

# Building up an IT Service Management System through the ISO 20000 Certification

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## ABSTRACT

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This study prepared a foundation to provide high-quality services in a stable and effective way to meet the customer expectations, by building up and establishing an ISO 20000 certified IT service management system and protecting the information assets from various threats through effective system operation that meets the requirements of international standards, in order to ensure the reliability and stability of NDSL public services provided by KISTI Information Service Center and to enhance the customer satisfaction.

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## 1. Introduction

### *1.1. Need for Study*

According to the International Organization for Standardization (ISO), small and large organizations in more than 159 countries have been certified by ISO 9000 International Quality Management System, which implies that quality management has become an essential element for enterprises to produce high-quality products and to meet customer's needs.

In other words, an effective quality management system can play an important role in providing an environment where a company's products or services meet the customer's needs any time and thus enhancing the company's competitiveness.

For KISTI Information Service Center (National Discovery for Science Leaders, hereinafter to be referred to as "NDSL"), where information and information distribution are products, it is time to adopt a process-based system operation so that the quality of information it provides can meet the customer's need.

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KISTI obtained the ISO 9001:2000 quality management system certification in November 2003 and the IT-based quality management system certification in 2003, in order to enhance the international competitiveness in the field of science and technology information distribution and service, and to lead the national knowledge information infrastructure (Kim, 2000).

Now, we are planning to build up a service management system through ISO 20000 certification in order to ensure reliability and stability of NDSL remote station services provided by the Information Service Center and to improve the customer satisfaction.

The Information Service Center has a service policy to provide high-quality services which meet customer expectations in a stable and effective manner, by building up and effectively operating a management system in compliance with the ISO 20000 requirements and protecting the information assets from various threats.

For this, we have promoted to plan, implement, examine and continuously improve a management system to ensure compliance with the interested parties' requirements and regulations, establishment and management of objectives, effective resource operation, management review and seamless communication, and have decided upon the following implementation guidelines: First, raise the international status of NDSL services by maximizing the availability and continuity of the services and providing the best-quality services. Second, conduct all works in such a way that prevent non-compliance from arising and ensure problems are taken care of in a timely manner. Third, protect the information assets from threats. Fourth, foster workforce through education and training and ensure the service provider to make every effort to improve the service quality. Last, but not least, ensure that each and every member of the staff of the Information Service Center understands, practices, keeps, and improves these objectives.

### *1.2. Basic Policy of the Study*

The KISTI Information Center has established a basic policy for annual service activities, in order to promote continuous quality improvement for the information system service by preparing and implementing the service management policies for the NDSL service including its vision and goals. The policy serves as the basis of NDSL service operation and management activities and aims at maintaining the consistency of works through training of related personnel and reaching the consensus among them (Kim, 2006).

The basic policy covers establishing the service policies including vision, goals and performance indicators, organization and division of duties, workforce planning, planning of education and training based on the eligibility criteria for each area of work, establishing the work procedure and processes for each team, establishing the document classification system and standard documents, ongoing service management, and establishing the improvement process (Hwang, 2011).

The policy applies to all activities related to providing major NDSL services ([www.ndsl.kr](http://www.ndsl.kr)) such as planning, operating, inspecting and improving the management system for NDSL services. NDSL services include the following:

First, "NDSL Paper" is the nation's largest paper search service by which users can search for

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any articles in journals and proceedings published by science and technology societies and associations at home and abroad.

Second, “NDSL Patent” is a service that allows users to search exhaustive patent information including more than three million Korean patents announced since 1948 and those produced by the United States, Japan, and Europe Patent Offices and have been made public or registered since 1976. Users can use Korean patent, US patent, European patent, and WIPO patent in one-stop from search to obtaining the original text.

Third, “NDSL Report” provides national R & D reports, various policy reports, and analysis reports. It is an integrated service that collects and associates various reports produced by universities, research institutes, and enterprises, in one-stop, even including electronic text (full-text) in cases of the latest reports.

Fourth, “NDSL Trend Analysis” provides information about the latest trends in the field of science and technology as well as science and technology policies of major countries and the differentiated trend information from the perspective of the leaders of those fields.

Fifth, “NDSL Standard” allows users to conduct integrated searches for the standards of Korea Industrial Standard (KS), International Organization for Standardization (ISO), and International Electrotechnical Commission (IEC). It is provided in cooperation with the Korean Agency for Technology and Standards (KATS) Standards Information Center.

Sixth, “Digital Korean Human Body Information” provides researchers at home and abroad with data about Korean body images, models, and skeleton properties, so that it can be utilized as basic data for various digital human modeling and simulation research being developed for the dynamic analysis of biomedical engineering, rehabilitation engineering, sports, and industry stabilization.

## **2. Basic Concepts of ISO and ISO 20000**

### *2.1. Basic Concept of ISO*

ISO stands for the International Organization for Standardization, which forms fora consisting of experts from various countries to establish and revise international standards required for industries. Types of widely accepted ISO standards are as follows:

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Type	Standards
ISO 9001	Certification of the quality management system for efficient business management
ISO 9001 & ISO 14001	Certification of the quality & environment integration system
ISO 10002	Certification for customer satisfaction to realize potential customer satisfaction
ISO 13485	Certification for the field of medical equipment
ISO 14001	Certification of the environment management system
ISO/TS 16949	Certification of the standard quality management system for improving the quality of automobile supply network
ISO 17799	Certification of the information security management system
ISO/IEC 20000	Certification of the international standard certification standards for IT Service Management (ITSM)
ISO 22000	Certification of the international standard certification standards for IT Service Management (ITSM) (* Integrated certification for ISO9001 + ISO14001 + HACCP)
ISO 26000	Certification of the international standards for social responsibility activities
ISO/IEC 27001	Certification for overall management configuration system for Information Security Management System (ISMS) and information security
ISO 29001	Certification of the quality management system standard regulations for petroleum gas supply networks
ISO 29990	Basic requirements for the learning service providers of non-formal education and training

## 2.2. Basic Concept of ISO 20000

ISO 20000 international standard, of which certification the Information Service Center has obtained at this time, is a model of the international standards for IT services. It is an efficient solution for IT service organizations/companies to get certification from an international certification organization through verification of conformity to ITSM.

ISO 20000 is a revision of BS 15000 Certification of British Standard Institution (BSI), which had been utilized as a practical international standard certification specification for the ITSM (Disterer, 2009).

The reason for obtaining ISO 20000 certification is because information technology (IT) is an essential element for today's business operation but problems due to IT services, which do not meet the customers' or the organization's needs internally or when they are outsourced, are increasing. By obtaining the certification for this standard, an organization can objectively prove to its customers that it conforms to the best business practices.

ISO 20000 has been introduced to major IT-related fields such as business process outsourcing, communication, financing, and public services, and have produced positive effects. It has established the standards and minimum requirements for verification of ITSM implementation through detailed guidelines for ITSM. Furthermore, it provides substantial regulations and practices for service management through best practices of service management processes within the scope of the detailed guidelines.

Internally, ISO certification has the following expected effects. First of all, it ensures customer satisfaction and trust for the effectiveness, service quality, and information security of NDSL IT

service processes. It provides a service environment in which national research and development information can be easily accessed through the ITSM system, and also provides an effective maintenance and management system for information systems. By ensuring compliance with the guidelines and procedures for the ITSM system and thus ensuring the consistency of works and removing excesses and wastes in advance, the process improves the quality of services. The efforts to enhance the quality of IT services will result in cost-effective IT investments and help customers accomplish their business goals faster. As the number of organizations, which require the reduced service cost, customers' requests for decision-making, and ISO 20000 certification as terms of the contract, is increasing, the external service providers can secure new customers by using this certification as a means of differentiation from competitors and maintain and secure the efficiency of the ITSM processes through regular certification audits. Also, the ISO 20000 has the effect of cost-saving by visibly presenting the result of continuous efforts for improving the quality and level of IT services.

Externally, ISO 20000 certification signifies that a company's ITSM has been recognized by an internationally accredited certification organization. Thus, it can enhance the company's status to the outside. ISO 20000 can help the government agencies improve the quality of their services for the public, enhance customer satisfaction, and ensure the reliability of IT services. It enables IT service providers to respond to the business-centered services more effectively than to technology-centered services. Overall, ISO 20000 completely agrees with the IT Infrastructure Library (ITIL) that presents the best formal business processing for ITSM processes.

### **3. Application of ISO 2000 for Building up NDSL Service Management System**

#### *3.1. Basic Direction*

NDSL is a service that secures the service management system standard for a series of processes to collect, process and service the national science and technology information in the business environment and provides for the reliability of the system. It aims at increasing the stability and efficiency of NDSL service operation by building up a system that reflects the ISO 20000 requirements and complying with business procedures and guidelines, and improving customer satisfaction through continuous management of service level. It intends to be acknowledged for its suitability for IT services by getting the certification from an internationally accredited organization, and to continuously maintain and improve its effectiveness and efficiency of system operation through regular follow-up evaluations.

##### *3.1.1. Scope and Major Content*

This process of obtaining certification requires the following actions: analyze the current status and cases of NDSL service management system based on SOP, establish plans to apply the analysis results, establish an improved NDSL service management system based on ISO 20000, establish ISO 20000/9001/10002 application strategies and implementation plans, and distribute roles for settling down ISO 20000-based NDSL service management system among organizations.

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Furthermore, other important steps in this process include: conduct education and training for NDSL service operating personnel, including the overview of IT service management, ISO 20000 framework, understanding of the requirements of the ISO 20000 standard, the internal auditor training, and the maintenance of ISO 9001/ISO 10002 certification, build up ISO 20000 processes (support and core processes) by establishing and operating an ISO management system for NDSL services, upgrade ISO 10002 operating system, and monitor, verify, internally audit, and take corrective actions for the management system.

### *3.1.2. Procedure and Method of ISO20000 Certification*

First, consult regarding the ISO 20000 standards and certification information, to establish and implement a system that meets the requirements of the standard.

Second, apply for certification. Though varying between certification agencies, the documents required for application generally include an application form, questionnaire, and contract. As there are certain requirements to be met for applying for certification, an application may be rejected if the requirements were not met.

Third, a preliminary screening is performed before regular review for the following purposes: to understand the company's operation and the subject or service to be reviewed, and to shorten the screening period accordingly and substantiate of the screening program, to check the applicant's preparation and to save the applicant's cost and efforts and the reviewer's time by rejecting inadequate applications, and to provide the reviewed with opportunities to correctly understand and practice the standards. The preliminary examination focuses on verifying whether the quality system is substantially operating.

Fourth, the documentary review plays an important part in the quality system certification system, unlike in the general product certification system. As the concept of system certification system scheme is for a company to prove through third parties whether it documents and maintains all aspects of its products and/or services and complies with its quality standards, a service manual that describes all aspects of the system can be considered similar to a constitution of a country. In addition, at the time of quality manual review, related procedures or guidelines may be requested in order to avoid unnecessary delay in the screening that may occur if a reviewer does not understand the system properly.

Fifth, on-site examination is scheduled between the applicant and the certification authority when it is verified that the applicant's quality system conforms to the requirements of the international standard (ISO 20000) quality system.

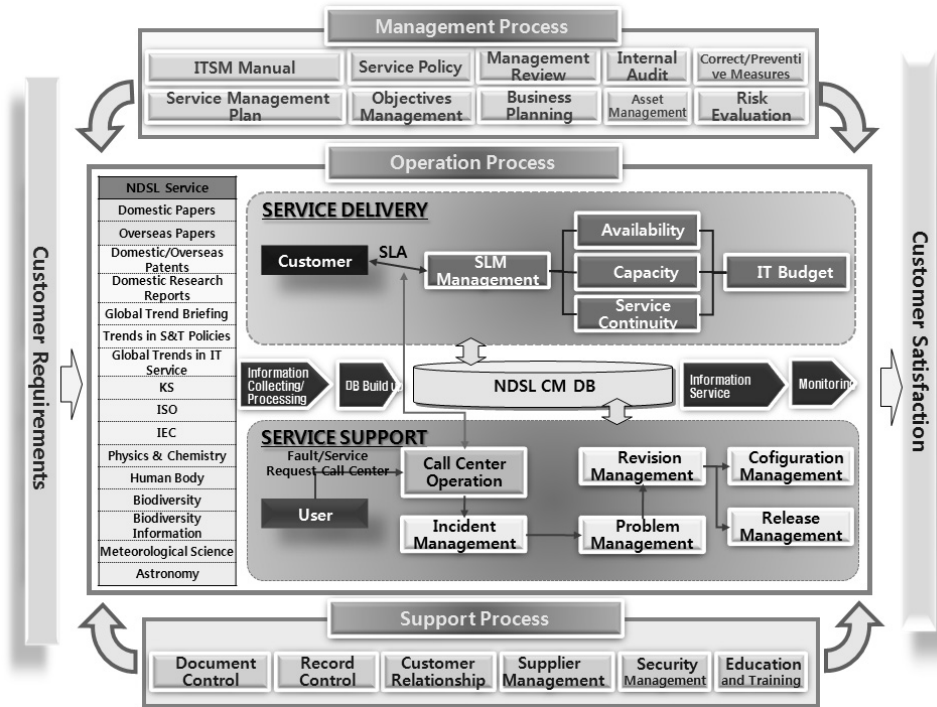
Sixth, the certificate is issued when no nonconformity is found in all the reviews and examinations or when all the detected nonconformities are resolved. The certification expires usually in three years, after which it can be renewed through recertification examination or through follow-up examination without recertification examination.

Seventh, the follow-up examination is conducted to make sure that the system is still effective and continually improved.

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### 3.2. Current Status of NDSL Service Management System

The NDSL services cover academic papers, patents, reports, trends, standards and factual information. The conceptual diagram and process map for the service is shown below.



<NDSL Service Process Map>

### 3.3. Requirements for ISO 20000 Service Management System

ISO 20000 provides a framework for managing five major processes of IT services to meet the international standard, including but not limited to establishing a policy for NDSL service management, planning (Plan), executing (Do), checking (Check) and taking actions (Action) for the service management system, and managing new and changed services, in order to ensure customer trust in the IT services and promote continuous quality improvement.

Accordingly, it is necessary to develop service policies to establish the objectives (performance indicators), organize and divide duties, establish the eligibility of personnel for each field of work, establish an education and training system, define the work procedure, establish IT service processes, establish a document classification system and standard documents, ensure ongoing service management, and establish an improvement process.

### 3.4. *Application of ISO 20000 to Build NDSL Service Management System*

The policy to ensure NDSL service management in compliance with ISO 20000 international standards shall be established and applied, to build up an IT service operation and management system of the international standard.

For this, the following management responsibilities and roles shall be allocated:

First, the Center Director, as Chief Executive Officer responsible for executing the service operation, shall have the overall responsibility and authority for the services provided and the service management system. He or she shall be responsible for developing the capabilities for providing and managing NDSL services and for ensuring those services to be executed and improved. He or she shall also be responsible for approving preparation and revision of service management policies and manuals, approving service management plans, electing service managers, supporting the business to achieve service goals and ongoing improvement of services, and supervising the management review (one a year or more).

Second, IT Service Manager (Management Representative), appointed by the Center Director, shall have the responsibility and authority to ensure the suitability and effectiveness of the service management system so that all the activities related to provision and management of IT services can be executed in compliance with the requirements of the ISO 20000, the customer's needs and the related regulatory requirements. With regards to provision and management of the services, he or she shall also be responsible for executing the following duties: supervising preparation and revision of standard processes for service management, issuing and managing service management documents, establishing and executing service management plans, organizing a service management team and appointing the person in charge, coordinating service management processes, supplying and providing the required resources, identifying and managing potential risks, conducting education and training for service management and change management, developing and managing service improvement plans, preparing and executing internal audit plans, and preparing for management review and reporting its result to the Director of the Information Service Center.

Third, each department head/team leader shall be responsible for preparing and maintaining the service management plans for services the department/team provides, and has the responsibility and authority to divide duties to members of the department/team according to this Manual and the standard process and to perform education/training for them to conduct their duties. He or she shall also be responsible for executing the service management plans for the services, managing the personnel and resources in charge of the corresponding services, and coordinating the corresponding service management processes.

Fourth, the processor owner has the responsibility and authority to monitor and improve the status of implementation of the corresponding process, to manage the corresponding process documents and records, to conduct education and training for the corresponding process, to respond to the results of auditing the corresponding process, and to measure and report the performance of the corresponding process.

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#### *3.4.1. NDSL Information Asset Risk Assessment Process*

This process defines the risk assessment conducted for the purpose of ensuring the availability and continuity of the information system by assessing the risk of services through the information system or its assets, and accordingly establishing and applying proper risk mitigation measures for the corresponding risk.

Major process steps include identifying the information assets, evaluating their value, assessing their risks, and the follow-up management. The identification activity is to identify the information assets related to NDSL services. The evaluation activity is to identify the importance and characteristics of the information assets, and evaluate their value based on their confidentiality, integrity and availability. Next, the risk assessment activity is to understand the risk, which has a potential and major impact on the asset, and to analyze its likelihood and its impact on the information asset. Lastly, the follow-up management is to decide DOA based on the evaluation result and take proper improvement measures for DOA items.

#### *3.4.2. NDSL Service Level and Report Management Process*

This process aims at defining services to be provided, determining the target level for the defined services, managing the services to achieve the target level, and maintaining and improving the quality of IT services at the determined or higher level.

Major process steps: First, prepare SLAs through service catalog preparation, management object selection, understanding the current capability level and defining the service level, and to consult with the client about them. Second, monitor and report the service level. This activity is to monitor the services based on the determined SLAs, to collect reliable data, prepare the monthly service level report, to conduct the service review meeting based on the prepared SLA report to evaluate the service level, and collect the customer's opinions about the service. Last, improve the services. This step is intended to identify matters that may adversely affect service quality, to take measures to improve those matters, and to reflect the SLAs redefined through this activity in the service level management after consultation with the client.

#### *3.4.3. NDSL Availability Management Process*

This process is to understand a proper level of availability of NDSL services and to continuously monitor their availability to ensure the availability target agreed with the client. It also includes proper improvement activities, to achieve the agreed availability target.

Major process steps: Availability planning sets the target value for service availability to maximize the availability of IT services and meet the business needs, and to establish the management plan. Next, availability data monitoring and report checks whether the established availability level is met, to conduct the maintenance activities predefined according to the availability management plan, and to report the results. Lastly, availability improvement implements the availability improvement plans established at the time of setting the target for improving the system and service availability, and to implement the improvement plans if, as a result of regular analysis, it deems necessary to improve the availability. If there is no need for availability improvement, regular analysis shall be conducted based on the collected information.

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#### *3.4.4. NDSL Business Continuity Management Process*

This SOP aims at prompt recovery and improvement to achieve the continuity target defined for the level of NDSL services. When a disaster happens, the level of service continuity agreed with the client shall be guaranteed through prompt response and recovery activities. Also, even when normal access is blocked, the service continuity plan, the emergency contact network, and the configuration management database shall be available.

Major process steps: Planning establishes improvement plans by carrying out performance tests for the service continuity and analyzing and reviewing the matters found necessary to be improved as a result of the test. Performance testing carries out tests according to the performance test plan, analyzes the results, prepares the report, and establishes improvement plans based on the analysis results. Lastly, emergency recovery recovers the system and services according to the service recovery procedure using backup files, and resumes normal services.

#### *3.4.5. NDSL IT Financial Management Process*

This process aims at managing the budget and accounting activities for IT services provided by the Information Service Center. The IT financial management refers to the budget and accounting activities required for providing IT services. Namely, it is the budgeting and accounting for all elements of the IT services such as IT assets, shared resources, overhead, services provided by the outside suppliers, workforce, insurance, and licenses.

Major process steps: Budgeting establishes a plan for the expenses required for providing IT services and seeks its approval. Budget execution and accounting monitors the difference between the budget and the actual expenses spent for the business, and identifies the cause of any difference.

#### *3.4.6. NDSL Capacity Management Process*

This process is to ensure that the business requirements for the current and future capacity and performance will be cost-effectively provided, by predicting future business requirements and continuously monitoring and improving the system resources. It includes monitoring the performance and capacity of IT services and of IT elements that support those services, understanding the current demand for the IT resources, and predicting future needs. It also includes managing the demand for resources and establishing the capacity management plan to estimate required IT resources, in relation with other service management processes.

Major process steps: Capacity planning ensures that the current and future business requirements for IT services are properly reviewed and the capacity sufficient for supporting those services are planned and implemented in a timely manner. Monitoring and analysis monitors the management items defined to meet the target service rate, derives matters to be improved through the capacity trend analysis and regular analysis of accumulated data, and estimates the capacity of new services by reviewing and modeling new technology application plans for the new services. Lastly, the improvement task establishes the required capacity improvement plan, and reviews the progress and result of the plan.

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#### *3.4.7. NDSL Information Security Management Process*

This process is to provide stable information system services by protecting tangible and intangible assets such as hardware, software, operation personnel, management system, and management policies. It includes establishing the standardized policy and procedures for the information system security, blocking unauthorized access to the communication network to ensure data security, and controlling the access to the facilities and unauthorized access by trespassers.

Major process steps: Establishing the information security policy defines the objects of information security for the related IT services and technology infrastructure, assesses the potential risks, and documents the information security policies/guidelines to comply with the customer security policy and guidelines. Operation of the information security education defines the objects of security education, the education plan, and main contents of the security education, and the security accident investigation and countermeasures inspect and audit the information security and define countermeasures against the security violation. Lastly, the follow-up management step establishes plans to improve the problems identified during the information security operation and defines the actions to be taken to implement the plans.

#### *3.4.8. NDSL Customer Relationship Management Process*

This process aims at improving the reliability of the Information Service Center by promptly and accurately resolving customer complaints about NDSL, and reducing and preventing future complaints from arising by improving the quality of administrative services.

Major process steps: Voice of Customer (VOC) reception and identification process describes how to receive, process and identify the customer complaints. VOC handling describes the procedure for investigating causes of the complaints, reviewing the complaints and establishing countermeasures against the complaints. VOC follow-up management is to manage the records about VOC handling and to analyze VOCs regularly. Lastly, customer satisfaction monitoring checks the validity of the corrective measures taken and conducts post-management.

#### *3.4.9. NDSL Supplier Management Process*

This process is to ensure the NDSL information system operates efficiently, by maintaining a seamless relationship with suppliers who supply and maintain all hardware, packages, and development software required for providing NDSL services. This process requires the service provider and the suppliers to understand their own responsibilities and duties, the service provider to manage the suppliers so as to ensure stable provision of high-quality services, and the service providers to be committed to their responsibilities to the service provider.

Major process steps: Defining the requirements defines the product requirements for IT infrastructure, taking into consideration the market trend, customer demands, SLAs and availability requirements, and selects suitable products. Supplier selection reviews the criteria for selecting the suppliers based on the defined requirements, evaluates/selects the suppliers, and enters into contracts with them through internal approval. Delivery and operation support the delivery/installation after the adaptation test is completed according to the contracts, and monitor whether the contract terms including product performance and maintenance are fulfilled. Lastly, follow-up management ensures that the service

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provider shall carry out the operation management after the contract period ends and have the suppliers promptly correct the errors arising during the operation management.

#### *3.4.10. NDSL Incident Management Process*

This process is to minimize the impact of various incidents arising from NDSL services, by effectively handling them, systematically managing the results, and therefore recovering normal service functions as soon as possible. In this process, the priority of an incident to be handled is determined based on the level of its impact on the services, with the focus on prompt service recovery rather than on identification of the causes. The faults for which causes remain unidentified shall be transferred to the fault management process, and all incidents shall be recorded in compliance with this process.

Major process steps: Reception and recording register all incidents reported to the service desk by phone or e-mail, including those detected through the operator's inspection and monitoring activities. Classification and initial support classify the received incidents based on the defined criteria, and carry out initial actions after comparing them with the records about the previous incident handling and the known errors. Investigation and diagnosis investigate the incident to ensure prompt service recovery and suggest a fundamental or a tentative solution. Resolution and recovery resolve the incident according to the derived solution, and restore service to normal conditions. Lastly, closing and follow-up management close the incident, notify the customer of the resolution, and confirm with the customer that normal service has been restored.

#### *3.4.11. NDSL Fault Management Process*

This process is to suggest solutions to the faults for which causes have not been identified, among those arising during the service operation, and to provide the procedure required for fault analysis and prevention. It shall be managed separately from the incident management process. All identified faults should be recorded, and potential faults should be reduced through prevention activities. The fault management process shall also include known-error management and management of the suggested solutions.

Major process steps: Reception and registration receive the request for handling a fault as the fault is identified, register it to the fault DB, determine its priority, and assign a person in charge. Cause analysis analyzes the fundamental cause of the fault and derives a solution. Lastly, the sharing and closing step registers the derived solution to the DB and shares it.

#### *3.4.12. NDSL Configuration Management Process*

This process aims at managing and controlling each component of the NDSL system to ensure effective and efficient NDSL services. It involves checking, recording, and reporting all components within the scope of configuration management, to ensure efficient management of the components and provision of accurate information about them.

Major process steps: Establishing the configuration management plan defines and plans the goal, objectives, scope, policies, procedures, and technical situations for configuration management. Configuration control ensures that only the approved and identifiable components are managed through

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the configuration control and reflected in the configuration management database. In this controlled environment, no components without an official document like approved change request can be added, modified, replaced, or removed. Lastly, configuration audit and improvement checks whether each component is actually present in the system, and continuously reviews and audits whether it is correctly recorded in the configuration management database.

#### *3.4.13. NDSL Change Management Process*

This process is to continuously improve the information system operation by efficiently and promptly handling all changes according to the standardized methods and procedures and thus minimizing the impacts of the changes on the service quality. It includes clearly defining and documenting the changes of services and infrastructure, recording and classifying all change requests, evaluating risks, impacts and business benefits, reviewing actions taken to make changes happen and those taken after the changes are implemented, and utilizing the review results as the basis of release scheduling.

Major process steps: Change request reception receives change requests after clarifying the details of the change requests. Change review and classification classifies the types of the change requests and reviews their content. Performing the change notifies the related personnel/organization of the change plan and performs the change. Follow-up management checks the validity of corrective actions taken and performs the post-management.

#### *3.4.14. NDSL Release Management Process*

This process is to protect the IT operation environment and the IT services by releasing and verifying the hardware and the related software required for completing the changes to IT environment, under the release manager's control. It involves identifying the roles and responsibilities of the release manager and the person in charge of each step, defining the release policy, installing the hardware/software according to the release type, and devising recovery plans and test methods.

Major process steps: Release planning defines the objects to be released, establishes release plans, and requests for the release. Releasing reviews and approves the release plan, and performs the change. Release verification prepares the checklist for verifying the release and verifies the validity of the change/release. Lastly, follow-up management checks the validity of the corrective actions taken and performs the post-management.

## **4. Conclusion and Suggestions**

In order for KISTI National Discovery for Science Leaders (NDSL), whose products are information and information distribution, to provide the quality information required by the customer, a process-based system management is a must. ISO 20000 international standard, of which certification has been obtained by the KISTI Information Service Center, is a model of international standards for IT services, and all organizations/companies carrying out IT services need to be certified by this international standard through verification of their compliance with the IT Service Management

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(ITSM) system.

This standard has been introduced to major IT-related fields including but not limited to business process outsourcing, communication, finance, and the public sector, to produce positive effects, and it is required in order to ensure customer satisfaction and reliability on the effectiveness of NDSL IT services, the quality of service, and information security.

Efforts to enhance the quality of IT services result in increasing the cost-effectiveness of the investments in IT services, hastening the achievement of the customer's business goals, and thus resulting in service costs and reflecting the customer's requirements for decision-making.

Basic policy for the ISO 20000 application to NDSL is to secure the service management system standard for a series of processes for collecting, processing and servicing national science and technology information in the business environment, and to ensure the reliability of the NDSL services.

It covers understanding the current status of the NDSL service management system, establishing plans to apply the system, conducting training and education for the operation and service personnel, and establishing and operating the service ISO management system. It also includes establishing the NDSL service management guidelines and the IT service operation and management system in compliance with ISO 20000 international standard.

In the future, continuous efforts are required to enhance the status of NDSL as an IT service provider to the outside world, through a well-established IT service management system certified by an internationally accredited agency. For this, it is necessary to promote planning, implementing, inspecting, and continuously improving the management system to ensure compliance with the interested parties' requirements and the regulations, systematic planning, effective resource operations, management review, and seamless communication. Furthermore, the IT service providers should make efforts to respond more effectively to business-oriented services than to the technology-oriented services.

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