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Research on the Development of SLA Indicators for Personal Information Protection of Public IT Maintenance Business

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공공정보화분야 유지관리사업의 개인정보보호를 위한 SLA 지표 개발에 대한 연구

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Abstract In the field of public informatization maintenance business, the attacks of external illegal users such as unauthorized leakage, destruction, and alteration due to intentional or inadequate management of personal information are increasing. In order to prevent such security incidents in advance, it is necessary to develop and quantitatively manage SLA indicators. This study presents the privacy SLA indicators and suggests specific methods such as information collection method and timing of the privacy SLA indicators. In order to confirm the validity and reliability of the proposed SLA indicators, an online survey was conducted with a group of experts. As a result, it was evaluated that compliance rate of personal information destruction and compliance rate of personal information protection system would be effective when applied to new and revised SLA indicators in terms of importance and validity. In the future, using SLA indicators for personal information protection as a standard for public information maintenance will contribute to improving SW quality and securing safety.

Key Words : Privacy, SLA, Public Information, Quality Management, Information Security

요 약 공공정보화분야 유지관리 사업에서 개인정보의 고의 또는 관리 부재로 인한 유출 및 파괴, 변조 등 외부 불법사용자의 공격이 증가되고 있다. 이러한 보안 사고를 사전에 예방하고자 SLA 지표를 개발하여 정량적으로 관리하는 것이 필요하다. 본 연구는 개인정보보호 SLA 지표를 개발하여 개인정보보호 SLA 지표 정보수집 방법, 시기 등의 구체적인 안을 제시하였다. 특히, 전문가 그룹을 중심으로 온라인 설문조사를 실시한 결과 개인정보 파기 준수율, 개인정보보호 시스템 접근통제 준수율의 경우 그 중요성과 타당성 측면에서 실제 공공정보화 사업에 SLA 신규 및 개정 시 적용하여 관리하는 것이 효과가 클 것이라는 의견을 받았다. 향후, 이러한 개인정보보호를 위한 SLA 지표를 공공정보화 유지관리에 기준으로 활용함으로서 SW품질을 높이고 안전성 확보에 기여할 것이다.

주제어 : 개인정보, SLA, 공공정보화, 품질관리, 정보보안

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1. INTRODUCTION

In the field of public informatization, as the exposure of personal information protection increases and the contract period of the project increases from 1 year to several years, differences in opinions on SLA(Service Level Agreement) indicators among contractors are gradually increasing. It is necessary to prevent such security incidents in advance and to quantitatively manage roles and responsibilities between providers and users by developing SLA indicators. Therefore, this study intends to develop and present a specific, measurable SLA indicator by deriving implications by examining representative SLA indicators and R&R (Roles and Responsibilities) of public institutions[1]. SLA indicators are quantitatively managed and reliability and high-quality services must be ensured through activities[2-7]. We intend to supplement the existing SLA indicators by presenting details such as compliance with personal information destruction and mutual roles and responsibilities through analysis of SLA indicators of public institutions. This will alleviate mutual issues that may arise in the future in the field of public informatization and personal information protection. The results of this study are verified through online surveys of related expert groups.

2. Related research

2.1 Status of damage to personal information protection in the public information field

Looking at the report of the administrative safety committee in Table 1 below, it can be seen that the number of personal information protection exposures is continuously occurring in government departments, local governments, associations, and organizations[8]. Representative personal information includes name, resident registration number, telephone number, health-related information, and email, and it is known that most of these personal information exposure cases are neglected and leaked by internal and external users[9].

Table 1. Number of personal information exposure by public and institution[8].

Div (year)	Number of personal information exposure by institution				Sum
	Government dep'	Municipality	Affiliated organizations, etc.	Association / Group	
2013	1,048	18,863	20,723	15,592	56,226
2014	1,929	26,045	15,394	87,196	130,564
2015	509	6,623	32,903	142,410	182,445
2016	365	15,066	6,385	286,664	317,161
2017	261	1,993	824	4,228	7,306
Sum	7,324	102,763	120,599	569,660	809,027

Recently, it is common for the public and private sector to entrust the management of personal information management systems to external professional SI service companies[10]. Since IT resources are operated by external IT service companies, there is a positive effect of improving service quality by operating centered on professional personnel, but on the contrary, errors in operating personnel or accidental access to internal systems and leakage to the outside occur.

2.2 SLA operation status in the public information field

Let's take a look at the SLAs introduced and used in the public information operation maintenance management project and examine whether to manage SLA indicators for personal information protection. Table 2 below shows examples of typical R&R between service providers and users.

Table 2. SLA responsibilities by business area[11,12].

Division	Responsibilities	
	Ord	Con
1. System and database operation		
● Establishing operating procedures		○
● Review and approval of operating procedures	○	
● System operation by approved procedure		○
● Report system operation results		○
● Review and approve system operation results	○	
● Equipment management (including S/W)		○
● Review / suggestion of necessary H/W, S/W		○
● Disability recovery procedures		○
● Conduct preventive inspections and report results		○
● Rapid failure recovery		○
● Control of users and services in case of emergency	○	
● Disability report creation and reporting		○
● Review and approval of disability report	○	
● Establish backup plan		○
● Review and approval of backup plan	○	
● Perform backup		○
● Backup record management		○
● Provide backup media (if necessary)	○	
2. Security Management		
● Establish security guidelines	○	○
● Security inspection item definition and reporting		○
● Review and approval of security check items	○	
● Perform security check		○
● Report of security check results		○
● Review and approval of security inspection results	○	
● Provision of security S/W (if necessary)	○	
● Security S/W operation		○
● Request to register, change or delete access rights	○	
● Register, change, or delete access rights		○
● Firewall system operation		○
● Setting and changing firewall security rules		○
● Review and suggestion of necessary security S/W		○

As shown in Table 2. above, it can be seen that some R&R are not defined for system security matters related to personal information. Table 3 below is an example of the SLA indicators that presented concrete and enhanced content.

Table 3. Examples of SLA indicators

SLA indicator items		weight	Evaluation level	
			Expected (1.0)	Minimum(0.6)
System	Operation rate	10	99.99%	99.80%
	Number of disabilities	5	3	7
	Disability time	5	Within 2 hours	Within 6 hours
Group ware	Number of faults and errors	5	10 or less	20 or less
	S/R timely throughput	5	100%	90%
Network	Operation rate	10	99.99%	99.80%
	Number of disabilities	5	3	7
	Disability time	5	Within 2 hours	Within 6 hours
Operation improvement and output management	Improvement number	5	3 hours or more	1 or more
	Improving measures/ Suggestions	5	5 cases / quarter	3 cases / quarter
	Output lead standard number	5	Within the deadline	D+5 or more
	Output management status	5	eminence	usually
Service Desk	Immediate throughput	5	70%	50%
	1st processing rate	5	80%	60%
Office automation equipment	Compliance rate	5	100%	90%

In public institutions, there are differences between institutions. As shown in Table 3 above, it is used as a quantitative evaluation tool for maintaining and improving service level for user's activities on a monthly basis based on SLA items.

2.3 Implication

As a result of examining the representative SLA indicators and R&R of public institutions, the absence of quantitative indicators for the protection of personal information and the roles and responsibilities between providers and users may lead to problems such as accountability when issues arise in the future. Table 4 below analyzes the contents of each SLA index management status by implication.

Table 4. Content analysis by implication

Implication	Contents
Privacy No SLA indicator	● It is necessary to manage whether personal information is used and stored, and whether it is destroyed or not. ● Whether the personal information management system complies with access control management ● Absence of related indicators, such as compliance with control of physical places that manage personal information systems
No roles and responsibilities for the security of personal information	● It is necessary to define the role for the behavior according to the use of personal information and the retention period ● It is necessary to grant access authority of personal information management system and role and responsibility for history management ● The role and responsibility for stabilization measures according to the physical location of the personal information system is required.

3. Proposal of SLA indicators for public information privacy protection

3.1 Standard for deriving SLA indicators

The derivation criteria conform to Harbour's SMART model, and provide criteria for specificity, measurable, action-oriented, relevant, and timely[1,7,15]. The measurement method and the quantification method for this were described in detail below.

3.2 Development of personal information protection SLA indicators

In order to secure IT service quality, SLA indicators for personal information protection were presented by setting specific indicators in the Management, technical, and physical fields as shown in Table 5 below. This has quantitative and scientific advantages as it includes practical, field-oriented details.

Table 5. Privacy SLA indicators[13-15].

Indicators	Explanation
Destruction compliance rate (Management)	● Manage whether the legal procedures and destruction activities in accordance with the completion of use and storage period within the purpose were followed in a timely manner.
Access control compliance rate (Technical)	● Manage compliance with legitimacy, such as granting access to personal information protection systems and managing access logs.
Facility protection activity compliance rate (Physical)	● Management of whether the protection activities for the infrastructure related to personal information have been properly performed.

Table 6. below shows the measurement target, measurement method, measurement tool, and measurement cycle for each indicator for the measurement method of the personal information protection SLA indicator. Since this is a reliable and quantitative measure of work, it can be used as a standard to judge personal information protection means and mutual business issues.

Table 6. Measurement method of SLA index

Indicators	object	Way	Tool	Cycle
Destruction compliance rate (%)	File and usage log	Completed / Total number	Personal information protection management system	month
Access control compliance rate (%)	Collection performance	Number of access control / Total number	Account management system	month
Facility protection activity compliance rate (%)	Compliance performance	Number of protective activities / total number	Information Protection Guidelines	month

4. Validity and reliability verification

We conducted a Google online survey to verify whether the SLA indicators presented above can be introduced and feasible in the field. We conducted a survey focusing on the practical field. The survey targeted a total of 50 people, 17 consignment project managers, 13 quality assurance managers, and 16 personal information managers focused on field practitioners. Experts with a response rate of 100% participated in the survey and gave opinions on the proposed SLA indicators.

Table 7. FGI results

SLA indicator	Survey questionnaire	participants	result		
			Necessity	Importance	Possibility
Destruction compliance rate (%)	PM	17	4.5	4.5	4.6
	QAM	13			
	PIM	16			
	ISMS	4			
Personal information protection system access control compliance rate (%)	PM	17	4.0	3.9	4.1
	QAM	13			
	PIM	16			
	ISMS	4			
Compliance rate for protection of personal information handling facilities (%)	PM	17	3.2	3.4	2.9
	QAM	13			
	PIM	16			
	ISMS	4			

As shown in Table 7. the results of the survey showed that the personal information destruction compliance rate(%) and access control compliance rate(%) were highly evaluated. Particularly, there was an opinion that the effect would be great in terms of management. In the case of the compliance rate(%) for the protection of personal information handling facilities, it was already managed in terms of physical security, and some activities, such as personal PCs, received relatively low scores that could be used to manage duplicate indicators.

5. Conclusion

SLA contracts are emphasized as part of securing IT service quality, but privacy incidents are increasing. In this paper, as a result of analyzing the SLA indicators of existing public institutions, it was found that the development of the SLA indicators for personal information protection accident prevention activities is insufficient. In order to minimize the protection of personal information through IT service operation and maintenance activities, detailed indicators such as the personal information destruction compliance rate, personal information protection system access control compliance rate, and personal information processing facility protection activity compliance rate were proposed. As a result of questioning the importance and validity of this SLA indicator to a group of experts, we received the majority of responses that we would like to introduce and use the proposed SLA indicator in the field. The limitation of this study is regrettable to work through more sample groups. In order to minimize personal information accidents and alleviate mutual business issues, research on the development of continuous SLA indicators is necessary.

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