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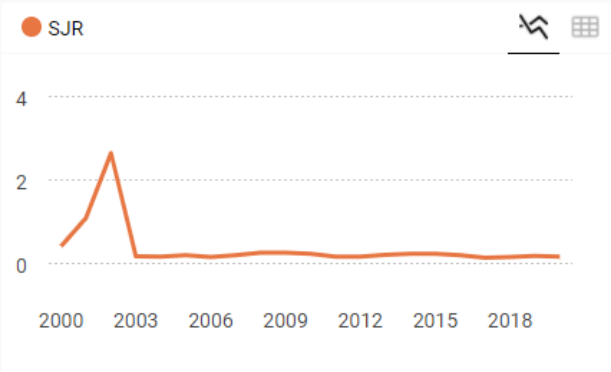

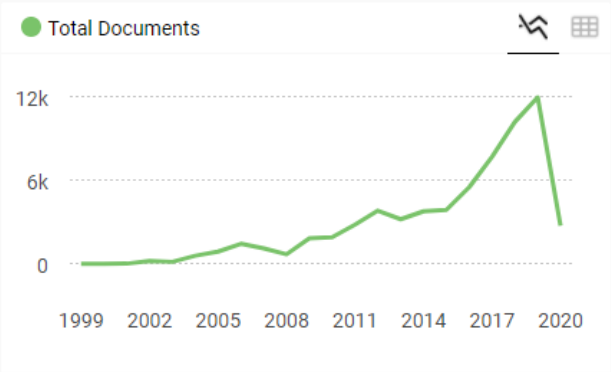

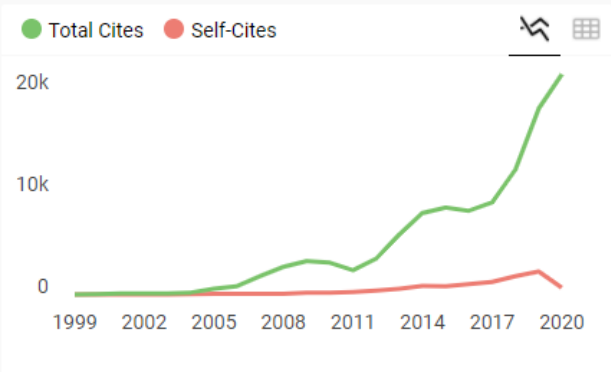

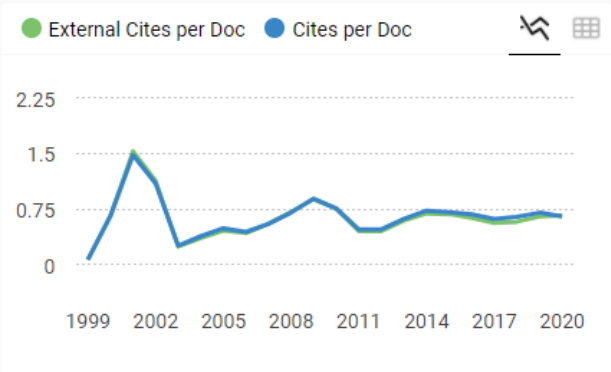

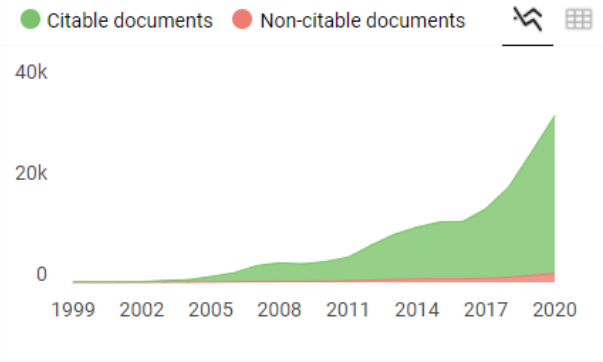

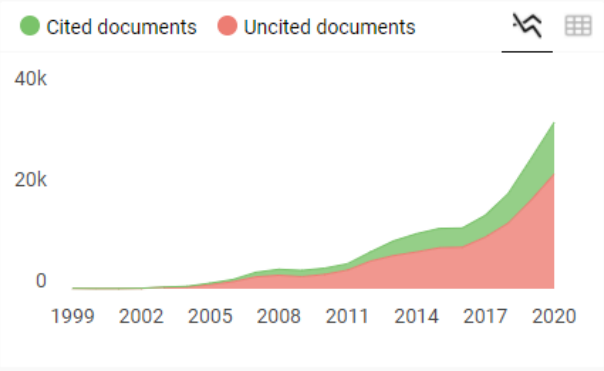

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ICEMT '17: Proceedings of the 2017 International Conference on Education and Multimedia Technology

2017 Proceeding

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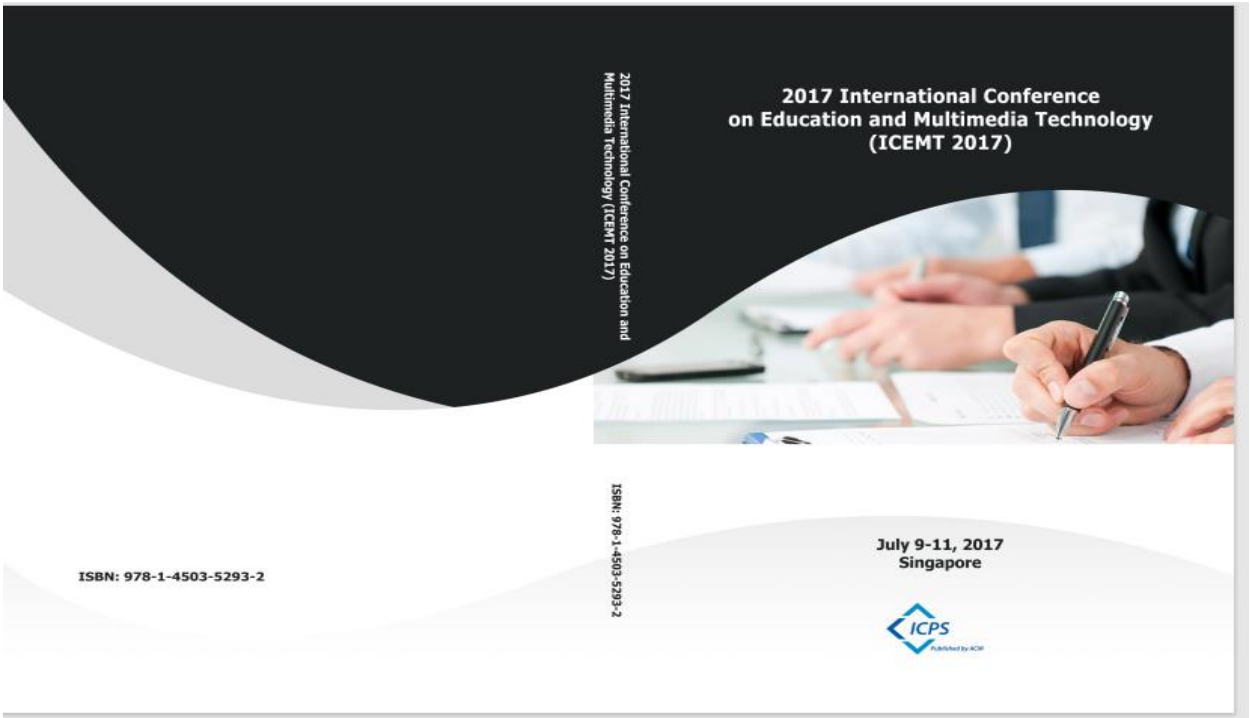

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Proceedings of 2017 International Conference on Education and Multimedia Technology (ICEMT 2017)

- ***Session 1- E-Learning and E-Education***

Preface

This volume contains papers presented at 2017 International Conference on Education and Multimedia Technology (ICEMT 2017), which was held in Singapore during July 9-11, 2017.

ICEMT 2017 provides a scientific platform for both local and international scientists, engineers and technologists who work in all aspects of Education and Multimedia Technology. In addition to the contributed papers, internationally known experts from several countries are also invited to deliver keynote speeches at ICEMT 2017.

The volume includes 18 selected papers which were submitted to the conference from universities, research institutes and industries. Each contributed paper has gone through a rigorous blind peer-review process. They were reviewed by at least two experts who are qualified within this field of E-Business and Internet. The proceeding tends to present to the readers the newest researches results and findings in the related fields.

The chairperson of each session played an important role in guiding the sessions in a timely and efficient manner. To improve the papers and ensure the quality, the reviewers also made great efforts in the given time. Then on behalf of the conference committee, we'd like to express our sincere appreciation to them for their contribution.

We truly believe the participants will find the discussion fruitful, and will enjoy the opportunity for setting up future collaborations.

Best Regards

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The Influence of ERP System to the Company Performance Seen through Innovation Process, Information Quality, and Information Sharing as the Intervening Variables

Widjojo Suprapto
Lecturer Business Management
Faculty of Economics
Petra Christian University
Siwalankerto 121-131,
East Java Indonesia
+62312983242
joe.suprapto@petra.ac.id

Zeplin Jiwa Husada Tarigan
Lecturer Master of Management
Faculty of Economics
Petra Christian University
Siwalankerto 121-131,
East Java Indonesia
+62312983244
zeplin@petra.ac.id

Sautma Ronni Basana
Lecturer Financial Management
Faculty of Economics
Petra Christian University
Siwalankerto 121-131,
East Java Indonesia
+62312983244
sautma@petra.ac.id

ABSTRACT
Enterprise Resource Planning (ERP) system is an integrated information technology that combines all departments in a company with a single data entry. The ERP system is used to obtain quality information so that the head of the companies can easily make decisions accurately and timely. The information is also distributed among all related departments through sharing information. The quality information can improve the innovation process and company performance. Based on the questionnaires distributed to manufacturing companies in East Java and the data processed by SEM PLS, there are several conclusions. First, the ERP directly influences the information sharing but does not significantly influence the information quality. Second, innovation sharing influences directly the information quality and innovation process, but it does not give impacts to the operational performance. Third, the innovation quality has an impact on the innovation process and the operational performance. Fourth, the innovation process has a positive and significant impact directly to the operational performance

CCS Concepts
Information systems → Enterprise resource planning.

Keywords
Keywords: ERP system, information sharing, information quality, innovation performance, and operational performance.

1. INTRODUCTION
The Enterprise Resource Planning (ERP) system is an important tool for business process planning, information flow, execution and controlling a company's resources which are financial, material, equipment, and human resources [1]. The main objective of ERP is to integrate wide range resource information to synergize business partners, customer needs, and company performances. It can be defined as the integrated solution between business process and management functions. Meanwhile, the ERP system can be defined as a package of business software that enables a company to automate and integrate major business processes and to share data in the whole company in order to create and access information in each department in real time, and the data input is done only one time to maintain the accuracy, which becomes the objective of installing ERP system. Information sharing is an important issue in many companies. The importance of information sharing is needed to maintain the accuracy and the completeness of good information [2]. In doing the information sharing among the supply chain partners, it gives many benefits to the management of information, from the information of logistics to financial returns and product turn-over. The concept of collaboration in the research of Jones et al. [3] reveals that the knowledge and information owned by companies do not guarantee the creation of innovation. Research conducted by Bassellir and Benbasat [4] states that the implementation of information technology will increase the competency of a company, therefore the innovation process can run smoothly as it gives spaces for adaptation to increase the business practice of the company. The company performance improvement with the ERP system can influence the business process of a company because all internal and external I formation needed by the company can be accessed with the integrated system so the departments can easily exchange and share the information accurately and fast [5]. Finally, information sharing and information quality become the main keys for the competitive advantage of the companies. Information sharing becomes one factor that enables the company performance can run smoothly [6].

This research is conducted after some observations on the ERP implementation in manufacturing companies in East Java, Indonesia, where the implementation of ERP is decided by the top management without the consent from the middle managers. Most of the time, the middle managers are forced to implement the ERP system without knowing the bigger process or scheme, but they have to obey to the high level managers, especially in preparing the shared data. The head of departments or the middle managers still mostly do the report manually, and often rely heavily on the manual reports than the ERP system. This condition will delay the

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operational processes, which affect the innovation process as well. Synchronizing data among departments can be troublesome because the quality of the data are poorly managed. With the implementation of ERP in many manufacturing companies, the middle managers are forced to synchronize the data so that other departments can make use of the data. The process of synchronization gradually improves the quality of the data, which later on helps the top management to make decisions in innovating new products. Therefore, this research is going to investigate the influence of ERP system to the company's performance which is seen through the innovation process, the information quality, and the information sharing as the intervening variables.

2. THEORETICAL BACKGROUND

2.1 Information Sharing

The flow of information is always related to the movement of information or data in each department in a company. The information can be in the forms of data, information, and knowledge. Sharing information becomes the key factor in an internal organization to maintain its competitiveness. The understanding of information sharing can increase the competitiveness and the profitability of the company. Research in supply chain management states that the information flow is very crucial for the organization, because it is related to the information movement or data among members, including top management, and even when needed, to the business partners within the supply chain[6]. There are some indicators for information sharing that can be used, such as discussion among departments in a company [6], sharing knowledge among departments [5], [6] and data integration among departments [7].

2.2 Information Quality

Information quality is a measurement of the value of the existing needs which has been set up through the organized and processed data so that it can create a useful information for the users. The existing information is not always useful for the users. The information must be selected and evaluated according to the needs of the users. Li and Lin [8] state that the quality information is the information that complies these aspects: accuracy, completeness, timeliness, and relevance.

2.3 Innovation Process

Obeidat et al. [9] state that innovation is an introduction to a new configuration of the important production factors to the production system. The capital innovation is the company competency and R&D implementation in carrying out new technology and new products to fulfill the market needs, in which it includes new products, new technologies, new markets, new materials, and new combinations.

According to Gloet and Teriovski [10], innovation can be described as an implementation of the innovation, and intervene the findings to the company's operational processes to generate new products and systems. Plessis [11] considers innovation as a creation of new knowledge and ideas which are implemented to generate new business. It aims to improve the company's internal business processes and corporate structure and to create new markets for goods and services. Innovation process is the implementation of new things in the framework of the company's operations that include the improvement of product quality and new methods in delivering processes (including technical, methods, and software changes), the changes and improvements in order to enhance the quality of the goods or services from the manufacturing processes or logistic system, the dismissal of existing processes, or simple replacement or extension that provides some results in the form of the price, customization, seasonal trends, and other changes. Indicators that can be used to measure the innovation process are the introduction of new processes, the use of new technologies, and the ease of using the technology.

2.4 Operational Performance

Simatupang and Sridharan [12] outline three criteria in measuring the operating performance of a company within the supply chain; among others are fulfillment, inventory, and responsiveness. Fulfillment serves to identify the ability of a company to meet the customer demands in terms of the promptness of the delivery time, the accuracy of the requested product specifications, and the conformity of the quantity of demanded goods. Inventory means to identify the ability of a company to perform inventory management that includes the inventory turnover rate, the reduction in inventory quantity, and the reduction of the inventory costs. Responsiveness serves to identify the ability of a company to respond to the customer demands which includes the reduction of the waiting time, the flexibility in accommodating the demand, and the sensitivity to the customer demand. According to Melville et al. [13], the company's performance is a measure of the company's success both financial and nonfinancial. Operational performance is a measurable aspect of the results of the organization process that determines the size of the business scope. Operational performance is measured through five indicators, such as cost reduction, cycle time reduction, productivity improvement, quality management, and customer service improvement [14].

2.5 Conceptual Framework and Hypothesis

Ince et al., [1] write that the ERP system in a wider scope has an influence on the performance of the company, and the ERP system also has an influenced on the information sharing [15]. ERP system is a system that cans automatically interaction the company with its suppliers and customers along with updates information exchanges so that it can increase the efficiency in procurement and customer relationships [14]. In the end, the ERP system provides some good business innovations. The achievement of the company performance obtains some innovation processes through information sharing and information quality that has been implemented in the company using the ERP system (Figure 1).

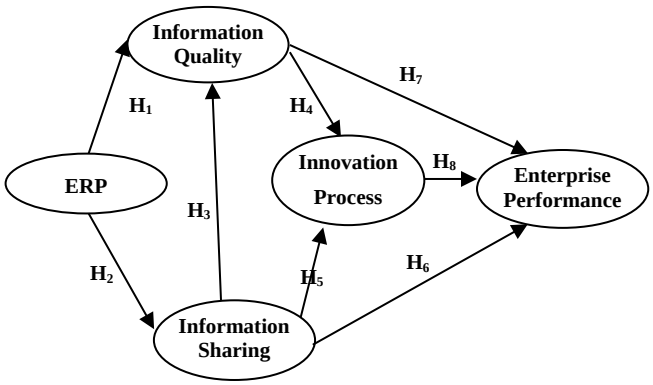

Figure 1. The research conceptual framework

Based on Figure 1. several hypotheses are constructed as follows:

H_1: the implementation ERP system influences the information quality.

H_2: the implementation ERP system influences the information sharing.

H_3: the information sharing influences the information quality.

H_4: the information quality influences the innovation process.

H_5: the information sharing influences the innovation process.

H_6: the information sharing affects the company performance.

H_7: the information quality affects the company performance.

H_8: the innovation process affects the company performance.

3. RESEARCH METHOD

The research is a quantitative research to investigate the causal relationship between independent variables with dependent variables, and dependent variables with other dependent variables. The population of this research is the manufacturing companies in East Java, Indonesia. The respondents are the key users in the companies. The definition of the key users is someone working in a project team and having access in making changes directly on the working procedures in the section or department. Besides, the key users are a person chosen to be the coordinator or project manager who uses the data from the ERP system. To collect the data, questionnaires are distributed to manufacturing companies by visiting each company's ERP key users or departmental managers. After the data are collected, they are analyzed using the SEM PLS with the calculation process assisted by application software Smart PLS [16]. From the returned questionnaires, there are 103 valid questionnaires that can be further processed.

4. FINDING AND DISCUSSION

The evaluation is conducted by using software Smart PLS. The path analysis in PLS describes the relationship between latent variables and indicators within the outer model. The evaluation of the structural models (inner model) is conducted to determine the relationship between variables. Ooutputs from the hypothesis testing is as follows in Table 1.

Table 1. The relationships between variables Inner Model

	original sample estimate	mean of subsamples	Standard deviation	T-Statistic
ERP -> IQ	0.116	0.130	0.125	0.928
IS -> IQ	0.684	0.693	0.102	6.698
ERP -> IS	0.453	0.475	0.096	4.692
IQ -> IP	0.281	0.289	0.089	2.132
IS -> IP	0.225	0.335	0.104	1.883
IQ -> OP	0.363	0.398	0.203	1.989
IS -> OP	-0.107	-0.106	0.193	0.557
IP -> OP	0.507	0.102	0.077	2.252

Based on the results of the data processing shown in Table 1. above, it is obtained the following results. The first hypothesis is accepted, that is ERP having an influence on information sharing with the value of t-statistic (4.692) > 1.65, and the estimated value of direct effect is .453. This is due to the implementation of ERP enabling the company to integrate various data among departments and other departments to utilize various shared data to make decisions. This research supports research by Omar et al., [2] which states that the information sharing requires IT as important tools in manufacturing industries.

The second hypothesis is rejected because there is no influence between ERP and information quality with the value of t-statistic (.928) < 1.65 and the estimated value direct effect is .116. This is due to the fact that ERP in the company is associated with the design of business process and standard operating procedures that are apparently not able to operate well in the whole departments. Sometimes, data are entered into the ERP system with incorrect data, and it is not at the time, and they are integrated with other data in the system which causes wrong analysis. As a result, the data cannot be used by the management to make any decisions. This result, however, is different from research by Omar et al., [2] which states that information quality requires IT in order to get a proper report or analysis requested by the management.

The third hypothesis is accepted as there is a positive and significant influence of information sharing on information quality in manufacturing companies with the value of t-statistic (6.698) > 1.65 and the estimated value of direct effect is .684. The information sharing built by manufacturing industries in East Java is always conducted on the first day of the working week by gathering all department heads who are related to the ERP implementation. In the meeting, they discuss the implementation problems occurred in the previous week. Then the IT department, as the responsible Department in implementing ERP, will explain the interconnected data and the interconnected synchronization so that each related department can fix the data in the ERP system. All department heads will follow up the result of the meeting by revising the wrong data and preventing the similar mistakes by following the already established procedures in the company. This research supports a research done by Marinagi et al. [17] which states there is a positive influence on the information quality on information sharing. This result also supports research by Omar et al., [2] who states that the information sharing and information quality are used together in implementing supply chain management.

The fourth hypothesis is accepted as there is a positive and significant influence between information quality and innovation process with the value of t-statistic (2.132) > 1.65 and the estimated value of direct effect is .281. This happens because the information quality can accelerate innovation processes, especially in creating new business ideas, in manufacturing companies. In this research, information quality covers the data accuracy, data completeness, and data appropriateness. This research is in accordance with the research by Srivardhanna and Pawlowski [18] which reveals that the implementation of ERP from the knowledge-based perspective brings an impact to the sustainability of the business innovation process, especially in implementing new ideas within an organization and in adopting new systems for the operational department.

The fifth hypothesis is accepted as the information sharing gives a positive and significant influence to the innovation process with the value of t-statistic (1.883) > 1.65, and the estimated value of direct effect is .225. This happens because the innovation process will run well if there is some information sharing among departments in a company. The company always conducts coordination and information sharing weekly to ensure the synchronization among departments. This research supports research by Tarafdar and Gordon [19] which describes the cross-functional project teams in doing the collaboration with

information sharing to increase the innovation process. This collaboration is achieved through the sharing of project plans and project performance. This research is also in accordance to research by Lotfi et al. [20] that mentions information sharing in a company, within the scope of supply chain management, improving the performance and efficiency of the manufacturing companies.

The sixth hypothesis is rejected because the information sharing has a negative influence and no significant to the operational performance with the value of t-statistic of (.557) < 1.65 and the estimated value of direct effect is -.107. This happens because many key users are distributing the shared data to various departments which still process the data manually. Besides, there are many key users who are not able to comprehend the integrated data because the ERP system is relatively new for manufacturing companies. This result of the research differs from research by Marinagi et al., [17] which states that the information sharing significantly influences the supply chain performance.

The sevenths hypothesis is accepted as the information quality has a positive and significant impact on the operational performance with the value of t-statistic (1.989) > 1.65 and the estimated value of direct effect is .363. This is due to the availability of accurate data and precise time helps the company top managers make an appropriate decision for business development. This research supports the result of Li and Lin (2006) which states that information quality contributes to customer satisfaction. This research also supports research by Marinagi et al., [17] which describes that information quality significantly influences the supply chain performance.

The eighth hypothesis is accepted because the innovation process has a positive and significant impact on the operational performance with the value of t-statistic (2.252) > 1.65 and the estimated value of direct effect is .507. This is due to the innovation of the company that brings satisfaction to the consumer, good product quality, and precise delivery time. This result supports research by Jackson et al., (2016) [21] which mentions that the innovation of the company on goods and processes have a positive impact on the company performance.

5. CONCLUSION

Based on the results of the data processing and analysis, there are several conclusions as follows:

1. The ERP implementation can increase the information sharing in the manufacturing companies in East Java.
2. The implementation of ERP in the companies has not yet improved significantly the information quality because many data entries submitted by the key users are incomplete and late.
3. The information sharing can improve the information quality because there are some data rechecking processes by other departments which use the same data.
4. The information quality brings positive impacts to the innovation process as the needed information can be obtained fast and complete in the company.
5. The information sharing also brings positive impacts to the innovation process because there are meetings and discussions to synchronize the sharing knowledge among departments.
6. The information sharing, however, does not influence directly and significantly to the company performance because the information sharing among departments is still in the stage of synchronizing the data, and not yet in the stage of utilizing and collaborating the data among departments.
7. The information quality gives a direct impact on the company performance in East Java because the accurate, complete, on time data improves the proper decision making in cost reduction, cycle time reduction, productivity improvement, quality management, and customer service improvement.

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