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## **Can a KIS Overcome Resource Scarcity?**

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## **Abstract**

Resource scarcity for managerial tasks is a major problem in Indonesia although many human resources are available. However, the majority of them does not have a sufficient qualification or adequate skills for performing a management task. This paper aims at describing how a Knowledge-intensive System (KIS) can be used as a tool to help manufacturers to overcome resource scarcity for managers. Our focus is on the Indonesian SME Garment Manufacturers (ISGMs). A prevailing question reads as follows. How does an ISGM employee handle a KIS as a tool to overcome resource scarcity for managers? We note that the KIS will support the ISGM owner in three areas: (1) recording the business transactions according to Indonesia's accounting standards, (2) interpreting financial statements analyses, and (3) interpreting analyses on daily business indicators. To answer the research question, our research method consists of observations, in-depth interviews, and a semi-structured questionnaire. Thirty-one Indonesian garment managers and twenty-four Indonesian financial experts participated in the interviews and filled in the questionnaire. The findings of the study indicate that there exists a resource scarcity for managers. This gap is filled in by ad hoc managers. Using the financial interpretation provided by a KIS, the ad hoc ISGM manager may obtain an actual insight into the business performance. As a result, the ad hoc manager may well deal with the information, and talk at a par with the financial experts and funding agencies. Based on the interviews and the questionnaire, we conjecture that in the long run, the ad hoc managers will be able to learn how to overcome the resource scarcity problem by using the knowledge of the company and the knowledge extracted from a KIS.

**Keywords:** Knowledge-intensive System, Financial Analysis, Resource Scarcity, Indonesia SME Garment Manufacturers

## 1. INTRODUCTION

In our current world, economic problems arise because limited resources face unlimited desires. In general, the limited resources can be divided into three categories: (1) land or natural resources, (2) human resources, and (3) capital (see Parry & Kemp, 2009). To solve an economic problem, a manager has to prioritize the relevant and significant issues in the business. Here the question reads: how can we support a manager in prioritizing the limited resources?

For garment industries, the three categories mentioned above should support *productivity* and *quality* (cf. Bernhard, Thomas, Cesar, & Hanna, 2009). It is expected that the benefits of productivity and quality are much more important than reducing the benefits of the cost. However, the high price competition with a foreign competitor such as China forces the Indonesian SMEs Garment Manufacturer (ISGM) to combat with the competitors, e.g., by using the limited resources in a better way. Obviously, the ISGM business will only be able to sustain when keeping the productivity and the quality high. Therefore, we should find a solution. For instance, identify the weak points of the managers and discover remedies to overcome them.

In Gunawan et al. (2010a), the ISGM manager's managerial weak points are given as two challenges. The first challenge is how to make adequate decisions based on effective monitoring and a sufficient evaluation of the activities. The second challenge is the inability to interpret financial statements and management reports appropriately. We believe that these two challenges hamper the development of the Indonesian economy. The weaknesses of ISGMs can be summarized by four features, namely (1) a lack of capital, (2) a lack of skills, (3) problems in productivity and business development, and (4) a lack of communication and knowledge sharing among the managers (Indarti, 2006; Cheng, Lu, & Sheu, 2009; Soetrisno, 2009).

To obtain more capital from external parties such as banks, the ISGMs have to prove that they have (A) a sound financial position, (B) a good business prospect, and (C) strong and solid capabilities to sustain. To prove the three conditions, the ISGMs should focus on how to increase the capabilities of their human resources. For the purpose of clarity, we transform the set of four weaknesses into two categories: the first category contains capital (weakness 1) and the second category deals with human

resources (weaknesses 2, 3, and 4). The second category is facing the resource scarcity problem. By enhancing the management's knowledge and capabilities we may overcome the resource scarcity (cf. Rice, 2000; Miles, Miles, Snow, Blomqvist, & Rocha, 2009; Gunawan, et al., 2010a). In practice, this has a top priority. In our opinion, it can be done by a Knowledge-intensive System (KIS).

The use of a KIS is based on previous successes of a KIS implementation into the financial domain. KIS has been applied to solve decision problems in a variety of domains, such as supporting investments decisions (see Poh, 2000), performance measurement (Ammar, Duncombe, Jump, & Wright, 2004; Khan & Wibisono, 2008; Wang, Huang, & Lai, 2008), formulating budget planning (Wen, Wang, & Wang, 2005), formulating the auditor's opinion (Wahdan, 2006), optimizing portfolio management (Bao & Yang, 2008), determining cost-volume-profit analysis (Yuan, 2009), determining (pro-)performance appraisal (Chen & Chen, 2010), and obtaining customer-buying patterns (Jayanthi & Vishal, 2011).

As a sequel to the successes mentioned above, we constructed a KIS system named LIA (Leading to Information Access). LIA has the capability to (1) record ISGMs business transactions according to Indonesia's accounting standards, (2) convert the accounting data according to various financial statements analysis methods, (3) provide an automatic evaluation of the daily business activities, and (4) provide an expert's interpretation for the results obtained in points 2 and 3.

In our research, we are interested in answering the following a research question (RQ). How does an ad hoc ISGM manager handle LIA as a tool to overcome resource scarcity? We note that the underlying idea is that the ad hoc manager learns from the tool and becomes a competent manager. The outline of the remainder of this paper is as follows. In section 2, we review related literature. Section 3 describes our research methodology. Section 4 attempts to answer the RQ about how the ISGM manager uses LIA as a tool to overcome resource scarcity. Finally, section 5 provides our conclusions and points at future research.

## 2. LITERATURE REVIEW

A KIS is primarily developed to help users in their decision-making activities. But as an unintentional consequence, the KIS may stimulate the users to learn more about a problem (Antony & Santhanam, 2007). This learning process even takes place implicitly. With KIS, the ISGM manager can learn how to overcome resource scarcity by monitoring and assessing the financial and production indicators (Gunawan et al., 2010a). Finally, KIS may act as a change agent to improve the user's knowledge (Wahdan, 2006).

When people develop a KIS, it commonly involves three activities, namely designing the knowledge engine, building the program, and implementing the program in a company. In the first activity, there are five stages in the KIS development, namely (1) knowledge acquisition, (2) knowledge analysis and representation, (3) knowledge validation, (4) inference design, and (5) explanation and justification.

For building a richer understanding in how to make adequate decisions, the combination of learning theories in a KIS development is crucial (cf. Wu, Hsiao, Wu, Lin, & Huang, 2011). The theories suggest combining the types and principles of behaviourism and cognitive science. Behaviourists consider learning to be produced by stimulation and reinforcement, while cognitiviste scoemtosts consider learning not to be only stimulation and reinforcement, but also to involve thinking (Wu et al., 2011). However, many learning-through-KIS initiatives failed to achieve the desired learning outcomes. The reasons for failure are mainly owing to (1) no support for the use of a KIS, and (2) inappropriate technology selection (see Ahmed, 2010).

To overcome the first reason of failure, an effort to obtain commitment in using the KIS is essential. Commitment can be achieved when there is a high acceptance and intention to use a KIS. For ISGMs managers, it is more acceptable to be supported by reliable intelligent software than to be guided by professional experts (cf. Gunawan, Wahdan, van den Herik, & Kornarius, 2011). Most of the ISGMs are not willing to put their budget in obtaining a learning process from professional experts. Because funding is a limitation, our intention to use a KIS should be seen as an effort to educate the ISGM managers.

To overcome the second reason of failure, we recommend an effort to combine four KIS development techniques (see Xidonas, Mavrotas, & Psarras, 2009). Depending on the complexity of the issue, the interpretation of a result by the KIS is not always easy and can lead to different conclusions. To overcome the occurrence of different conclusions, researchers developed various methods, such as (1) model-driven methods, (2) data-mining, (3) case-based reasoning (CBR), and (4) fuzzy methods. All these four methods are developed to create a higher precision when mimicking the line of reasoning in an expert's thinking.

Facer and Sandford (2010) argue that a new approach of the education system is needed in the next 25 years. They discuss that decision-making capabilities can be improved by using computer-supported learning systems (in this paper, we define it as learning through LIA). The use of information and communication technologies for creating learning experiences will foster and support the process of understanding on how to make adequate decisions (Ahmed, 2010).

### **3. RESEARCH METHODOLOGY**

For constructing LIA, our research methodology consists of three stages, viz. literature review, fieldwork (observations, in-depth interviews, and a semi-structured questionnaire), and analysis of the results. Literature review is a basic ingredient of this research (see section2).

For the fieldwork, we combine three methods from the five methods described by Wagner et al. (2002). The three methods are (1) unstructured interviewing techniques, (2) structured interviewing techniques, and (3) protocol analysis. The acquired knowledge was validated by letting the experienced-financial experts review the results of the knowledge acquisition process. Identification of the problem categorization will be performed by means of (1) interview with experienced financial experts, (2) identified financial events, and (3) financial and accounting methods from the literature review. Then, a protocol analysis will be executed to discover the processes of problem solving by experienced financial experts when evaluating a

company's performance. Next, problem behaviour graphs (PBG) will be used to figure out the financial experts' solving strategy (Shiue et al., 2008).

Thirty-one garment managers (or owners) from different companies were interviewed in our sample. The goal was (1) to obtain their knowledge in managing the ISGMs and (2) to obtain information on the ISGM's financial statements. As most of them were interested to use the software for free later on (which was promised), they were willing to participate in the research.

In order to obtain the knowledge of the financial experts regarding the financial issue in the ISGM, we constructed a new case study, derived from the input given by five ISGMs. The case presented to them comes from real historical data from an ISGM. To keep the ISGM anonymous, we called it INBUS2, meaning Indonesia Business 2 [INBUS1 has been used in a previous article, and is a different company]. INBUS2 is a family-owned company operating in Bandung, Indonesia. INBUS2 was established in 1976. INBUS2 has an experience to produce and distribute its products to 22 provinces in Indonesia and to 14 countries, namely Bahrain, Chile, Dubai, Durban, Japan, Jeddah, Jordan, Kuwait, Panama, Poland, Riyadh, Russia, Singapore, and Turkey.

Owing to the limited number of ISGM owners who were willing to provide their financial statements, we attempted to obtain the general ISGM's financial conditions by using the archival research conducted annually by the BPS-Statistics Indonesia. From the 23,430 manufacturers (on average from 2001 till 2008), which participate(d) in the annual manufacturing survey, a sample of 2,504 garment manufacturers (on average) is used for the purpose of our study. Using the data from this survey, we calculated some financial ratios and used them as industry average (as a source of comparison among companies with the industry).

Using the financial data in the new case study, in-depth interviews were conducted to obtain knowledge from the financial experts. Twenty-five financial experts participated in our survey.

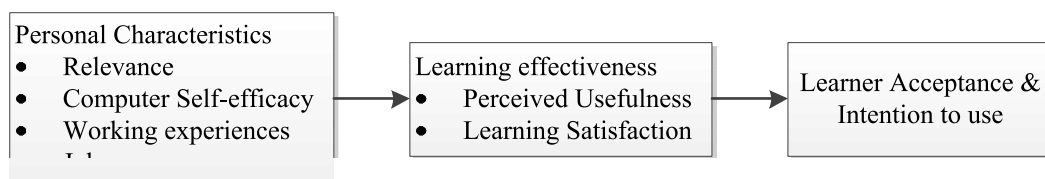


#### 4. LEARNING WITH LIA

To ensure the success of a KIS implementation, the combination of (a) an appropriate choice of technology means and (b) the full support for the use of a KIS is needed (Ahmed, 2010). In order to obtain high support for the use of LIA, ISGM managers have to be given strong evidence for benefits directly related to LIA. So, the managers may accept the concept of LIA and may have an intention to use LIA. A common acceptance and intention to use LIA can be achieved when the managers observe a high learning effectiveness by LIA (see Figure. 1).

The learning effectiveness consists of two components: (1) perceived usefulness, and (2) learning satisfaction. Perceived usefulness evaluates the managers' opinion on the interpretation results by LIA for a specific case, while learning satisfaction evaluates the opinion on the LIA performance. We observe that personal characteristics have a correlation with the manager's opinion on learning effectiveness. The personal characteristics consist of four components, namely (1) LIA's relevance with the manager's main jobs, (2) the level of the manager's computer self-efficacy (refers to the manager's judgements of their capabilities to use a computer for their daily jobs), (3) the manager's working experiences, and (4) the main (defined) jobs of the managers.

**Figure 1. Research Framework**



Combined source: adapted from Chou (2005), Chou and Liu (2005), Davis and Wong (2007), and Ahmed (2010)

There are two challenging issues in developing LIA for ISGMs. The first challenge arises as most of the ISGMs do not follow accounting standards in producing their accounting reports. The main cause of this behaviour is because most of them, in particular, the

manager from the older generation, do not have the knowledge in adequately recording business activities under an accounting standard. Therefore, the ISGMs must be supported by an automatic system that can ensure that it follows easily the accounting standards. Without following the accounting standards, the amounts resulting from the financial techniques will be useless.

The second challenge is caused by the complexity of the interpretation of the financial statements analysis. When a professional financial expert observes the result of a financial technique, he<sup>1</sup> can formulate an adequate conclusion. However, this conclusion may change when he observes the result from another financial technique. In order to have a full picture of the company's financial performance and condition, a financial expert needs to have an abundance of figures from various financial techniques. This issue makes the interpretation of financial statements analysis a challenging issue for a novice manager or a non-financial manager. Admittedly, the ad hoc ISGM managers understand how to measure the company's performances with respect to income statements. But most of them do not understand (1) how to transform the numbers into other financial indicators and (2) how to interpret the numbers for supporting their decision (Gunawan, Wahdan, & van den Herik, 2010b).

Consequently, the ad hoc IGMS managers decide and negotiate without sufficient information, representing their company experiences. The ISGM managers should be supported to be able to utilize production indicators and financial indicators for (1) evaluating recent activities, (2) monitoring on-going activities, and (3) deciding which strategies should be taken to sustain in the garment industry. LIA provides professional expert knowledge (both from financial experts and from professional garment practitioners) on using various analysis methods and on interpreting the results of the methods.

In order to deal with the first challenge, we use several modules that can record daily transactions into a structured format of Indonesian accounting standards (SAK-ETAP). Supported by an automatic Accounting Information System (AIS), the manager will have an advantage owing to the automatic accounting recording feature. The financial statements resulting from the AIS will automatically follow SAK-ETAP. Thus, these

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<sup>1</sup> Henceforth, for brevity we use 'he' and 'his' whenever 'he or she' and 'his or her' are meant.

financial statements can be analysed using the DuPont model (Libby, Libby, & Short, 2009) and the other financial statements analysis methods (Gitman, 2009; Shue, Chen, & Shiue, 2009). SAK-ETAP complies with the International Financial Reporting Standards (IFRS) for SMEs.

In order to deal with the second challenge, we provide expert knowledge on how to interpret the results of five financial methods and sixteen production indicators. The first method used in LIA is (1) the DuPont model (see Gunawan, Wahdan, van den Herik, Athuri, & Tan Lian Soei, 2011). The DuPont model provides an overview on the business' operating, investing, and financing strategies that affect the profitability of a business (Libby et al., 2009). The four other methods of financial statements analysis are used for obtaining a comprehensive overview of (2) cash flow analysis, (3) financial ratio analysis, (4) common size analysis, and (5) timeline analysis. These financial indicators are used to support the ISGM managers in monitoring and evaluating the company's financial conditions, in particular when dealing with external parties such as banks, suppliers, and customers.

The managers in our sample strongly agreed on the usefulness of LIA. The agreement started as a disagreement since a majority of the managers believed that INBUS2 was a healthy company, whereas LIA stated that INBUS2 was not a healthy company. After comparing the results of their analysis on INBUS2 with the results by LIA, the managers (with a different opinion) arrive at the conclusion that LIA's opinion on INBUS2 being not healthy company was true. For its line of reasoning and its conclusion, LIA provided six comprehensive indicators (I) that illustrated the real conditions of INBUS2 (see below).

The procedure was as follows. Having inspected the financial indicators of INBUS2 by themselves, most of the managers concluded that INBUS2 had a good performance and should be categorized as a healthy garment business. In a recent six months period, INBUS2 had a profit margin ranging from 22% till 63%. The managers were confident with the health of the company as they observed that the average of the cash between those six months was always huge (IDR 4,763,981,282 - Indonesian Dollar). Based on their opinion, the most important values to be observed were the sales and the availability of money.

Only small parts of the managers categorized INBUS2 as a risky company as they also compared the amount of sales with the amount of accounts receivable. The managers observed that the accounts receivable were 33% above the net sales (Indicator I-1). Based on their experience, when an ISGM has more debts than the amount of net sales, the ISGM will face difficulties in its cash flow. Indeed, the LIA interpretation on INBUS2 showed that even if LIA assumed all current sales were conducted in debt, there was also IDR 863,542,844 (33%) uncollectable debt to be received in the previous month. When a company faces such a huge amount of debt, the manager has to allocate more cash for the expenditure on daily operation, since the company has to pay in cash for the expenditure on daily operation (such as wages, raw materials, and expenses), while the payment from customers would be delayed. In the practice, the managers have to raise cash on hand either by taking out their saving/investment or by obtaining funds from other parties. Both two cash-raising methods will cause a drawback for INBUS2 because of the interest.

Thereafter, LIA also provided the finding that the number of Return on Asset (ROA) was less than the interest rate of the Indonesia bank. ROA measures the overall effectiveness of the management in generating profits from its available assets (Gitman, 2009). LIA showed that the value of assets of INBUS2 was too high. When LIA analysed the structure of the assets, LIA pinpointed that 42.65% of the assets was cash stored in the bank (for saving and for investment), 32.96% of the assets were inventories, and 23.13% of the assets was accounts receivable, while the total fixed assets only account to 1.26%. So, INBUS2 had too many current assets (Indicator I-2). The value of the fixed assets in the balance sheet was huge (IDR 2,792,436,772), but almost all of the fixed assets were old (they already transformed to cash because of accumulation depreciation concepts). The value of accumulation depreciation of fixed assets was 55.69% of the cash stored in the bank. This finding gave an adequate insight into the fact that the operating and investing performances of INBUS2 in the past were good.

However, it seemed that INBUS2 was still able to survive because of the huge amount of its investing activities (Indicator I-3). This was confirmed from the result by the cash flow analysis. Although a negative status on cash provided by operating activities

occurred several times, the results of the amount of investing also decreased because of the managers need to cash in hands for INBUS2's operational expenditures. All in all, the situation is not clear after analysing three indicators.

The three remaining comprehensive indicators are derived from the set of 16 Key Performance Indicators (KPIs) in combination with the financial statements that led to I-1, I-2, and I-3. The sixteen KPIs are given in Table 1. They come from research by Gunawan, Wahdan, van den Herik, and Kornarius (2011).

**Table 1. The KPIs in LIA**

Entities to be evaluated	F means functions to be monitored S means standard value to evaluate A means aims of the KPIs
Supplier	F: KPI 1: <i>Rate of material defect caused by the material itself</i> S: Quality of raw material purchased A: Productivity, Quality, and Cost Control  F: KPI 2: <i>Average production costs caused by delayed shipments</i> S: Performance of supplier (accuracy on delivering raw material) A: Productivity and Cost Control
Cutting department	F: KPI 3: <i>Rate of waste caused by cutting processes</i> S: Performance on the efficient use of the fabric A: Productivity, Quality, and Cost Control  F: KPI 4: <i>Rate of damaged fabric by cutting processes</i> S: Performance on the effective cutting processes A: Productivity, Quality, and Cost Control  F: KPI 5: <i>Rate of the material use per group product</i> S: Material standard for producing similar products A: Cost Control
Sewing (production) department	F: KPI 6: <i>Rate of damaged products by employees errors</i> S: Performance on the effective sewing processes A: Productivity, Quality, and Cost Control  F: KPI 7: <i>Rate of damaged equipment by human errors</i> S: Performance on the effective use of sewing machine and its supplies A: Cost Control

	<p>F: KPI 8: <i>Rate of employee productivity per hour</i>  S: Performance on the productivity of each employee  A: Productivity and Cost Control</p> <p>F: KPI 9: <i>Average time to produce per group product.</i>  S: Time standard for sewing similar products  A: Productivity and Cost Control</p>
Partners (outsourcing)	<p>F: KPI 10: <i>Rate of damaged products by partner</i>  S: Performance on the partner's effective level  A: Productivity, Quality, and Cost Control</p> <p>F: KPI 11: <i>Average time of partner to produce per group product</i>  S: Time standard for partner to produce similar products  A: Productivity and Cost Control</p>
Customers	<p>F: KPI 12: <i>Rate of sales return per customer</i>  S: Sales return level of each customer  A: Cost Control</p> <p>F: KPI 13: <i>Rate of credit per customer</i>  S: Account receivable level (credit position) of each customer  A: Cost Control</p>
Internal management	<p>F: KPI 14: <i>Rate of production costs per group product</i>  S: Standard cost for producing similar products  A: Cost Control</p> <p>F: KPI 15: <i>Rate of repeated production per group product</i>  S: Performance on repeated production of similar products  A: Productivity, Quality, and Cost Control</p> <p>F: KPI 16: <i>Rate of raw material inventories</i>  S: Quota standard for each raw material inventories  A: Cost Control</p>

Source: Gunawan, Wahdan, van den Herik, and Kornarius (2011).

LIA clearly indicated that INBUS2 failed to manage its inventory adequately. The material used in October 2007 was worth IDR 556,920,000 while the value of the inventory was IDR 3,757,520,000. This means that INBUS2 had valued its inventory too high (Indicator I-4). There were three uncommon values observed by LIA: the value of KPI 16 (rate of raw material inventory), a high number on KPI 12 (rate of sales return

per customer), and KPI 6 (rate of damaged products by employees errors). The high value of the inventory was mainly because of the following three reasons. First, INBUS2 bought an abundance of raw materials for a next order. Second, there were a huge number of sales returns (42.78% of the sales). Third, there was a high value noted for damaged products resulting from employees' errors.

High sales returns may be caused by two cases. The first case is because the inability of the ISGM to fulfil the products specification as stipulated by the customer. The second case is because some bad customers return intentionally the product. Naturally, the defect happens unintentionally. However, in some cases, the defects of the products are made intentionally by the customer. LIA showed that a customer who returned the ordered good regularly has a behaviour to return the ordered goods frequently in the payment period, so that the manager must assess the credit granted to a customer accurately and must weigh the pros and cons (Indicator I-5). INBUS2 lost a huge amount of profits because of the customer behaviour. The customer in question was a well-known department store in Bandung, and the manager of the department store attempted to minimize the risk as a result of their failure in selling the products. They ordered a huge amount of garment from INBUS2, but in some of the cases, the department store returned the products. The INBUS2 manager suspected that in order to be able to return the product, the department store intentionally made quite some damage on the products. Bad customers is one of the major contributors to ISGM's losses (Winarto & Gunawan, 2008).

The high value in the rate of damaged products by errors of employees triggered the managers to focus on the investigation of why the quality and control officers did not observe the defects (Indicator I-6). If the quality and control officers observed the defect, the employee will have to repair the damage without being paid. A surprising fact came to light when the result by LIA was confirmed by the INBUS2 manager. What we suspected was that there was collusion between some of the employees. For instance, INBUS2 sold the damaged garment for a lower price to the employees as their effort to make a good relationship with the employees. However, the INBUS2 manager observed that the damaged products were sold by a domestic store. How

could the store display and sell the damaged products in such a huge volume? We refrain from answering this question, but surely something was wrong.

After LIA has highlighted the six comprehensive indicators (I-1 till I-6), the ISGM managers agree that there is a high need to learn (1) on how to analyze the financial indicators, and (2) on how to observe a production indicator comprehensively. To minimize the misuse of the limited resources, the managers understood that only monitoring the sales and the availability of cash was not sufficient. They also understood now why the bank can determine that their business was not healthy. They agreed to learn from LIA, although they were still doubting their ability to use the system as most of them were not familiar with using a computer for learning purpose. Whatever the cases, the owners now prefer to use LIA above hiring a professional expert. The owner's reasoning frequently is as follows: *"when dealing with a financial issue, for me, it is more acceptable to be supported by an intelligent software program than to have a newcomer as the manager"* (Gunawan, Wahdan, van den Herik, & Athuri, 2011).

## **5. CONCLUSIONS**

The most significant way to overcome resource scarcity is by enhancing human capabilities, e.g., by making ad hoc managers full-blown (almost experienced) managers. The advantage is that higher competence in managerial capabilities leads to higher success in accomplishing (1) high productivity, (2) high quality, and (3) low total costs. Moreover, higher competence leads to higher trust from external funding organizations such as the banks. The ad hoc ISGM managers will obtain a huge benefit when they are able to master the insights of LIA into the results of the company.

Based on the analysis above, we may answer the RQ as follows. By using LIA, the managers should easily learn how to enhance their management capabilities. This is in line with the research findings by Cebi, Aydin, and Gozlu (2010). They concluded that an enterprise can obtain several benefits from knowledge-intensive applications which will lead the enterprise to a better performance. In particular, knowledge activities may provide the most significant contribution to the enterprise performance. So, a KIS will



support ad hoc ISGM managers in identifying and overcoming challenges, in particular to overcome resource scarcity.

In addition to our conclusion on resource scarcity, we aim at formulating relevant conclusions on handling LIA. When using LIA properly, the ISGM managers are supported by trustful information on their company's performance. In their interaction with LIA, the managers may obtain a professional guidance in such a way that it looks like the advice comes from a human financial expert. LIA guides the managers to learn how to make better decisions in the garment industry. This learning process may increase the ISGM managers' capabilities.

LIA supports the managers in (1) recording their business transactions according to the Indonesia's accounting standards, (2) converting the accounting data according to various financial statement analysis methods, and (3) monitoring, evaluating, and decision making processes. LIA also analyses sixteen KPIs which are used to giving an in-depth insight into the activities of the company (see Gunawan, Wahdan, van den Herik, & Kornarius, 2011). Using the financial data from the AIS, a standard value for each KPI can be formulated. This standard value will be used when the manager wants to set a performance standard that must be achieved by the employees.

Moreover, LIA will not only support the manager in managing internal issues of the ISGM, but also in dealing with external financial parties such as banks. LIA helps the company in recording the daily financial transactions according to SAK-ETAP. Using various financial methods stored, LIA converts those accounting data into valuable financial information. Then, the knowledge stored in the KIS will give some interpretations on the result of those financial methods. The interpretations will support the manager to identify the possible causes of the changes in the financial statements. The KIS provides interpretation for the result of each financial statements analysis. Based on continuous use of LIA, the manager will be able to learn how professional financial experts analyse and evaluate the financial performance of the ISGMs.

The findings of the study indicate that most of the respondents accept the concept of LIA and have an intention to use LIA (after we have made it available to them). The investigation of the case INBUS2 by LIA, gave the managers a positive attitude towards

LIA. They understood the importance of (1) learning how to monitor on-going garment activities, (2) of evaluating recent financial activities, and (3) dealing with resource scarcity. They now believe that the experts' knowledge stored in LIA and the knowledge generated from their company's financial indicators and production indicators will support them in their efforts to manage the limited resources well.

The positive opinion of the respondents on LIA is based on six indicators (or evidences) provided by LIA that help the managers in analysing the performance of INBUS2. These six indicators helped the managers to arrive at the conclusion that INBUS2 has a high risk because of (1) its high amount of accounts receivable; (2) its domination on the current assets, (3) its high dependency on investing activities, (4) its high level of inventory on hand. The real cause of the high inventory level is explained by (5) the bad behaviour of its customers and (6) the bad behaviour of its employees.

Finally, we remark that the limitation of our study is twofold. First, we were still constructing the LIA when this research was conducted. Therefore, the managers were not able to interact with LIA. In the future, we will test the LIA as an artificial intelligence system. So, the respondents can also give their satisfaction level when using LIA (in a computer-based form). Second, the size of our sample in this study is small. We should increase the number of the respondents to validate the results of LIA and the effective use of LIA as a learning tool.

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