration through the system	Valid only for registration through the system
Others	Use after applying for user account	Use after signing up for membership

Table 3: Tasks menu contents of manpower management system

Main function	Detailed function	Contents
Management team information	Register team information	Inquire and enter athlete's team information/Also available to enter club team information
	Register team officials	Enter information of representative, manager, coach and competent officials
	Register team's game record	When entering game record, it is possible select a team, inquire an athlete included in the selected team and enter information for the relevant athlete
	Inquire team history	Inquire team history, find officials and athletes included in the relevant year and move to the inquiry screen
	Print detailed team information	Print detailed team information and print additionally by putting an check mark on printing of history
	Print the list of members on the team	Print the list of members on the team for each registration year, affiliated city or province or sports entries
	Print the list of addresses of the team	Print the list of addresses of the team for each registration year, affiliated city or province or sports entries
	Print the list of athletes on the team	Print the list of athletes on the team for each registration year, affiliated city or province or sports entries
	Print the list of addresses of athletes on the team	Print the list of addresses of athletes on the team for each registration year, affiliated city or province or sports entries

Table 3: Continue

Main function	Detailed function	Contents
Athlete information management	Register athlete information	As the key function of athlete registration system, it allows to search a registered athlete using various conditions and register Registered athlete, non-registered athlete, register an athlete requested for registration Athlete's registration information consists of detailed information, education, record at the previously affiliated team, rewards and punishments, family particulars and game records Approval process for an athlete requested for registration is handled by the Administrator of Central Affiliated Sports Association
	Inquire an athlete's game record	Possible to inquire and enter an athlete's game record additionally
	Print detailed athlete information	Print an athlete's detailed information and print additionally by putting an check mark on printing of history
	Print the list of athletes	Print the list of athletes
	Print the list of addresses of athletes	Print the list of addresses of athletes
	Print athlete's registration card	Print an athlete's registration application form. It is possible to print for each team
Certificate management	Application for issuing of certificate	An athlete applies for issuing of certificate and inquires his/her application details
	Print the issuing status of certificate	Print the list of athletes applied for issuing of certificate
	Print a confirmation of athlete registration	Print a confirmation of athlete registration
	Print a career certificate of athlete	Print a career certificate of athlete
	Print a certificate of athlete's game record	Inquire, select and print an athlete's game record
	Print confirmation of team registration	Print confirmation of team registration
Statistical data management	Print a certificate of team's game record	Inquire, select and print a team's game record
	Manage statistical data	Create statistical data for detailed information of an athlete, team and general team and modify created information
	Print athlete/team registration status for each city and province	Print status of athlete and team registration statistics for each city and province
	Print general athlete/team registration status for each city and province	Print status of general athlete and team registration statistics for each city and province
	Print athlete/team registration status for each division	Print status of athlete and team registration statistics for each division
	Print athlete/team registration status for each division and for each city and province	Print status of athlete and team registration statistics for each division and for each city and province
Instructor management	Print detailed status of general team for each sports entries, city and province	Print detailed status of general team for each sports entries, city and province
	Register instructor information	Register and inquire instructor information
Management of Affiliated Sports Associations	Print the list of instructors	Print the list of instructors
	General status of affiliated sports associations	Register and manage general status for each Affiliated Sports Association on an annual basis General status is classified into history, organization, status of president, status of officials, status of officials advanced into international organizations, status of accumulated valid penalties, status of main projects, financial status, registration status, status of full-time staff members and regulations Enter and modify general status on each screen conveniently Print all registered general status together
Financial management of	Exclusive space for affiliated sports associations	Each affiliated sports association enters the weekly schedule of main events and main pending issues for each association Print entered weekly report items
	Fund status	Register, manage fund status for each Affiliated Sports Association and inquire establishment a pledge right or interest income status using various conditions Inquire and print fund status, status of pledge right establishment, interest income approval status
	Revenue status	Register and manage revenue status for each affiliated sports association (budget and account settlement) Print revenue status and financial independence status
	Expenditure status	Register and manage expenditure status for each affiliated sports association (budget and account settlement) Print expenditure status

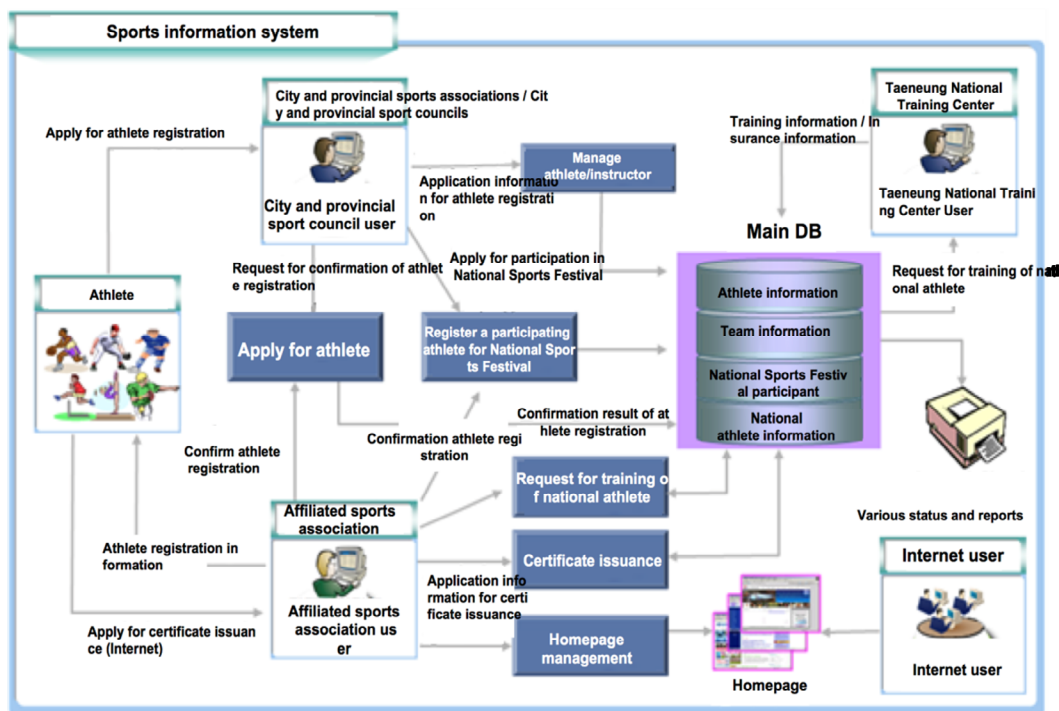


Fig. 3: Flow diagram of athlete instructor and sports information system (KOC., 2013)

However, problems regarding the operation of management system were also, raised due to rapid changes in the world of sports such as increase in the number of athletes instructors and officials in the executive office of sports associations increase in the number of domestic and international sports events and budget increase in financial expenses. In addition, a fraudulent act of an affiliated sports association forging game records and issuing a certificate while managing game records of athletes independently was caught (KOC., 2016a, b).

According to the result of special audit in art, music and sports fields conducted by the Board of Audit and Inspection of Korea in 2011, a sports association issued a certificate of forged game records which was used for the special college admission for student athletes, so that, a large-scale improvement on the previous record certificate issuing system was demanded. In addition, other problems such as vulnerability in the system security due to input of data by an athlete and his/her team and increase in unnecessary data due to registration of personal information of people other than athletes also, occurred. In order to strengthen the security vulnerability, the system which allowed athletes and their teams to enter data was established separately and the system was open only during the period of athlete registration, granting only users who signed up for membership qualifications for entering data and in order to prevent unnecessary data

increase, the screening function of city and provincial sports associations was reinforced as shown in Fig. 3.

Status and change of athlete registration and management system operation after 2014:

On August 2014, Personal Information Protection Act which prohibited the collection of resident registration numbers in the whole society including all public organizations and private businesses and required the destruction of previous collected resident registration numbers until August 6, 2016 was announced as shown below (Personal Information Protection Act, No. 13423)

“Article 24-2 (Restriction on Management of Resident Registration Numbers) of Personal Information Protection Act not with standing Article 24, Paragraph 3, a personal information manager shall keep resident registration numbers safely through the encryption measure in order to prevent the resident registration numbers from being lost, stolen, leaked forged, falsified or damaged. In such case, necessary matters with regard to subjects for application of encryption and application period for each subject shall be prescribed by presidential decree in consideration of processing size of personal information and effects in case of leakage (This Article Newly Inserted 2014.3.24., 2015.7.24.)

Even in cases where a personal information manager manages resident registration numbers under subparagraphs of Paragraph (1), he/she shall provide

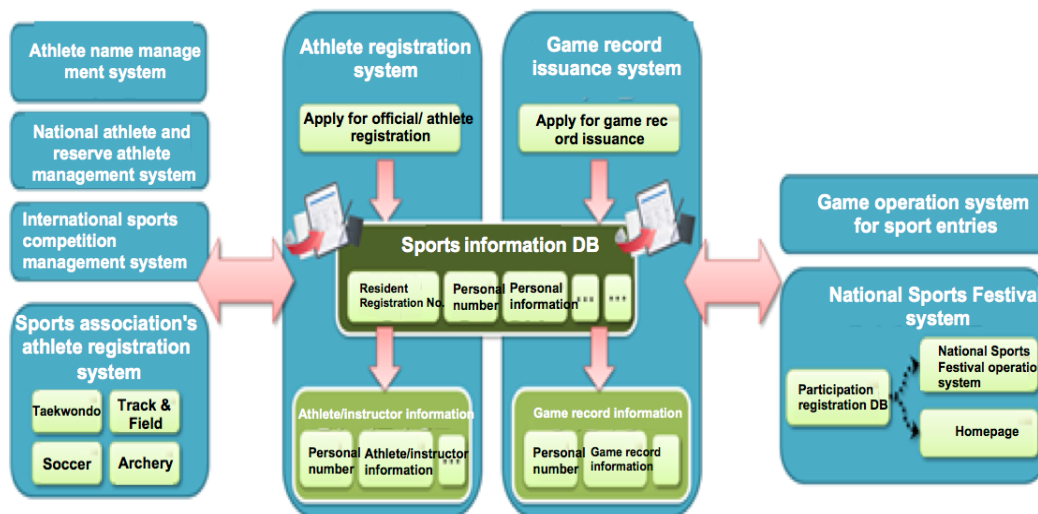


Fig. 4: Athlete registration system arrangement plan as a measure to replace the resident registration number

Table 4: Status of resident registration number linkage system

Classification	Contents
Game record issuing system	Linkage with resident registration number
National team and reserve athlete management system	
Athlete's name management system	
Game operation system for each sports entries	
National Sports Festival system (application for participation, operation of National Sports Festival, website (history))	
Athlete registration system operated by a sports association	
Taekwondo	
Archery	
Track and field	
Soccer	

methods for enabling subjects of information to join the membership without using their resident registration numbers at the stage of joining membership through internet website.

In the previous manpower registration system, the resident registration numbers were entered mostly as basic information as shown in Table 4, so, prior measures for this problem were necessary.

As stated above, KOC focused on the development of "Athlete number (athlete's unique number)" and improvement of unique number linkage between the systems as a measures to prohibit the usage of resident registration numbers according to the government policy. The athlete registration is the concept which is same as the resident registration to prove an elite athlete in Korea. When an athlete completes his/her athlete registration to the Korean Olympic Committee, he/she will receive his/her unique athlete's number. When he/she is registered on the athlete registration system as an athlete, he/she can issue various certificates and he/she can check his competition record, academic record, career as a

member of the national team and record in the previous teams immediately even after retirement (KOC., 2016a, b; Park *et al.*, 2003).

In addition, KOC reinforced the education regarding the observation of Personal Information Protection Act targeting sports association officials due to spread of social recognition on personal information. KOC also, set the direction of improvement to improve the security level of system user account, improve the management information notification and management function of sports associations, improve the function and errors of national team and reserve athlete management system and diversity the support of system usage and guide as shown in Fig. 4 (KOC., 2014a, b).

RESULTS AND DISCUSSION

Issues

Urgent problem of separate athlete identification according to the application of revised Personal Information Protection Act: This problem occurred due to the arrival of time of prohibition of collection of resident registration numbers under the Personal Information Protection Act (14.8.7.) and destruction of secured resident registration numbers (16.8.7). In other words when the resident registration numbers in the manpower registration system based on athlete and instructor information are deleted, it is impossible to check athlete and instructor information between KOC and affiliated sports associations through the linkage system. Of course, the athlete number is assigned but if there are different people with the same name there will be inconvenience that a staff in-charge should check the document personally again.

Excessive website usage due to registration of more than a half of 100,000 athletes and instructors during March and April every year: More than 100,000 athletes and instructors register information every year due to update of previous athlete and instructor information as well as inflow of new athletes and instructors. In addition, most of them register during March and April, so that, measures for differentiating the information input period separately for each affiliated association, region and target and additional manpower arrangement are necessary.

No utilization of referee registration system: KOC established the referee registration system in line with the previous athlete and instructor registration system in 2015 but they are very negligent in utilizing the referee registration system until now. Currently, there are 77,925 domestic referees and 2,901 international referees (MoC, 2014) but the referee registration and utilization are not operated.

It's because the responsibility for judge registration was assigned to each affiliated organization unlike the athlete and instructor registration. Most affiliated organizations lack ability to operate the system and most of all, budget cut for the judge registration system by the Korean Olympic Committee is considered as the main reason. Also, each affiliated organization entrusts the judge operation to the judgment committee, so, this is also, one of reasons that the judge registration system is not operated safely.

Increase in improvement requirements for internal and external systems: Many issues including demand of disclosing various status for each sports entries and association due to policies such as opening of public data increase in the request for modification of statistics data for each sports association and demand of diversification, needs of proper forms of statistics for increase in the recognized organizations and status change, error in the previous data printing technology (AI-Viewer) utilization function and many inquiries due to inexperience of sports association personnel in system usage have been raised continuously.

CONCLUSION

KOC's manpower registration system intends to promote the convenience in sports administration through the systematic management and sharing of athlete information by standardizing regulations, document forms and registration task that were managed separately by 66 affiliated sports associations, centralizing athlete

information on one place. Also, this system provides preliminary data to the National Sports Festival system and national team management system, contributing to the promotion of convenience and qualitative improvement of administration process to allow people to check information regarding sports manpower.

RECOMMENDATIONS

However, necessary measures to optimize KOC's manpower registration system in the field for the future are as follows.

First, it is necessary to eliminate a possibility of athlete's personal information leakage by applying the amended Personal Information Protection Act. It is necessary to reinforce the security inspection of Minister of Culture, Sports and Tourism (simulation hacking, etc), application of secure coding to the development system and data linkage safety of sports teams. And the database encryption, storing of access record, accredited certificate and real name verification should be applied.

Second, it is necessary to improve national reliability on the system by securing safety for user authentication of athlete and instructor without resident registration numbers.

Third, it is necessary to contribute to spread of clear sports administration and fair sports activities through the complete blocking of false athlete registration and false record issuance. In addition, it is necessary to reinforce the Personal Information Protection Act observation education for sports teams.

Fourth, it is necessary to improve business efficiency by improving the safety in sharing information between sports information system and linkage system and solving an issue of information management between user, working-level staff member and administrator.

For this purpose, provision of function to inquire and display the competition record registration details of an athlete on the screen issuing of performance certificate for each condition such as athletics meeting and period, provision of function to operate the customer center for providing an answer to user inquiry to each sports team, implementation of window function for requesting change of performance by athletes, implementation of issuing function by applying the certificate form for each sports team and implementation of real name verification, accredited certificate and consent of person under the age of 14 are included in terms of user. The periodic education should be carried out for personnel in charge of affairs to ensure smooth system operation in terms of working-level personnel. The satisfaction of legal implementation conditions with regard to the handling of

civil affairs, electronic signature for legal force of electronic document, implementation of function to compare the copy to the original for certificates through online, function to receive performance data in the athletic meetings, application of report tool to various reports for statistics management, measures to secure and operate server space for uploading documentary evidence and measure for settlement process of issuing certificates (handling of fee and expenses) should be considered in terms of administrator.

Fifth, it is necessary to improve the system utilization by increasing durable years of system and improving convenience of administrator through continuous upgrading of established systems. It is necessary to analyze internal and external requirements that may occur through proper business consultation in advance and improve the computer system function for sports teams accordingly.

Sixth, it is necessary to improve the sports informationization level initiated by KOC through the collection of requirements in political aspects such as opening of public data and practical aspects as well as affiliated sports associations. In other words, it is necessary to add the Korea Open Government License and information disclosure function for athletes and instructors, supplement the life-cycle judge monitoring function for judges and expand the athlete instructor and judge information integration function for sports team managers.

Seventh, it is necessary to prepare the basis for applying the newest ICT by reducing errors and risk factors in the sports information system. And the regular online and offline support system should be established to respond promptly for an unexpected problem in the site.

REFERENCES

- KOC., 2004. Improvement procedure of player registration procedure. Korean Olympic Committee, Seoul, South Korea.
- KOC., 2013. Internet game performance issue building master plan and systems. Korean Olympic Committee, Seoul, South Korea.
- KOC., 2014a. Korean Olympic committee: Sports information systems and personal data protection features advanced. Korean Olympic Committee, Seoul, South Korea.
- KOC., 2014b. Olympic committee: Referee registration system. Korean Olympic Committee, Seoul, South Korea.
- KOC., 2015. Computerization support program for the: Sports federation games. Korean Olympic Committee, Seoul, South Korea.
- KOC., 2016a. Maintain and manage the physical education information system of the sports federation. Korean Olympic Committee, Seoul, South Korea.
- KOC., 2016b. Registration application manual for athletes and executives of sports federation. Korean Olympic Committee, Seoul, South Korea.
- MoC., 2014. Sports and tourism. Ministry of Culture, Seoul, South Korea.
- Park, S.M., S.J. Kang and Y.R. Choi, 2003. Design for implementation of an online system for computer program registration. *J. Internet Comput.*, 1: 105-108.