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EFFECT OF KNOWLEDGE CREATION ON INTELLECTUAL CAPITAL: A STUDY IN BANK RAKYAT INDONESIA OF MUNTILAN, CENTRAL JAVA, INDONESIA

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Abstract

This research is aimed to examine (1) effect of knowledge creation on human capital (2) effect of human capital on structural capital (3) effect of human capital on customer capital (4) effect of structural capital on customer capital in Bank Rakyat Indonesia branch Muntilan, Central Java, Indonesia. Research sample are 65 employees of Bank Rakyat Indonesia branch Muntilan. Analysis method uses structural equation modeling. Based on data analysis, this research concludes that (1) knowledge creation affects human capital, (2) human capital affects structural capital, (3) human capital affects customer capital, (4) structural capital affects customer capital; in Bank Rakyat Indonesia branch Muntilan, Central Java, Indonesia.

Keywords: Creation, Human Capital, Structural Capital, Customer Capital

INTRODUCTION

Nowadays, banking services are provided easier and faster because it supported by web-service technology. The technology develops global competition to make business run efficiently in terms of time, distance, and place. Banking industry uses the technology to perform transaction online. It not just helps customers, but also banks itself to give services in anytime and anywhere.

Technology is a result of companies' knowledge and capability to create new knowledge continuously. If technology is one of business success keys, then it is important to understand the innovation of knowledge creation (Sukmawati et al., 2008). Nonaka and Takeuchi (1995) explain innovation as accumulation of external knowledge which shared widely in to internal of companies, stored as companies' knowledge base, and implemented in new technology, product, and methods development. One of knowledge creation indicators is innovation.

In Japan, main factor that gives effect on companies' success is knowledge creation (Nonaka and Takeuchi, 1995). The creation pictures companies' ability to convert tacit knowledge into explicit one, and used in companies' businesses process, such as socialization, externalization, combination, and internalization (or known well as SECI model).

Groff and Jones (2003) explain tacit knowledge as intangible individual knowledge that inherent in experiences. In addition, Malhotra (2005) states that tacit knowledge provides intangible solutions in mind. Tacit knowledge includes knowledge of knowing, generating, sharing, and managing. Tacit knowledge is personal knowledge and difficult to be codified, articulated, and documented. In the other hand, explicit knowledge is knowledge that has been converted in to printed, text, analog, or digital document (Yusup, 2012), and ready to be accessed as formal and organized knowledge (Nonaka and Takeuchi 1999).

Development of knowledge and technology leads to high competition. Companies have to change the ways of doing businesses from labor based into knowledge based (Solikhah et al.

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2010). It can be seen by their assets. Nowadays, intangible assets are more important than tangible one.

Intellectual business model can be seen by human resource, customer, and structural capitals (Teece, 2000). Marr and Schiuma (2001) state that knowledge management is important base to achieves, improves, and holds intellectual capital. Knowledge management itself defined as process of creating, achieving, understanding, and using knowledge, in order to increases organization's learning and performance, includes in identification, creation, acquisition, transfer, sharing, and exploration of knowledge (Chyntia et al, 2005).

Knowledge business era pushes banking sector to put knowledge management down as main aspect of competitive advantage. It also can provide customer satisfaction. In modern banking industry, bank does not provide saving, investing, and leasing services only; but also provide updated information and knowledge for customers. Only bank with updated knowledge can increases competitive advantage (Tania, 2015). Shih et al (2010) find knowledge creation has positive effect on structural capital, and human capital has positive effect on structural capital and customer capital. Ning et al (2011) also find knowledge creation increases all intellectual capital components. Cabrita and Vaz (2006) find intellectual capital has significant effect on banking industry performance in Portugal.

Bank Rakyat Indonesia (BRI) founded in Purwokerto, Central Java by Raden Bai Aria Wirjaatmadja named as *De Poerkertosche Hulp en Spaarbank der Inlandsche Hoofden* 16 December 1895. BRI becomes limited corporate in 1 August 1992, with all shares owned by Indonesian government. In 2003, BRI becomes public company and 30% of shares owned by public.

BRI is one of pioneers in Indonesia that launches its own satellite to improve digital banking transaction. BRI also has working units in almost whole Indonesia areas to support digital banking transaction.

Success of BRI transformation comes from some important innovations. First, innovation that gives full autonomy on unit offices for operational activities. Second, innovation of recruitment for local people because they know well about customers' environment and background, further, it decrease credit risk. Third, innovation of customer services, where good and repeat customers will past simple and easier procedures. Based on above explanation, this research is aimed to examine (1) effect of knowledge creation on human capital (2) effect of human capital on structural capital (3) effect of human capital on customer capital (4) effect of structural capital on customer capital in BRI branch of Muntilan, Central Java, Indonesia.

LITERATURE REVIEW

Knowledge Management

Knowledge is important strategic factor in operational activities because it is related to companies' ability to achieve competitive advantages. It is important to finds ways to manage the knowledge.

Maria (2003) states that there are two kind of knowledge, which are tacit and explicit. Sampurno (2007) explains that tacit knowledge is personal because it is hard to be formulated, to be

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communicated, and to be shared to others. Tacit knowledge has technical dimension called "know how". Explicit knowledge can be conceptualized and stored in information system.

Explicit knowledge refers to knowledge that can be articulated and documented in to various "storage", such as books, articles, journals, mathematical/physical/chemical formula, reports, computer hard disk, archives, etc. Explicit knowledge is ready to be transformed by innovation process of materials, product structure, packages, forms and functions, etc. Innovation process includes innovations of technology, chemical process, machinery process, manufacture system and network, material processing method and technique, etc. Management innovation includes innovations of marketing, advertising, quality control, product design, production schedule, facilities maintenance, distribution, etc.

Tacit knowledge is knowledge that has not been articulated yet still in inside of individual. It is planted in its physical owner's expertise and capability and can be seen when it is used. Other parts of tacit knowledge are intuitions that built by experiences and internalized explicit knowledge. It is less systematic than explicit ones.

Steps of implementation of knowledge management are collecting, analyzing, planning, institutionalization, and evaluation (Bornemann et al, 2003). Evaluation is back again to steps of collecting and analyzing. It will be repeated to that knowledge management can keep developed. Implementation of knowledge is important in innovation creation, further, it will be improves organizational performance.

Knowledge Creation

Sampurno (2007) explains that knowledge creation is important to create sustainable value and "know-how". The essence of knowledge creation is interaction between tacit and explicit knowledge. Dynamic interaction leads to innovation, further, it becomes organizational knowledge.

Knowledge creation is one of knowledge management implementation. It can be achieved by learning, research and development, and accumulated experience. Internal knowledge can be achieved by communication with suppliers, customers, and competitors.

Based on Socialization, Externalization, Combination, Internalization (SECI) model, new knowledge can be achieved by:

1. Socialization, which is converting a tacit knowledge into another tacit knowledge.
2. Externalization, which is converting tacit knowledge into explicit knowledge.
3. Combination, which is using an existing explicit knowledge to be implemented into another explicit knowledge.
4. Internalization, which is converting explicit knowledge into tacit knowledge.

Intellectual Capital

Intellectual capital is hidden value of business (Ulum, 2016). Terminology of "hidden" refers to assets with no physical appearance and assets that do not reported in financial statement. Intellectual capital is defined as set of things that used by companies to compete in the market,

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includes in intellectual material (knowledge, information, experience) and intellectual property (wealth value). It is combination of intangible assets, intellectual, employee, and infrastructure. Generally, intellectual capital can be divided in to human capital (genetic inheritance, education, experience, and attitude), structural capital (database, organizational charts, manual process, strategy, routines), and customer capital (marketing channels and customer relationship) (Bontis et al., 2000).

Hypotheses Development

Sampurno (2007) explains that human capital is the key of competitiveness and innovation in new economics. It contributes to individual capabilities, knowledge, skills, and competition and experiences. Basically, human capital has central role to run structural capital in order to achieve organizational goal.

Knowledge comes from skills and capability exchange and learning which implemented in the works. Employees can be knowledgeable by learning existing knowledge or observing new knowledge, further, it will be human capital for companies (Ning et al, 2011). Ning et al. (2011) suggest knowledge management as important concept to achieves, develops, and maintains organizational intellectual capital. It means that effective development of knowledge management can increases accumulated intellectual capital.

Shih et al (2010) explain that activities in knowledge management help human capital to increase operational performance. Sampurno (2007) suggests that knowledge creation improves development of tacit and explicit knowledge, further, it will create sustainable value by enhance knowledge creation and usage. Main point of knowledge creation is interaction between tacit and explicit knowledge to become innovation and organizational knowledge.

Intellectual capital can be achieved by systematic human resource investment. Employee education and training investment as well as improvement of human resource development generate higher productivity, more creative assets, and higher performance. Ning et al (2011) find knowledge creation and human capital have significant correlation. Shih et al (2010) also find that knowledge creation gives positive effect on human capital.

H1: There is significant effect of knowledge creation on human capital

Basically, structural capital is whole organizational system includes formal (procedure, operation system, internal rules) and informal system (organizational culture). In the context of a constantly changing environment, structural capital needs dynamic regeneration and reinforcement so that whole components of intangible assets can be converted by structural capital into intellectual capital that generate higher value (Sampurno, 2007).

Companies need absorptive capacity in order to be able to learn from external resources. Constantly collective learning improves core competences and knowledge capability in organizational level. Technology and innovation implementation cannot be done well if learning and absorptive capacity is lower. Beside human capital, companies also need structural capital; include operation system, culture, and information technology; to support human capital so that higher and sustainable value can be achieved. Structural capital has important role for

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performance improvement. Weaker structural capital reduces performance because companies are not be able to convert intangible assets into intellectual capital which important to higher value creation (Sampourno, 2007).

By using higher quality and intellectual, employees can change working practice and find innovative solution of certain problem, further, it will improve structural capital, such as organizational routine, procedures, system, culture, database, etc. This explanation is linear with Ning (2011) that find significant relationship between human capital and structural capital.

H2: There is significant effect of human capital on structural capital

Since customer satisfaction one of key factors to maintain customer existence, companies will measure it constantly and wisely. Satisfied customers are more likely to be loyal in long term, buying and introducing companies' product, talking good things about companies and their product to others (Kotler dan Keller, 2008).

In another dimension, human capital also has important role for customer capital. Sampurno (2007) explains that employees as human capital need good working condition, further, it lead to employees' loyalty. Higher employees' loyalty related to higher product quality. Higher product quality leads to higher customer satisfaction. Ning et al (2011) find similar result that human capital improves customer capital.

H3: There is significant effect of human capital on customer capital

Sampurno (2007) suggest that customer capital is a value which generated from interaction between companies and customers. Well customer interaction leads to sustainable "cash flow" in the future as well as determinant factor of companies' business survival. Strong components of customer capital affect structural capital directly, especially in area of operation system, information technology, and organizational culture that able to response customer needs, include in improvement of customer loyalty and satisfaction (Sampurno, 2007).

Ning et al (2011) and Bontis et al (2000) find that there is significant relationship between structural capital and customer capital, while Shih et al (2010) and Astuti dan Sabeni (2005) find there is no evidence that structural capital has significant relationship with customer capital.

H4: There is significant effect of structural capital on customer capital

Based on hypothesis development and previous studies, research framework is as followed.

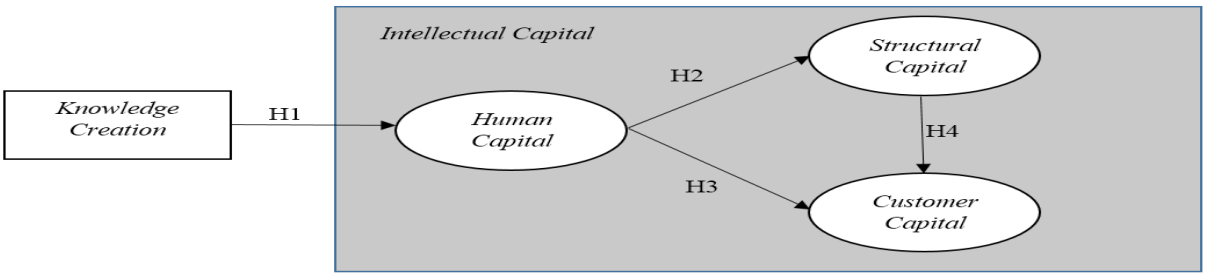

Figure1. Research Framework

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RESEARCH METHOD

Research Design

This research is performed in Bank Rakyat Indonesia branch Muntilan. The location is at Pemuda Street No.06, Pucungrejo, Muntilan, Magelang, Central Java, Indonesia. Population are 180 employees of Bank Rakyat Indonesia branch Muntilan. Research sample are determined by Solvin formula as followed.

$$n = \frac{N}{1 + Ne^2}$$

Where n is research sample, N is population (180), e is margin of error (10%). Based on it, number of sample are 65 employees.

Variables

Research variable are knowledge creation, human capital, structural capital, and customer capital. All research variable are measured with questionnaires of 5 likert scale (from strongly disagree to strongly agree). Indicators of knowledge creation based on SECI model, which are socialization, externalization, combination, and internalization. Indicators of human capital are tacit knowledge, explicit knowledge, training program, and recruitment. Indicators of structural capital are technology and information system, companies' image, organizational and documentation concept, and patents. Indicators of customer capital are long-term contract, customer satisfaction, customer profile, contract reform.

Analysist Method

This research performs structural equation modeling test as hypotheses test. Structural equation modeling test combines factor analysis and path analysis in order to examine and estimate multiple exogenous and exogenous variables simultaneously with multiple indicators.

RESULT

Demographic Characteristics

Table1. Demographic Characteristics

Characteristics		Number of Respondent	Percentage
Gender	Male	31	47.7 %
	Female	34	52.3 %
	Total	65	100.0 %
Age	below 25 years old	11	16.9 %
	25 - 35 years old	33	50.8 %
	36 - 45 years old	18	27.7 %
	46 - 55 years old	3	4.6 %
	Total	65	100.0 %
Education	High School	6	9.2 %
	Diploma	8	12.3 %
	Bachelor	51	78.5 %
	Total	65	100.0 %

Have been work for	1 - 5 years	39	60.0 %
	6 - 10 years	6	9.2 %
	11 - 15 years	14	21.5 %
	above 15 years	6	9.2 %
	Total	65	100.0 %

Source: proceed primary data (2019)

Based on table 1, respondents are dominated by female respondents with 52.3%, 25-35 years old with 50.8%, having bachelor degree with 78.5%, have been work for 1-5 years with 60.0% of all 65 respondents.

Validity and Reliability Tests

Table2. Initial Validity Test

Item	Customer	Human	Knowledge	Structural
Socialization	0.496	0.160	**0.554**	0.384
Externalization	0.349	0.506	**0.861**	0.415
Combination	0.577	0.524	**0.877**	0.471
Internalization	0.527	0.118	**0.570**	0.600
Tacit	0.191	**0.666**	0.427	0.023
Explicit	0.245	**0.651**	0.145	0.133
Program	0.755	**0.863**	0.478	0.533
Recruitment	0.121	**0.677**	0.436	0.152
System	0.402	0.276	0.277	**0.630**
Image	0.637	0.341	0.473	**0.924**
Concept	0.653	0.379	0.641	**0.857**
Patent	0.699	0.328	0.406	**0.844**
Contract	**0.876**	0.502	0.366	0.607
Satisfaction	**0.808**	0.476	0.599	0.551
Profile	**0.760**	0.529	0.419	0.626
Reform	**0.819**	0.447	0.553	0.635
Composite Reliability				

Source: proceed primary data (2019)

Table 2 shows that correlation value of items of socialization and internalization are below the correlation value of other items with variable of knowledge. Correlation value of item of system is below the correlation value of other items with variable of structural. It shows that items of socialization, internalization, and system are invalid. These three items have to be taken out from questionnaire.

Table3. Validity and Reliability Test

Item	Customer	Human	Knowledge	Structural
Externalization	0.347	0.525	**0.891**	0.42
Combination	0.577	0.522	**0.89**	0.49
Tacit	0.191	**0.707**	0.501	0.049

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Explicit	0.244	**0.644**	0.171	0.113
Program	0.753	**0.83**	0.466	0.505
Recruitment	0.122	**0.716**	0.519	0.161
Image	0.638	0.325	0.382	**0.932**
Concept	0.652	0.356	0.601	**0.859**
Patent	0.701	0.318	0.382	**0.881**
Contract	**0.88**	0.48	0.34	0.636
Satisfaction	**0.803**	0.447	0.514	0.523
Profile	**0.756**	0.508	0.358	0.608
Reform	**0.824**	0.426	0.495	0.66
Composite Reliability	**0.899**	**0.817**	**0.884**	**0.920**

After this research takes the invalid items out, all items are valid. Composite reliability of all variables are above 0.70 which shows items are reliable.

Hypotheses Test

Table4. Path Analysis

Path	**Coeff**	**t-statistics**	**p-*value***	**R^2**	**Notes**
Knowledge Creation -> Human Capital	0.588	7.677	0.000	0.346	H1 accepted
Human Capital -> Structural Capital	0.376	4.269	0.000	0.140	H2 accepted
Human Capital -> Customer Capital	0.339	4.009	0.000	0.567	H3 accepted
Structural Capital -> Customer Capital	0.620	9.427	0.000		H4 accepted

Source: proceed primary data (2019)

Based on table 4, knowledge creation has p-value 0.000 (significant in 0.01) on human capital. It indicates that knowledge creation affects human capital. H1, that states there is significant effect of knowledge creation on human capital, is accepted. Value of R^2 is 0.346 shows that knowledge creation can explain human capital 34.6%, while 65.4% of human capital is explained by other variables.

Human capital has p-value 0.000 (significant in 0.01) on structural capital. It indicates that human capital affects structural capital. H2, that states there is significant effect of human capital on structural capital, is accepted. Value of R^2 is 0.140 shows that human capital can explain structural capital 14.0%, while 86.0% of structural capital is explained by other variables.

Human capital has p-value 0.000 (significant in 0.01) on customer capital. It indicates that human capital affects customer capital. H3, that states there is significant effect of human capital on customer capital, is accepted. Structural capital has p-value 0.000 (significant in 0.01) on customer capital. It indicates that structural capital affects customer capital. H4, that states there is significant effect of structural capital on customer capital, is accepted. Value of R^2 is 0.567 shows that human capital and structural capital can explain customer capital 56.7%, while 43.3% of customer capital is explained by other variables.

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CONCLUSION

Based on data analysis, this research concludes that (1) knowledge creation affects human capital, (2) human capital affects structural capital, (3) human capital affects customer capital, (4) structural capital affects customer capital; in Bank Rakyat Indonesia branch Muntilan, Central Java, Indonesia. Limitations of this research are possibility of different questionaries' answers perceptions between respondents and this research perception, and limitation number of factors to determine customer capital. This research has implication for management of Bank Rakyat Indonesia branch Muntilan to improve modern banking services so human, structural, and customer capitals can be increased, further, it will increase organizational performance.

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