

# The Influences of ERP Implementations to SCM in Increasing the Performance of East Java Manufacturing Companies from the Accounting/Financial Manager Perception

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**Abstract:** ERP (Enterprise Resources Planning) is an integrated information technology system for manufacturing companies, and is used to increase company's performance. Indonesian business owners believe that the use of e-business technology can to increase the performance of the company, particularly in accelerating the efficiency in the operational sector. After successfully implementing ERP, business owners have to implement SCM (Supply Chain Management) to maintain partnerships with suppliers and provide satisfaction to the consumer. These two systems should be integrated in order to be a synergy for the company system and provide improved performance. This research has four main questions. First of all, how is the implementation of ERP in East Java manufacturing companies nowadays? And, how is the implementation of SCM in East Java manufacturing companies nowadays? Then, how to integrate ERP and SCM systems to companies in order to provide improved performance in the company? Finally, how is the commitment of managers and employee empowerment effect to performing the integration and combination of these two systems? This research will answer these four questions by doing interviews and collecting questionnaires from practitioners and direct observations to companies in Surabaya, Gresik, Sidoarjo, Pasuruan, and Mojokerto. This research is using the Partial Least Square (PLS) software for analysis hypothesis.

**Keywords:** Commitment management, employee empowerment, supply chain management, enterprise resources planning, company performance

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## Introduction

The competition between companies in the world is getting more complex. To increase the number of consummates, many companies implement quick services and cheap expense to raise competitiveness (Shebab *et al.*, [13]). One of the ways to be successful in competition can be done by integrating information system, increasing the efficiency of information system to produce a more efficient management in *business processes* (Shebab *et al.*, [13]). The impact of efficiency in this management is expected to increase competitiveness in the competitive market (Tsamantanis and Kogetsidis, [21]; Suprijanto, [19]).

The problem is that, up to the present time, there are still companies which haven't integrated information system in their organization management. For all this time, the process of those companies is only supported by individual activity at local offices (Warta Ekonomi, [23]). This fact can provoke misunderstanding in data communication between working locations with other working locations. Each individual will deliver data at their own working location, which means, there might be basic difference in delivering data, so it takes lots of time for coordination in supplying data compared to compa-

nies which have integrated their functions. Data which has been integrated can help a more efficient business and ease decision making by company's management (Shebab *et al.*, [13]).

One of technologies which has role in integrating each fuction is *Enterprise Esources Planning* (ERP). ERP technology can integrate marketing function, production function, logistic function, finance function, and other functions (Baheshti, [2]). ERP has developed as an integrated tool, it has purpose to integrate all company's applications to the main data storage which can be easily accessed by departments which need it (Sabana, [12]). According to Leon [10] as expressed by Genoulaz and Millet, [6] data integration in ERP is done with *single data entry* which is a department which has function in entering data, so that these data can be used by company's other functions.

*Enterprise Resource Planning* (ERP) is a method used to manage company's resources by using information technology (Spathis and Constantinides, [17]). Usage of ERP technology is equipped with hardware and software. This technology has function to coordinate and to integrate data information at each area of *business processes*, resulting in fast

decision making because it provides quick financial analysis and report, on time sales report, production and inventory report. (Gupta, [7]). Different point is suggested by Bradford and Florin [3] who state that there is no influence by *technical compatibility technology* ERP in work satisfactory and key user's effectiveness on ERP's hardware and software.

ERP is very helpful for company which has wide business process by using divided management of database and reporting tools. *Business processes* is a group of activities which need one or more type of input which will produce output as value for consumers. ERP's software supports efficient operation of *business processes* integrating all activities of the whole business which includes sales, marketing, manufacturing, logistic, accounting, and staffing (Leon, [10]).

Implementation of ERP pada Indonesian companies has expectation in accelerating business, improving efficiency, and to gain larger income (Warta Ekonomi, [23]). The problem occurs when there are many factors which can fail the process on the implementation. These factors are management doesn't provide the best team project in implementation project which are related to members' competences, credibility and team project's creativity, effective team leadership, team's commitment, team's responsibility, sufficient number of team member, overlapping responsibility in team, unclear job approach, goals which are not understood by team project.

The application of various electronic business solutions which is known as *e-business* in Indonesia has been developing since 2002. Financial division is the most related department to this application. In the middle of 2002, Indonesian entrepreneurs was sure that using *e-business* technology can fix company's performance, related especially to efforts in making company's operational performance to be efficient. (Warta ekonomi, [23]). A research done by Warta Ekonomi shows that around 54.2% of companies which participated as respondents had applied various *e-business* application/solution which are *enterprise resources planning, supply chain management* and *customer relationship management*. On the same research, 31 of 33 company sample (93.9) stated financial division is the most related part to this application. The best position is taken by each application of marketing and production. Result of survey also stated that manufacture industry is recorded as the most active user of *e-business* application/solution, which is 41.9%. Company doesn't hesitate to state that utilization of *e-business* solution can raise company's productivity. This can be seen from the result of survey which stated that the

productivity of around 26 of 33 companies or 78% is increasing.

A research done by Huang dan Palvia [9] suggests 10 factors about ERP implementation by comparing developing country with developed country. They also add that information technology advancement, computer culture, business measurement, business process, re-engineering experience, and management commitment are factors which influence organization's level. However, Huang and Palvia [9] didn't categorize the factors which contribute in success and failure.

Result of early interview with some companies when taking field data states that at the present time companies have had stable ERP system and can be relied on for increasing company's performance. It is found out that ERP which is used by the company does internal control by increasing company's efficiency and effectiveness. And in the last 2 years, many companies have applied SCM (Supply Chain Management) in order to do company's external control which is to make partnership with supplier and to increase consumers' satisfactory.

At present time when the competition is very tight, company is responsible for the whole process, starting from designing product, predicting needs, logistic control, storage, and distribution/transportation to the distributor's centre, wholesaler, retailer, services for customers, payment process, and arrived at the last customer. To manage the flow of commodity and information of company's activities needs a concept which is Supply Chain Management (SCM). For the last few years, there are many organizations did betterment by increasing efficiency in company through supply chain activities which are purchasing, manufacturing, and logistic division (Wu and Wang, [24]). Stated that the concept of SCM can be applied at franchise outlet, where a manufacturer gives his product directly to an outlet and the outlet only chooses one manufacturer to supply his products. Vertical integration and exclusive relationship between manufacturer and *outlet (retailer)* is happened by applying SCM concept.

A research by Chang *et al.*, (2008) states that the firms by applying the concept of SCM in particular in manufacturing companies will have a positive impact on market share and profit thereby enhancing the competitiveness of enterprises meanwhile implementing SCM concepts and implementation of ERP technology can be operated simultaneously. Stated that implementation of SCM in USA have done collaboration and partnership with company's competitors with a goal to produce same efficiency on supplier to company in order to get reduction of cost.

Improving company's performance is done by implementing SCM which can't be separated from ERP's benefit which is gotten with the existence of company's commitment in management and employee's empowerment.

### Study and Hypothesis of Research

Based on conceptual framework improvised from the previous research and new researches, as the result, some relationship or influences between one variable of research with another variables from other researches are gotten. Bradford and Florin's research hypothesis [3] suggested whether top management gives full support toward team project in implementing ERP or not. Result of Bradford and Florin [3] showed that commitment of top management to support ERP's implementation team, especially function manager (key user) and user gives improvement in work effectiveness significantly. Job support given by the top management which is explanation on well communicated and explained company's vision and mission to the implementation team are obedience, loyalty, and participation will create good atmosphere for working condition in organization environment, from a more conducive condition, better work performance will be created.

Su and Chyan [20] stated that ERP's benefit has impact on company's SCM competence and it will be the basic research framework in this research. Zhang *et al.*, [25] stated about commitment of top management supporting usage rule on all staffs to avoid debate between users and providing a proper media to give positive and significant impacts in fastening the implementation process. Implementation process of ERP does not only change ERP's software but also to re-manipulate company's system in transforming to the course of best practical business.

Commitment of top management has positive influence in determining cost target that will be used and job quality concerning company's business process (cost reduction of process, time reduction of process, improvement of productivity) by monitoring reports from team project. With the presence of goal clearly made by top management will support work effectiveness of the team. Soja [15] stated that commitment of top management has positive impact towards the effectiveness of key user as member of team project in determining goal, need of additional employees, limitation of tool, grant support, project's stability, and participation of top management in implementation team. Umble *et al.*, [22] did an exploration about steps in implementing ERP, where the team project can understand about row of top management's vision in implementing ERP, while

row of top management can support team project. Top management's commitments in implementing ERP are allocating proper resources, determining right people in team project, providing capable people, and to give regular trainings for solving problems which have influence toward the effectiveness of key user.

While Xue *et al.*, [26] suggested that organization culture has positive impact toward ERP's failure caused by the presence of less trusted information data supply because spoken communication is more preferred; challenging cooperation in ERP caused by the usage of foreign language and difficulties in doing changes of business process which is done at the same time between team project and company's management. Park *et al.*, [11] stated that sharing knowledge in understanding ERP's systems which is measured by sharing knowledge indicator generally and specifically has positive impact toward key user's effectiveness which in it has productivity improvement of key user, performance improvement of tasks, decision effectiveness and implementation quality, plus time for making decision.

Research hypothesis of Bradford and Florin [3] whether *business process re-engineering best practice* on ERP has positive implementation on ERP when doing adjustment with company's process. Bradford and Florin [3] stated that *business process re-engineering* doesn't have influence toward work effectiveness and key user's satisfactory in implementing ERP at the company. Zhang *et al.*, [26] stated that *business process re-engineering* has positive impact toward *user satisfaction* and *individual impact*, because by redesigning processes on company by key user will ease adjustment between software with company's needs and it also has impacts on acceleration the implementation of ERP. Soja's research [15] stated that composition of team project consist of people who have qualification and knowledge about ERP and members' active involvement have positive influence towards acceleration process of designing ERP implementation. Amoako and Gyampah's research [1] stated that the changing in business design which is appropriate in using ERP technology has positive influence toward the work intensity of key user in ERP implementation .

Wu and Wang [24] stated that *key user's* satisfactory has significant influence toward ERP's technology product which consist of true data information produced by ERP's product, reliability of consistent information system which is produced by ERP's product, fast time respond which is produced by ERP's product, complete information which is produced by ERP's product, system's stability to ease customization, auditing, and system controlling, plus

data communication by integrating departments in the company. Result of Zhang's research *et al.*, [26] showed that *ERP software suitability* package has positive influence toward *user satisfaction* and *individual impact*, because it is able to decrease customization process and resulted in reduction of time and cost consumption in order to be agreeable with constancy of process in company.

Different with Wu and Wang [24], dan Zhang's researches *et al.*, [26], according to Bradford and Florin [3] there is no influence of *technical compatibility technology ERP* toward both work satisfactory and *key user's effectiveness* on ERP's *hardware* and *software*. Bueno and Salmeron's research [4] stated that suggestions from *key user* has positive impact toward ERP's existence. On the same research it is stated that key user's education has positive impact toward the effectiveness in using technology of ERP. Stated that key user's experience and attitude of desire in learning has positive impact in his work effectiveness in using technology of ERP. Umble *et al.*, [22] stated that data accuracy is absolutely needed in ERP's system, because the truth of data and accuracy of data is absolutely needed by the team project as a responsibility to the top management.

Bradford and Florin [3] stated that *business process re-engineering* has influence toward company's performance and it is not significant. While Sun's research *et al.*, [18] stated that procedure process which in it has agreement, documentation, integration and design process have influence in achieving goal generally and company's cost, plus quicker time planning. Zang *et al.*, [26] stated that *design process* has positive impact toward the achievement of company's performance and also toward acceleration of ERP's implementation which have implication on implementation cost and implications for improving the quality and speed of service. Technology implementations which become integration system in company are *Enterprise Resources Planning (ERP)*, *Supply Chain Management (SCM)* and *CRM (Customer Relationship Management)*. A research done by Hendricks *et al.*, [8] in USA toward 186 samples which have applied ERP in companies, 140 samples implemented SCM in their companies, 80 implemented CRM in companies by using benefit financial indicator. Hendricks' research *et al.*, [8] stated that the implementation of technologies that serve as the company's system can provide financial benefits and provide competitiveness for the company. Implementation of technology in company requires the support of all components of the company's top management, especially by doing coordination internally and collaboration with company's external party.

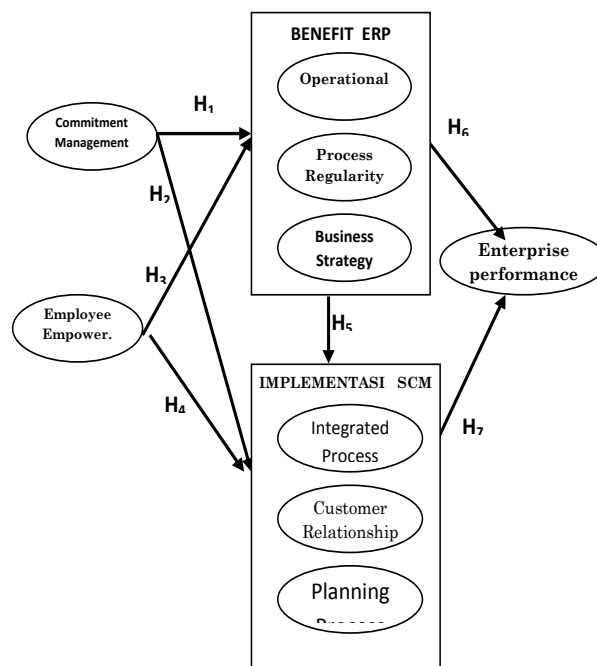


Figure 1. Conceptual framework

Based on the above explanation, conceptual research is built which will be submitted which are impact of company's top management's commitment and company's employee empowerment in implementing *supply chain management (SCM)* through gaining benefit of *enterprise resources planning (ERP)* for producing company's performance. Conceptual framework is drawn on Picture one Several research hypotheses obtained as follows:

- H1a = Management commitment variable affecting the benefit of ERP in the company's operation
- H1b = Management commitment variable affecting to the benefit of ERP on business process regularity
- H1c = Management commitment variable affecting to the benefit of ERP on business strategy
- H2a = Management commitment variable affecting to the implementation of SCM technology in the companies
- H2b = Management commitment variable affecting the customer relationship in the implementation of SCM technology in the companies
- H2c = Management commitment variable affecting the business planning in the implementation of SCM technology in the companies
- H3a = Employee empowerment variable affecting the benefit of ERP in the company's operation
- H3b = Employee empowerment variable affecting the benefit of ERP on business regularity process
- H3c = Employee empowerment variable affecting the benefit of ERP on business strategy

- H4a = Employee empowerment variable affecting the integration process in the implementation of company's SCM technology
- H4b = Employee empowerment variable affecting the customer relationships in the implementation of company's SCM technology
- H4c = Employee empowerment variable affecting the business plan in the implementation of company's SCM technology
- H5a = Dimension of ERP benefits to company operating variable affecting the integration process in the implementation of company SCM technology
- H5b = Dimension of ERP benefits to company operating variable affecting the customer relation in the implementation of company SCM technology
- H5c = Dimension of ERP benefits to company operating variable affecting the business plan in the implementation of company SCM technology
- H5d = Dimension of ERP benefits to business regularity process variable affecting the integration process in the implementation of company SCM technology
- H5e = Dimension of ERP benefits to business regularity process variable affecting the customer relationship in the implementation of company SCM technology
- H5f = Dimension of ERP benefits to business regularity process variable affecting the business plan in the implementation of company SCM technology
- H5g = Dimension of ERP benefits to company business strategy variable affecting the integration process in the implementation of company SCM technology
- H5h = Dimension of ERP benefits to company business strategy variable affecting the customer relationship in the implementation of company SCM technology
- H5j = Dimension of ERP benefits to company business strategy variable affecting the business plan in the implementation of company SCM technology
- H6a = Dimension of ERP benefits to company operating variable affecting the performance of the company
- H6b = Dimension of ERP benefits to company business regularity system variable affecting the performance of the company
- H6c = Dimension of ERP benefits to company business strategy variable affecting the performance of the company
- H7a = Dimension of SCM implementation that is company integration process variables affecting the performance of the company
- H7b = Dimension of SCM implementation that is company customer relationship variables affecting the performance of the company
- H7c = Dimension of SCM implementation that is company business plan variables affecting the performance of the company

## Methods

Type of research that will be used in this research explains the reciprocal relationship between the variables through hypothesis testing (Singarimbun, 1995). This study takes the source data from companies that have been registered at the Ministry of Industry and Trade of East Java (Industry and Trade) at the municipality level area of Surabaya, Sidoarjo, Pasuruan, Mojokerto regency and Gresik regency consisting of 324 manufacturing companies which are: 181 local investment companies and 143 foreign investment companies, there are more than 143 companies that have implemented ERP for 6 months. Of a population of 143 companies that have implemented ERP in the form of SAP, Oracle, Baan, Peoplesoft, JD Edwards, MFG Pro and development of an independent integrated information system in East Java will be determined which companies are to be sampled in the study. This study chooses the municipality / district because the number of manufacturing firms are concentrated in the region.

Determination of the number samples in this study, with a population of 143 firms (N) that have implemented ERP, with accuracy levels of 95% research ( $\alpha = 5\%$ ) and the proportion of the data of 0.5 (p) and the percentage of possible error estimation (B) in making a sample of 5%, then the amount of data (n) required is from 50 companies (Supranto, 2000).

Determination of the sample of 50 companies was conducted using the sampling propositio to determine which companies will be sampled. Consideration of sample selection of company is adjusted to the population proportion of all manufacture types or criterias in order to be represented (Table 1). Respondents were manager/project coordinator who serve as a key user companies in finance or accounting.

Measurement scale used in this study are Likert scale, with assessment intervals for each respondent's answer is an interval of 1 to 5 will be adjusted to the respondents' answers to questions, examples of alternative answers are used to improve the quality of performance, service improvement and increased effectiveness of information systems and efficiency of the internal management: a score of 5 = strongly agree, score of 4 = agree, score of 3 = disagree, score of 2 = does not agree, and a score of 1 = strongly disagree.

**Tabel 1.** Plan of survey research

Category of companies	Total of companies		Implementation of ERP		Survey plan
	PMDN	PMA	ERP	ERP	
			PMDN	PMA	
Food and Beverages	13	19	9	15	9
Household needs	4	4	2	2	1
<i>Furniture and processed timber</i>	44	19	8	9	6
Plastic products	16	6	6	4	4
<i>Packaging</i>	8	4	3	3	2
Livestock feed	7	1	5	1	2
<i>Pulp and Paper</i>	12	1	4	0	1
Metal	20	18	7	6	5
Ceramics	7	5	2	3	2
<i>Machinery and spare part</i>	5	6	2	4	2
Building materials	4	4	2	2	1
Oil and Gas	3	4	1	2	1
Pharmacy	2	4	1	3	1
Electronics	1	3	2	2	1
Electric	5	8	2	3	2
Garment	16	20	4	5	3
Cigars	2	2	1	2	1
Transportation	6	7	3	4	2
Chemical Industry	6	8	3	4	2
Total	181	143	67	74	50

To test the first hypothesis to the tenth hypothesis, and to produce a decent model (fit), then the analysis used in this study are using Partial Least Square (PLS) to the calculation process aided with Smart PLS software application program. The reason for using this model is because there is a tiered structure of relationships between variables, and the software is fulfills the needs of research. At this stage a testing is done toward model suitability through several criterias of *goodness-of-fit*. PLS doesn't assume the existence of certain distribution for parameter estimation, so parametric technique to test significance is not required. Measurement model or *outer model* with reflexive indicator is evaluated using *convergent* and *discriminant validity* from its indicator and *composite reliability* for indicator block. Whereas the outer models with formative indicators are evaluated based on its substantive content is to compare the magnitude of relative weight and to see the significance of the size of the weight (Solimun, [16]). Inner structural models or inner model were evaluated by looking at the percentage of variance explained by looking at R2 (R-square exogenous variables) for the dependent latent constructs uses measurement of Stone-Geisser Q Square test and also for seeing at the magnitude of structural path coefficients. The stability of these estimates were evaluated using t-statistics test which were obtained through bootstrapping procedure.

### Conclusion

This research is expected to result in several studies and guidelines for theoretical practitioners, for researchers and practitioners to be able to know in

practice how the influence of management practices and employee empowerment within the company produces benefits of ERP implementation to integrate with the company's SCM which are:

1. How big committed management affect ERP's benefits on the company's operations is.
2. How big committed management affect ERP's benefit on regularity of the company's business systems is.
3. How big committed management affect ERP's benefit on the company's business strategy is.
4. How big committed management affect the integration process in the implementation of SCM technology companies is.
5. How big committed management affect in the implementation of SCM technology companies is.
6. How big committed management affect business planning in the implementation of SCM technology companies is.
7. How big the effect on benefits of employee empowerment ERP in the company's operations is.
8. How big the impact of employee empowerment in order to benefit ERP business systems at the company is.
9. How big the effect on benefits of employee empowerment ERP in the company's business strategy is.
10. How big the impact of employee empowerment on the integration process in the implementation of SCM technology companies is.
11. How big the impact of employee empowerment on customer relations in the implementation of SCM technology companies is.
12. How big the impact of employee empowerment on business planning in the implementation of SCM technology companies is.
13. How big the Benefit of ERP in the company's operations affect the integration process in the implementation of SCM technology companies is.
14. How big the operational benefits of ERP on corporate influence on customer relations in the implementation of SCM technology companies is.
15. How big the operational benefits of ERP on corporate influence on business planning in the implementation of SCM technology companies is.
16. How big the benefit of ERP systems in order to affect the company's business process integration technology in the implementation of SCM is.
17. How big the benefit of ERP systems on the regularity of the company's business affect customer relationships in SCM technology implementation is.
18. How big the benefit of ERP on the regularity of the company's business systems affect business planning in SCM technology implementation is.
19. How big the benefit of ERP on strategi affect the company's business process integration technology in the implementation of SCM is.

20. How big the benefit of ERP on business stretegi affect the company's customer relationships in SCM technology implementation is.
21. How big the benefit of ERP on business stretegi affect the company's business planning in the implementation of SCM technology is.
22. How big the benefit of ERP in the company's operations affect the company's performance is.
23. How big the benefit of ERP on the regularity of the company's business systems affect the performance of the company is.
24. How big the benefit of ERP on corporate business stretegi effect on firm performance is.
25. How big the company's implementation of SCM integration processes affect the performance of the company is.
26. How big the implementation of SCM enterprise customer relationships affect the performance of the company is.
27. How big the implementation of SCM business planning company that affect the performance of the company is.

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