IT Operation Services: Impacts of Maturity Levels of IT Governance on Online Stores in West Kalimantan

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***Abstract*- The guarantee of reliable IT operation services in producing relevant, punctual, and accurate information relies on IT maturity levels. It is noted that smoothness and appropriateness of IT operation services influence rework of dissemination of information. This research included 65 online stores in West Kalimantan as the sample. Questionnaires with groups of domains of IT processes and Likert scales were used to collect the data. Managers marketing the products through online stores became the respondents. The research aimed to cognize impacts of maturity levels of IT governance on needs of IT operation services. Results indicate that values of maturity levels that are less than 2.51 are dominated by PO Domain (PO1, PO2, PO3, PO4, PO8, and PO9), AI Domain (AI4 and AI5), DS Domain (DS4 and DS5), and ME Domain (ME4). The lowest value (2.421) is at PO3 (determining IT directions). Meanwhile, the highest one (2.975) is at DS6 (identifying and allocating costs). These values of maturity levels become important indicators of perspectives on IT operation services to map structures, processes, and relationships. Management of IT resources through interrelationships of applications, information, infrastructure, and human resources is inevitably necessary.**

Keywords—IT Operation Services, IT Governance, Maturity Levels, Online Stores.

I. INTRODUCTION

The world is currently in revolution of Industry 4.0 or the fourth industrial revolution in which IT (Information Technology) becomes the basis of human life [1]. All activities remain unlimited due to the massive development of the internet and digital technology determining connectivity and movement of human and machine. The existence of IT leads to transformation of digital businesses in forms of online stores [2], provides opportunities of improving the segmentation and of expanding market shares, makes marketing content of digital products more effective, builds and strengthens relationships with customers, eases the search of products, needs low investment, and improves the management of operational costs [3].

Besides, online stores allow easy access of existing channels when selecting the customers. Business innovation has become an important program. This makes more flexible and more personal organizations when digitally offering products and services. It becomes easier for users to interactively seek for information without sending too many costs [4]. Business communication models of online stores are linked to roles of social media in representing the digital businesses [5], ensuring personalization with customers intensively and interactively to enhance customer satisfaction, and improving collectivism-based collaboration to strengthen cohesion of organizations when facing the challenges and environmental changes [6].

Building the relationships of interactive business communication in forms of online stores relies on the guarantee of reliable IT operation services in producing relevant, punctual, and accurate information. Consistent and fine IT operation services can enhance the performance and long-term competitiveness of organizations [7]. Dependency of IT operation services supports formulation of business strategy for competitive advantages [8]. IT application portfolios should be able to provide continual services with minimal impacts once interruption of IT services happens [9].

Recent research has documented success of relationships of IT operation services, service quality, and customer satisfaction [10]. Possessing IT operation services is indicated by reliable, quick, and accurate services [11]. However, the fact shows that organization expectations are unachievable. Thus, seriousness of finding out maturity levels of IT governance is needed [12]. Values of measurement results are fundamental since they ascertain appropriateness and guarantees of IT investment when satisfying the needs of effective and consistent IT operation services [13].

Maturity levels of IT governance represent to what extent the benefits of implementation of IT operation services in supporting business processes of online stores are. Maturity values show the achievement of performance of current IT operation services and expected maturity levels [14]. The difference becomes the benchmark used to cognize and to assess gaps existing in management of IT operation services. Maturity values can become the basis of conducting rework of dissemination of information [15].

Computation of maturity levels refers to COBIT 4.1 Framework based on domains of PO (Plan and Organize), AI (Acquire and Implement), DS (Deliver and Support), and ME (Monitor and Evaluate). This framework is generally applied as the guidance of determining the goals of controls and processes of IT needed in IT management [16]. COBIT 4.1 can bridge the gaps of the two kinds of controls through

control objective levels such as activities and tasks, processes, and domains. The focus on orientation of measured business processes and controls is emphasized to produce more accurate results [16, 17]. COBIT 4.1 produces actual and expected maturity values used as the evaluation method of IT process controls. Besides, it contributes to relationships of IT and organization needs, controls IT activities, and identifies IT resources and the management [17].

Research on maturity levels of IT governance crucially contributes to IT processes of each domain. Previous research was only apt to focus on evaluating maturity and recommended models of IT governance. The discussion was, for example, on online marketing of Micro, Small, and Medium Enterprises (MSME) products, i.e. fashionable clothes. Fairly big gaps between the second (repeatable but intuitive) and third (defined) levels were found. Basic problems were on the quality management process, prediction and management of IT risks, and system security [19]. This condition was nearly the same as the one existing in online businesses of cosmetic products focusing on continual services and capabilities to operate and use IT. The gap value at the second level (repeatable but intuitive) was cognized [20]. Maturity levels of IT governance of online businesses through social media also showed that the average of DS Domain at the third level (defined) ensured continual services [21]. The same thing happened to the lowest level of IT governance of retail businesses at the third level (defined) noting the capabilities to operate and use IT [22, 23]. So far, retail businesses have not possessed the control program of effective internal IT going through defined observation.

All of these maturity values measured were generally at PO and DS Domains and possessed averages at the third level (defined). AI and ME Domains were also discussed. Maturity values were standard and required arrangement and rework of building the elements of IT processes of each domain. Previous research had relationships and was conducted at the same sites. Moreover, analysis was only based on gaps of domains and did not link them all. Obviously, none of discussion and analysis of impacts of IT operation services has emerged. Values of maturity levels of IT governance become the measure of success of managing quality and configuration of academic information services [24].

Problems of this research are: (a) to what extent are maturity levels of IT governance in connection with IT operation services in marketing the content of products through online stores?; (b) how are the impacts of IT operation services on online stores based on measurement results of IT processes of each domain?; (c) what ways are to take to actualize better IT operation services based on maturity levels of IT governance?. This research also discussed implications of managerial aspects and models of IT governance processes in providing IT operation services. The research aims to cognize impacts of maturity levels of IT governance on needs of IT operation services for all domains as well as to achieve and improve maturity levels of IT governance of online stores in West Kalimantan.

II. Literature Review

A. IT Operation Services

IT operation services emphasize the definition, management, and delivery of IT services to support business goals and consumer needs [25]. A set of processes include planning, organizing, directing, and controlling the IT services [26]. These more specifically include initiation, design, organization, control, procurement, support, and service improvement of IT. Such processes give strategic values in forms of services and assure the effectiveness and efficiency of IT services [27].

B. IT Governance

IT governance is the form of responsibility of top management and an integral part of organization governance, including the decision rights and accountability framework applied to motivate the use of IT and ensure achievement of effective and efficient IT goals [28]. IT governance reflects the responsibility of boards of commissioners and managers of IT in formulating organization structures of business management and IT, strategy of businesses and IT, and processes of IT management so that organization goals are achievable [29]. Improving the IT governance requires interrelationships of structures, processes, and mechanisms [30]

C. IT Maturity Levels

Maturity levels of IT governance indicate the existence of existing problems and determination of the improvement priority. Maturity values are set as IT process profiles to recognize description of current and expected conditions [31, 32]. Maturity values fulfill maturity criteria of several levels [33]. They allow IT governance to cognize assessment of existing and expected conditions [34].

III. Research Method

This research was in the form of the survey with Research and Development (R&D) Method. In measuring maturity levels of each domain, COBIT 4.1 Framework was applied. The population covered 76 online stores in West Kalimantan. Unlike other areas, West Kalimantan is close to a Malaysian border and, therefore, causes competitiveness of online stores. Types of products were not distinguished. Managers marketing the products through online stores became the respondents. The sample (65 online stores) was determined by using Slovin Formula with 5% significance level. Instruments of data collection were grouped based on each domain in IT processes with Likert Scales [35]. Sheets of questionnaires were emailed or printed and given to the companies. Likert Scales were measured by using intervals of positive to negative gradation, i.e. strongly agree, agree, tend to agree, tend to disagree, disagree, and strongly disagree. Next, all of these answers were quantitatively converted by using ordinal scales and scores based on given answers.

Data obtained from respondents were processed by calculating maturity values of IT governance of each IT business process. Assessing and analyzing processes were different in terms of fulfillment criteria. Computation of maturity values of IT governance of each objective applied this formula: Index = {(sum of answers x maturity values):(sum of questions x number of respondents)}. Rounding indices were determined based on levels of the maturity model (Level 0 (zero/non-existent) to 5 (optimized). Following this, aggregation values of maturity levels were calculated. They were presented in the table and represented by using a radar chart on Microsoft Office Excel [36]. Rounding index scales of levels of the maturity model were shown in Table I.

TABLE I
ROUNDING INDEX SCALES

Scale	Maturity Level Model
4.51 – 5.00	5 – Optimized
3.51 – 4.50	4 – Managed and Measurable
2.51 – 3.50	3 – Defined Process
1.51 – 2.50	2 – Repeatable but Intuitive
0.51 – 1.50	1 – Initial/Ad Hoc
0.00 – 0.50	0 – Non-existent

IV. RESULTS AND DISCUSSION

Referring to measurement results of maturity levels of IT governance, it can be seen that all IT processes of PO, AI, DS, and ME Domains cannot avail IT operation services maximally when online stores are managed. The problems related to arrangement system of IT application portfolios cause fairly big gaps. Accordingly, user expectations cannot be fulfilled. Table II shows the recapitulation of computation of maturity levels of IT governance of each domain.

TABLE II
COMPUTATION OF MATURITY LEVELS

Domain	Process	Current Maturity Level
PO1	Defining strategic IT planning	2.485
PO2	Defining information architecture	2.425
PO3	Determining IT directions	2.421
PO4	Defining IT processes, organizations, and their interrelationships	2.485
PO5	Managing IT investments	2.623
PO6	Communicating goals and directions of the management	2.652
PO7	Managing IT resources	2.625
PO8	Managing the quality	2.437
PO9	Predicting and managing IT risks	2.433
PO10	Managing projects	2.678
AI1	Identifying automatic solutions	2.753
AI2	Obtaining and maintaining application software	2.946
AI3	Obtaining and maintaining IT infrastructure	2.877
AI4	Allowing operation and use	2.456
AI5	Fulfilling IT resources	2.459
AI6	Managing changes	2.742
AI7	Installing and accrediting solutions and changes	2.520
DS1	Defining and managing service levels	2.704
DS2	Managing services of third parties	2.655
DS3	Managing performance and capacities	2.675
DS4	Ensuring continual services	2.488
DS5	Ensuring system security	2.423
DS6	Identifying and allocating costs	2.975
DS7	Educating and training users	2.864
DS8	Managing service desks and incidents	2.688
DS9	Managing configuration	2.929
DS10	Managing problems	2.763
DS11	Managing data	2.886
DS12	Managing physical environment	2.867
DS13	Managing operation	2.572
ME1	Supervising and evaluating IT performance	2.663
ME2	Supervising and evaluating internal control	2.865
ME3	Ensuring fulfillment of external needs	2.687
ME4	Providing IT governance	2.481
Average		2.653

Based on calculation of IT maturity, the whole domains generally possess the average of 2.653 categorized in the interval of 2.51 – 3.50 and Level 3 (defined process). The fulfillment of IT maturity values is essential in that IT operation services become an integral part based on the composition of actualizing IT governance when running the online stores. It is noted that IT governance requires the management and measurement of procedure appropriateness as well as fine actions if processes do not run effectively. It is found that processes are constant and have system providing good practices.

Nevertheless, the maturity values cannot represent each IT process of domains. Several IT processes are at Level 2 (repeatable but intuitive). At this position, every business process is developed based on procedures and followed by different people with the same profession. However, formal training and standard communication do not exist. Also, responsibility directly passed to every individual relying on prior knowledge causes mistakes.

IT processes with maturity values that are less than 2.51 are consecutively dominated by PO (PO1, PO2, PO3, PO4, PO8, and PO9), AI (AI4 and AI5), DS (DS4 and DS5), and ME (ME4). The least value (2.421) is at PO3 (determining IT directions). The foci are on effectiveness and efficiency becoming crucial elements once IT operation services of online stores are actualized. These can certainly become threats and directly influence processes of providing IT operation services. It is also found that the researched online stores have not possessed capabilities to determine IT directions so that the use of IT application portfolios is unclear

and unstructured. Such the problem reflects the IT process with the biggest gap. Hence, it should be solved to improve other processes (see Figure 1).

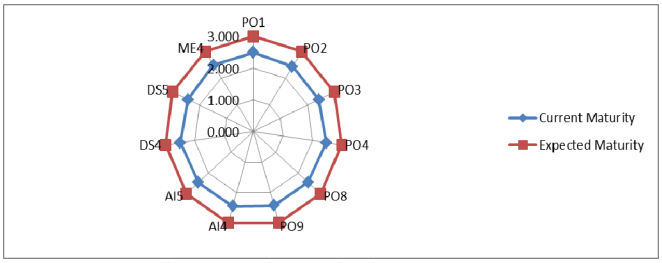

Fig. 1. Maturity Levels of IT Governance

Meanwhile, the biggest maturity value (2.975) is found at DS6 (identifying and allocating costs). It reflects the foci on efficiency and reliability and indicates capabilities to identify and allocate costs used to manage information to achieve IT operation service levels. It is true that the maturity value does not reach Level 4 (managed and measurable) yet.

The measurement results bring significant impacts on PO Domain because values that are less than 2.51 are found at PO1, PO2, PO3, PO4, PO8, and PO9. It can be generalized that strategic IT planning is inconsistent with the needs of processing and directing all IT resources. This leads to obscurity of work procedures and performance of other IT processes of each domain. Then, availability of unresponsive, unstructured, and less secure information further causes discrepancies of IT processes when providing punctual and relevant IT operation services and difficulties of making decisions. In addition, functions of IT operation services become undirected and irrelevant when determining directions of technology to support business aspects such as system architecture, acquisition planning, standards, migration strategy, and contingencies. Also, unresponsive adaptation of competitive online business environment happens. Another finding is that definition of IT processes, organizations, and their interrelationships complicates the consideration of needs of staff, skills, functions, accountability, authority, roles, responsibility, and supervision. It should be further noted that involvement of executives and management becomes ineffective, the lack of controls make IT operation services not transparent, and partial statements of quality, procedures, and policies create disintegration of information services.

Regarding other processes, i.e. AI4, AI5, DS4, DS5, and ME4, IT operation services are not supported with definition of operational needs and service levels, manuals of use procedures, and training materials. Furthermore, procurement of IT resources, human resources, software, hardware, and services still needs definition and enforcement of vendor selection, contract arrangement, and acquisition so that integration, synchronization, and mechanisms of IT operation services are comprehensively implemented. Moreover, procurement of IT operation services is not continually applied to ensure the management of IT service disruptions. Besides, the system of security management and protection of IT assets lead to complications of processing IT operation services and implementing corrective actions of each incident. These conditions cause vulnerability and handling of incidents. Other results indicate that managers cannot regularly recognize needs of IT management through fine control guarantees, an internal IT control is conducted by financial auditors without actively reflecting the needs of information service functions and contributing to formulation of IT operation services, and roles of leadership are limited to structural and organizational needs.

In order to actualize system of IT governance by referring to expected maturity levels, renewal is needed. There should be programs of educating the executives on how to deal with new technology and future directions, use opportunities of IT, manage the funding, and ensure fine IT business directions. Other important aspects are integration of IT strategy and businesses implemented based on goals as well as capabilities to see opportunities and weaknesses. More things to apply are that IT-based strategy of online businesses gets recognized, strategic portfolios of IT planning describing IT initiatives are made, and the use of IT resources is supervised and controlled through project analysis of IT operation services.

Selecting kinds and characteristics of IT properly need to be started with definition of clear and realistic IT needs on expectations of running online businesses in the next five to ten years, especially on feature models, service types, and mechanisms so that IT operation services are maximally reachable. Besides, system architecture, IT philosophy, procurement, IT investment, conduct standards, migration strategy, and the contingency approach should be periodically concerned. Developing management system of online business quality should assure the capabilities of IT to provide values comprising profitability, continual progress, and information transparency for stakeholders and managers.

Concern of system security should be an inseparable part of all users of IT operation services. The negligence of this matter can bring negative impacts on digital businesses. Periodical examination is also needed to ensure not handled system security. The vulnerability of portfolio system of IT applications should be identified. The security building the public trust can be maintained by managing infrastructure assets of IT application portfolios.

Training and education for users are very critical factors determining fine use of system. Weaknesses based on computation of maturity values occur as only some users and staff can understand IT application portfolios supporting the marketing of products. Therefore, developed IT system should be comprehended by users through education and training. The effectiveness of planning and implementation of these two programs are associated with determination of competence-based needs and evaluation of participants' performance.

The system should run continually. Thus, mechanisms of a backup model, the use of website redundancy, and the development of BCP (Business Continuity Plan) and DRP

(Disaster Recovery Plan) are required. There should also be reserved system planned, developed, and tested.

Defining policies and procedures, changing indicator values of performance, and adding control objectives should exist until management of IT processes fulfill fine standards. Furthermore, IT application portfolios should provide continual IT operation services with minimal negative impacts if interruption of IT services happens.

Apart from improvement of IT process performance, the management should take corrective actions on inappropriateness of existing processes and standards so that similar problems stop occurring in the future. The improvement of the management of IT processes, capabilities to determine indicators of performance measurement, and understandability of IT operation services to expedite information of online shops should emerge. Also, sustainable involvement of the management and users of each IT process is needed. For example, interrelationships of IT processes of all domains in IT governance should be formulated. The result obviously indicates that maturity values of IT governance of all IT processes are less than 2.51. Therefore, proper coordination applied to achieve synchronization and interoperability of fine IT operation services is required. In addition, processes of input and output control objectives should be interrelated so that there is a fine flow of information.

A final process necessarily pertains to organizational structures, IT management processes, leadership models, roles, and responsibility. These facets can ensure IT implementation that is consistent with strategy and goals of online stores. There should further be development and adjustment of indicators of IT governance and IT performance as well as documentation and communication of procedures, standards, and policies. Ultimately, measurement of IT governance is documented, management of cooperation with rules is integrated, reporting media covering strategy and programs of IT investment are prepared to monitor and evaluate funding, and obvious accountability is possessed to evade the breakdown of an internal control. IT portfolio investment remaining the focus should go through consideration of possible risks and refinement.

V. Conclusion and Future Research

To conclude, most online stores in West Kalimantan have not clearly mapped strategic planning pertaining to needs of processing and managing IT resources when ensuring IT operation services. Hence, Functions of IT operation services are not in line with determination of technological directions supporting the businesses (PO3). Similar things happen to these processes: AI4, AI5, DS4, DS5, and ME4 indicating that needs and levels of IT operation services have not been defined properly based on strategic business goals. Moreover, IT operation services are not continual. Internal IT control evaluation is still a part of a financial audit without reflection of formulating IT operation services.

In order to actualize IT operation services with expected maturity levels, updates are needed. Executives should further receive education on IT governance and make conformity of IT strategies and IT businesses so that portfolios of IT operation services are obviously formulated. Furthermore, system vulnerability of IT application portfolios requires identification and management through discipline of managing infrastructure assets. It is the fact that marketing through online stores needs assurance of security and fine IT operation services.

Future studies can include online businesses with categories based on business scales. Besides, products offered can contribute to attitude based on classification of each segment of the public. It is noted that ranges of IT infrastructure and management of online stores through integration of data, applications, and IT based on the relationship of IT processes are still rarely discussed.

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