Information system planning process design based on clause 8 iso 20000-1:2018 using sysml language

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Abstract. Information systems have become inseparable from current products and services. Improving information systems will add value to the quality of products and services. Some references can be used to produce a good information system. One reference that can be used is ISO 20000-1: 2018. Because of the new standards, there are not many studies that guide the implementation. This paper aims to contribute in providing references for application in aspects of information system planning based on clause 8 ISO 20000-1: 2018. The modelling process uses SysML modelling language. We find the guidance to implementation of this standard and the example of Model Based System Engineering using Block Definition Diagram.

1. Introduction
The organization has a strategy to achieve the organization's vision, mission and goals. The process of preparing the strategy through the process of analyzing the external and internal conditions of the organization [1] [2]. Strategies can be divided into macro level strategies to micro level strategies. The BCG matrix, for example, is a tool for choosing which business portfolio is superior [3]. Even at the technical level there is a strategy to maintain the services of the organization. one form of its strategy is to manage services and certify those services so that quality is maintained.

ISO 20000-1:2018 is one form of certification to information systems services. The certification is carried out to provide information to consumers that the organization is committed to maintaining service quality. The certification also proves that the external organization, which is the certification body, is also involved in maintaining the quality through the control and audit process.

Some organizations are at risk of experiencing difficulties in implementing ISO 20000-1: 2018 standards. This paper aims to provide guidance to organizations in implementing the implementation of ISO 20000-1: 2018. The guidance provided is mainly in the aspects of planning and implementing information system services. The guide that was built refers mainly to clause 8. This is because in the concept of high level structure, besides clause 8 it does not focus on the main theme of the standard. Other than clause 8, it does not specifically regulate the theme of ISO 20000-1: 2018, which is information system services.

Some previous research is a guide and reference. Previous research is not only related to ISO 20000-1: 2018 but also for the 2011 series. There is research that also examines the understanding and interpretation of ISO 20000-1:2018 [4]. Other research discusses the proposed development of the 2011 series [5]. Other research attempts to apply in several fields, selling system [6] and project management [7]. There is also research that examines the latest series of ISO 20000-1:2018. The amount of research...
is not much. Some existing research is trying to synchronize ISO 20000-1: 2018 with other management practices; as an inspiration for risk management [8], as a reference for digital transformation [9], and as a reference for handling information systems security [10]. There is also research that offers procedures for implementing ISO 20000-1:2018 [11].

2. Resource and Method

Systems thinking approach is an alternative form of analytical thinking that breaks down problems into the smallest components to be solved [12]. Some of our previous research was also enriched by system thinking, especially in planning mathematical models [13] [14] [15], distribution planning [16]. Even on a larger scale system can utilize the system approach to solve problems and understand the system [17] [18].

In this research, a system of thinking and the use of a system approach are also used in modeling the information system service system. SysML is a modeling language used to model this information system. Each standard sentence is analyzed and analyzed in order to get a picture of the process map and system design.

3. Result and Discussion

In the PDCA cycle, the first process is Plan and Do. That means planning the process and implementing the process. In managing information system services, there are also Plan and Do phases. ISO 20000-1:2018 clause 8 governs the operation of the service. Clause 8 can be a guidance or guide in the planning and implementation of information system services. The following will explain the form of implementation of that clause 8 for planning and implementation. The System map, using Block definition Diagram are shown in Figure 1.

![Figure 1. Block Definition Diagram of Currency Prediction](image)

Clause 8.2.1 instructs that the organization must coordinate and carry out processes so that services can be realized. Clause 8.2.2 is about service planning. This clause shows that organizations need to explore what the requirements of the service will be. In addition, in the plan, it is necessary to see how the priority of the service is and the relationship between one service and other services. Changes must
also be managed properly. Change needs to be prioritized when it relates to the interests of the organization and business.

Clause 8.2.3 Regulates the control of third parties involved. Clause 8.2.3.1 explains some rules about controlling the responsibility of the process. Criteria need to be applied in selecting suppliers. Some services provided from other parties must be documented what services are provided, service components, or processes provided to third parties. Even though the process is carried out by a third party, it still needs to be integrated and maintained harmony between processes that are controlled internally and externally. Clause 8.2.3.2 Explains the organization’s necessity to determine the procedures for controlling external parties. There needs to be a clear measure in evaluating performance.

Clause 8.2.4 regulates the management of service catalogs. The service catalog contains some information contained in standard documents. The catalog also needs to be organized so that it can be accessed by anyone. Service catalogs can be posted on the website so they can be accessed by customers and prospective customers. The service catalog needs to be agreed on in the 2011 version. While the 2018 version doesn’t need to be agreed with the customer. Whereas SLAs need to be agreed with the customer. Even for each customer can have different SLA requirements.

Clause 8.2.5 regulates asset management. Every asset that supports service delivery, must be managed properly so that it meets the requirements and guidelines that exist. For example the license used must meet existing regulations. Does not violate intellectual property regulations. Such a list of assets can be made and their compliance with applicable regulations.

Clause 8.2.6 deals with configuration management. Configuration Item (CI) must be defined and each service classified as CI. CI is an element that needs to be controlled to ensure that services can be provided. CI can be interpreted as an asset to realize services. Documents and equipment can be considered as CI’s. SLA can also be considered as CI. If every entity already has a CI then there is no need to be given a new CI identification. For example, human resources already have an employee ID number, no need to be numbered.

In the context of configuration management, links between other CIs need to be identified. This distinguishes between Configuration management and asset management. The benefit of this configuration is that it illustrates how the impact of changes on other CIs. As an example, a renewal of the UPS will be carried out, then identification will be approximately connected to any CI. The status of CI also needs to be explained so that it can be monitored whether it is still active or not. Need to verify configuration information.

The CI must contain several information attributes. As with other information, CIs must be properly tracked and stored. CI must be updated and monitored for compliance. This CI also needs to be accessible by every related service.

Clause 8.3 contains relations management and agreement management. Clause 8.3.1 explains what can be delegated to the supplier. Suppliers can carry out services, or parts of services, and can carry out processes that support services.

Clause 8.3.2 regulates business relationship management. This clause further regulates the process after planning and implementation, namely the process of controlling and repairing.

Clause 8.3.3 regulates service level management. The organization and customer need to agree on the service level. Service requirements need to be clearly documented. And this is the basis of SLA. SLAs also need to include tagset, workloads, and exceptions. For example, internet services can work with the assumption that there are so many users. Also for example displayed exceptions for example at certain times there will be a reduction in service quality.

There needs to be a process of monitoring, reviewing, and reporting on service level agreements. The process needs to include comparison of SLAs and their realization. There should also be a comparison between workloads that actually exist and those written on the SLA. If it turns out that the two indicators cannot be met, then an effort is needed to identify the improvement plan and analyze the cause.

Clause 8.3.4 regulates supplier management. Clause 8.3.4.1 regulates the management of external suppliers. While clause 8.3.4.2 regulates the management of internal suppliers.
In clause 8.3.4.1, it is written that, like the customer, the supplier must be monitored by at least one responsible individual. For each external supplier, there must be a contract document governing the collaboration between the organization and the external party. The contract needs to contain some information as stated in the standard documents from points a) to d). It is necessary to study the relationship between agreements with external parties and compliance with SLAs and risks.

Relationships with external parties also require well-defined and clear media. As with services to customers, the performance of external parties also needs to be monitored and followed up if not achieved. Contracts that have been made need to be evaluated and updated as needed. If there is a dispute between the organization and external parties, there needs to be handling and resolution.

Clause 8.3.4.2 regulates internal suppliers and customers who act as suppliers. As with external parties, internal suppliers need to establish agreements with organizations. Also if there is a failure to reach an agreement, it must be followed up and resolved.

Clause 8.4 Regulates the management of supply and demand. This clause governs budgeting and accounting for services, demand management, capacity management. Clause 8.4.1 regulates the budgeting and accounting of services. The budgeting process is indeed closely related to planning. But the accounting process is closely related to the control and follow-up process. So this is not explained in this paper. Clause 8.4.2 deals with demand management. More related to the control process and follow-up. Based on the history of capacity usage, it can be followed up with capacity planning in the coming period.

Clause 8.4.3 regulates capacity management. The capacity of each resource needs to be measured and its relation calculated in supporting services and service level services. The organization needs to provide sufficient capacity and conduct evaluations and follow up on its realization.

Clause 8.5 Includes the process of making services, their development, and transitions or changes. This clause covers change management, service design and transition, and release and deployment. Some processes include planning and implementation. Some other processes include control and follow-up. Clause 8.5.1 contains information about change management. Then this clause is not explained in detail in this paper.

Clause 8.5.2 regulates service design and transition. It includes service plans, service designs, and regulates builds and transitions. Clause 8.5.2.1 Plan new or changed services, is to set plans before live services. This plan includes several things contained in standard documents ranging from signs a) to signs h). This clause also regulates services that undergo deletion and transfer. This also needs to be considered.

Clause 8.5.2.2 Design, Set about how to design our services after live. The design must include points a) to g). Clause 8.5.2.3 regulates the build and transition process. Services that are built need to be made and go through the stages of testing, verification, and meeting the requirements. The service also needs to be in accordance with documented design. If it turns out there are requirements that have not been met, there needs to be a follow-up agreement from the relevant parties. Release and deployment need to be used when transitioning in a live environment. This transition process needs to be continually communicated to related parties. Clause 8.5.3 explains about release and deployment management. Each release needs to be classified into several classifications.

Clause 8.6 Explains resolution and fulfillment. Clause 8.6 covers incident management, service request management, and problem management. Clause 8.7 describes service assurance, which is how to follow up and maintain the service process. Both of these clauses also cover the process of control and follow-up so that they are not explained in this paper.

4. Conclusions
After reviewing the ISO 20000-1: 2018 clause 8 standard. A best practice of information system planning has been obtained. From these best practices, organizations can implement standards in their respective organizations. Block Definition diagrams have also been obtained. The Block Definition Diagram is needed if the implementation process will be carried out with a System Engineering approach, especially the Model Based System Engineering.
Some further research can be done. Research can be done on the procedure for implementing other clauses standard. In addition, it can be analyzed several other models of SysML in the context of implementing information systems.

5. Reference

[1] E. Chumaidiyah, W. Tripiawan and R. Aurachman, “Exploring the internal and external constraint of it business start up in Bandung, Indonesia,” International Journal of Innovative Technology and Exploring Engineering, 2019.

[2] E. Chumaidiyah, R. Aurachman and B. H. Sagita, “Strategy for Capability Development of Knitting Small Medium Enterprises Using SWOT Analysis,” in Proceedings of the International Conference on Industrial Engineering and Operations Management, Bandung, 2018.

[3] S. Guntara, B. Yogaswara and R. Aurachman, “Strategi Transformasi Pt Greeneration Indonesia Menuju Perusahaan Ramah Lingkungan Yang Unggul Dengan Pendekatan Matriks Boston Consulting Group,” in eProceedings of Engineering 4, no. 3, Bandung, 2017.

[4] G. Disterer, “Iso 20000 for IT,” Business & Information Systems Engineering, vol. 1, p. 463, 2009.

[5] A. Tanović and I. S. Marjanovic, “Development of a new improved model of ISO 20000 standard based on recommendations from ISO 27001 standard,” in 2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), 2019.

[6] S. Romadini, A. F. Santoso and I. Santosa, “Perancangan Sistem Manajemen Layanan Teknologi Informasi Pada Layanan Reseller Dan Dropship Bandros Menggunakan Iso 20000-1: 2011 Area General Requirements Dan Design And Transition Of New Or Changed Services (studi Kasus: Cv Kabita Informatika),” eProceedings of Engineering, vol. 5, 2018.

[7] B. Federowicz, “The project service management system according to ISO 20000-1 in a company providing services to the construction industry,” 2019.

[8] B. Barafort, “Integrated risk management process improvement framework in it settings based on ISO standards,” 2019.

[9] F. M. Siddiqui, “Digital Transformation of Modern Airports by Exploiting Fog as a Service Model,” in 2019 Integrated Communications, Navigation and Surveillance Conference (ICNS), 2019.

[10] T. Tagarev and D. Polimirova, “Main Considerations in Elaborating Organizational Information Security Policies,” in Proceedings of the 20th International Conference on Computer Systems and Technologies, 2019.

[11] D. Haven, “A Guide to ISO/IEC 20000-1: 2018 Service Management,” 2018.

[12] H. D. D. McNickle and S. Dye, Management science: decision-making through systems thinking, Palgrave macmillan, 2012.

[13] E. G. B. Kuncoro, R. Aurachman and B. Santosa, “Inventory policy for relining roll spare parts to minimize total cost of inventory with periodic review (R, s, Q) and periodic review (R, S)(Case study: PT. Z),” in IOP Conference Series: Materials Science and Engineering, Jakarta, 2018.

[14] R. Aurachman and A. Y. Ridwan, “Perancangan Model Optimasi Alokasi Jumlah Server untuk Meminimalkan Total Antrean pada Sistem Antrean Dua Arah pada Gerbang Tol,” JRSI (Jurnal Rekayasa Sistem dan Industri), vol. 3, no. 2, pp. 25-30, 2016.

[15] A. Desiana, A. Y. Ridwan and R. Aurachman, “Penyelesaian Vehicle Routing Problem (vrp) Untuk Minimasi Total Biaya Transportasi Pada Pt XYZ Dengan Metode Algoritma Genetika,” in eProceedings of Engineering, Bandung, 2016.
[16] B. M. Muttaqin, S. Martini and R. Aurachman, “Perancangan Dan Penjadwalan Aktivitas Distribusi Household Product Menggunakan Metode Distribusi Requirement Planning (DRP) Di PT. XYZ Untuk Menyelaraskan Pengiriman Produk Ke Ritel,” JRSI (Jurnal Rekayasa Sistem dan Industri), pp. 56-61, 2017.

[17] R. Aurachman, “Model Matematika Dampak Industri 4.0 terhadap Ketenagakerjaan Menggunakan Pendekatan Sistem,” Jurnal Optimasi Sistem Industri, pp. 14-24, 2019.

[18] R. Aurachman, “Perancangan Influence Diagram Perhitungan Dampak Dari Revolusi Industri 4.0 Terhadap Pengangguran Kerja,” Jurnal Teknologi dan Manajemen Industri, vol. 4, no. 2, pp. 7-12, 2018.