

**SET OF INDICATORS FOR BRIEF EVALUATION
OF INNOVATION CAPABILITIES OF SMALL AND MEDIUM
ENTERPRISES: INTERNATIONAL EXPERIENCE
AND SUGGESTIONS FOR VIETNAM**

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Abstract:

The objective of this study is to build up a set of indicators for brief evaluation of innovation capabilities for the sector of enterprises of Vietnam. For achieving this objective, first of all, the work was conducted for global study of documents on the notion of innovation and innovation capabilities of enterprises and the way to build up indicators of innovation capabilities of enterprises. This set of indicators is used for a test evaluation of innovation capabilities in 121 enterprises in three sectors: textile-garment, food processing and electro-electronic equipment of Vietnam. On basis of the process and outcomes of the test evaluation, this study comes to a conclusion that State agencies and enterprises can use the produced survey sheets and scoring system for brief evaluation of innovation capabilities of enterprises and sectors. It is also recommended that the survey sheets are not necessary to include questions of quantitative nature. The calculation of scores is not also to be assigned with different weights for components. In addition, some minor adjustments should be made in language plan in the actual survey sheets (which are mainly used for enterprises in sector of food processing) for use for enterprises in sector of service.

Keywords: *Innovation capabilities; Set of indicators for evaluation; Small and medium enterprise.*

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1. Introduction

Innovation, from long years, has been considered as important factor helping enterprises for existence, competition and success. Almost all the practical studies and surveys of enterprises show that the innovation leads to appearance of new products and services with better quality and lower prices (*Gamal, 2011*). But for conducting innovations, enterprises need to have innovation capabilities (*Lawson and Samson, 2001*).

The measurement of innovation capabilities of enterprises is an extremely important work. First of all, the measurement would help enterprises have clear visions to their existing capabilities, define advantages and weakness

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for next focused investments for optimization of innovation activities. Also, enterprises have backgrounds for comparison of their capabilities to the ones of other enterprises in the same sector, even in international plans, and to prepare suitable strategies. This measurement also provides important input information for planning work, answers for indicating motivation and hints for fixing difficulties which would lead to design most effective support policies and intervention measures for higher innovation capabilities of the sector. The measurement would set up rich database for research works and the evaluation and ranking activities help enterprises to enhance awareness by enterprises and communities on the important role of innovation which contribute to innovation activities by enterprises and promotion of innovation culture in general. It is the reason why many countries in the world conduct periodic surveys for evaluation of innovation capabilities of enterprises where the small and medium enterprises (SME) are majority. The typical case is the EU Community Innovation Survey (CIS), UK NESTA Innovation Index, Malaysian 1-InnoCERT, Korean InnoBiz, and IMP3roce of European Commission specifically designed for SMEs and etc.

In Vietnam, up to now, there is no large scale and regular surveys on innovation capabilities for enterprises in general and for SMEs in particular. Some surveys conducted by Vietnam General Statistics Office or Central Institute for Economic Management and partners (2013) were not focused on the topic of innovation. These surveys usually pay attentions to R&D investments by enterprises while, according to the results of those surveys, more than 90% of Vietnam enterprises do not have any innovation activities. This fact is easy to be interpreted by the small size of Vietnam enterprises. Innovation activities by small sized enterprises, in majority of cases, have a nature of innovation for their own enterprises or for their market only. They pay attentions to small innovations rather than large ones which always require heavy R&D costs.

On basis of incomplete information on innovation capabilities by Vietnam enterprises, we find necessary to build up a new frame and set of indicators extracted from methods developed and applied the world over for measurement of innovation capabilities of Vietnam enterprises. Specifically for SMEs, due to their great number and regularly changing nature, it is necessary to build up a set of indicators for brief evaluation of innovation capabilities, in addition to a full, deep and comprehensive set of indicators for innovation capabilities. Therefore, the target of this paper is to provide a global study on the ways to build up indicators for evaluation of innovation capabilities specifically used for SMEs which were realized locally and abroad. Then, a proposal is made to build up a set of indicators for brief

evaluation of innovation capabilities for sector of SMEs. For achieving this target, the following section provides analysis of the notion of innovation and innovation capabilities by enterprises. The next section considers methods and tools for measurement of innovation which are used in the world. Finally, a set of indicators is proposed for brief evaluation of innovation capabilities for Vietnam SMEs. This set was used for a test survey of innovation capabilities for 121 Vietnam enterprises in three sectors: textile-garment, food processing and electro-electronic equipment of Vietnam.

2. Theoretical overview

2.1. Notions of innovation and innovation capabilities

According to Schumpeter (1934), the innovation is a process where entrepreneurs introduce new combinations into markets. They may be new products, application of new production methods and new selling methods, opening of new markets, use of a new source of supply of input materials or a set up of new market structure.

Other definitions of innovation having appeared later basically inherited the above noted ideas by Schumpeter with adequate modifications to meet concrete targets of actual studies. In the present applied studies, the most used version of notion of innovation is the one provided by OECD/Eurostat (1992, 1997 and 2005) which was made public in Oslo Manual for collection and interpretation of data on technological innovation for purpose to measure scientific, technological and innovation (STI) activities. According to Oslo Manual (2005), the innovation is the process to introduce to application a new product or procedure, new marketing method, new organizational method or significant improvements in production and business activities. These organizations also consider that the minimal request for definition of innovation for products, procedures, marketing or organizational structures is their state of novelty or significant improvement. On basis of this definition, these organizations provide a classification of innovations at the level of enterprises into 4 categories: (i) Innovation of products; (ii) Innovation of procedure; (iii) Innovation of marketing; and (iv) Innovation of organizational structure.

Innovation capabilities of enterprises are defined as capabilities to organize resources for realization of certain innovations (*Neely et al., 2001*) or, in more details, as capabilities to turn continuously knowledge and ideas to new products, new procedures, new markets and new organizational structures for enterprises and their members to get benefits (*Lawson and Samson, 2001*).

In the most basic step to reflect the above said notions under forms of measurable activities, the innovation can be seen as a set of input elements of enterprises (Romijn and Albaladajo, 2000). Namely, innovation capabilities of enterprises are formed from many internal and external resources of enterprises. Internal resources include: knowledge background of entrepreneurs or managers of enterprises, skills of staffs and investments for R&D. External resources include frequent contacts with external factors, depth of these contacts and supports received from external factors.

For the next step, innovation capabilities should be viewed in the process of innovation. There exist many ways to view the process of innovation. In a traditional way, the process of innovation can be seen to include various segments such as invention, development and exploitation. Another way is to view innovations as an innovation value chain proposed by Hansen and Birkinshaw (2007). According to these authors, an innovation value chain includes three segments: creation of ideas, transformation of ideas to results and propagation of ideas.

In a deeper level, it is necessary to mention the context or the ambience which formed innovation capabilities (Nilsson et al., 2012). The ambience of innovation is a set of institutional factors such as common values, extent of freedom for creativity, level of stimulation, attitude to risks and etc. The creative ambience is seen as a component of innovation capabilities since it itself is the condition to help innovation to occur in higher rates.

2.2. Methods to measure innovation capabilities of enterprises

2.2.1. Theoretical frames for measurement of innovation capabilities of enterprises

Modern theoretical frames for measurement of innovation view the innovation in many dimensions and segments in the process of innovation instead of pure measurement of inputs and outputs of innovations of enterprises. The diamond shape model proposed by Tidd, Bessant and Pavit (2005) measures 5 dimensions of innovation capabilities including strategy, procedure, organization, linkage and learning. The diamond shape model makes focus on internal capabilities of enterprises themselves without taking the context and the ambience of activities by enterprises into consideration. This model helps introduce global evaluations on organizational and cultural structures of enterprises in promotion of learning and propagating knowledge, management and operation of process of development of products, process of setting up plans and strategies for realization of innovations and evaluation of innovations and, also, creation

of an innovation stimulating culture inside enterprises. This model, however, does not deal with capabilities of enterprises in commercialization of their own innovative products.

The frame of Oslo Manual developed by OECD and European Commission provides a very clear classification of forms of innovations which includes 4 categories (products-services, procedure, organization and marketing) of enterprises for purpose of a suitable approach for measurement. The latest version of Oslo Manual added innovations in sector of services which were not mentioned in previous versions of Oslo Manual and previous methods of measurement of innovation. This approach allows to measure inputs of innovation, links and roles of impacts and propagation of innovations (such as impacts to volumes of products, productivity and jobs in national and sectorial scales), driving and blocking factors of innovation activities, and demand-side factors. This frame offers conditions for measurement of innovation capabilities in national scale and allows getting benchmarks in international scale. Results of this method are highly useful for policy making (from information about the factors which orient innovation activities by enterprises).

The funnel shape model developed by Massachusetts Institute of Technology (MIT) by 2005 and the innovation value chain model proposed by Hansen and Birkinshaw (2007) can be applied more effectively for enterprises practicing the linear procedure of innovation rather than complex innovation procedures with various feedbacks and loops. As rules, the linear model helps enterprises to manage well innovations through the use of an enter-gate-like system which screen ideas (good and not good ones) for the next segments of the procedure. This can help secure the safety for organizational work but may be time consuming, and is more suitable for modification-type innovations rather than for breakthrough-type innovations. The weakness of these models is that they do not deal with external factors which also cause impacts to innovation capabilities of enterprises such as institution, infrastructure, market demands, level of competition in the sector of enterprises, support and competition governing policies, IP matters and innovation supporting measures by the Government.

2.2.2. Practice of measurement of innovation capabilities of enterprises in some countries

➤ EU Community Innovation Survey

The EU Community Innovation Survey (CIS) was designed on basis of the frame of Oslo Manual and conducted for the first time in 1992. Since 2008, this survey is conducted every 2 years in EU member countries at level of

enterprises. According to the CIS definition, an enterprise is considered to be innovative if it has at least one novel product or procedure for itself (Arundel, 2007). The collection of data is made on volunteer basis among the member countries and then the number of participating countries and the survey rounds may be different. These data are accessible from the EU statistic webpage (Eurostat, 2017).

This survey inspects various aspects of innovation activities such as products/services (new or considerably improved), application of new procedures and logistics, or modes of distribution (new or improved). The survey also provides information on the nature of innovation activities at level of enterprises, helps enterprises to have a deeper view on innovation procedure and impacts of innovation to economic activities. The questionnaires provide a set of indicators of content of innovation activities (products/services, procedure, organization and marketing), expenditures for innovations, impacts from innovations, supports by the Government, cooperation for innovations, information source of innovations, innovation promoting and preventing factors, motivation for innovation and methods for protection of IP rights.

➤ *NESTA innovation index*

National Endowment for Science, Technology and the Arts (NESTA) is the UK innovation foundation which was set up to promote innovation capabilities in UK. The foundation orients to support companies in early stages of establishment through supply of innovation related information and policies and encourage them to build up the innovation promoting culture inside enterprises. The NESTA indexes were built up since 2008 for determination of a series of indexes which reflect innovation capabilities in every sector and then help to compare innovation capabilities between sectors for identification of priorities of strategies and policies.

The set of NESTA indexes was set up on basis of the innovation value chain model by Hansen and Birkinshaw (2007) with end-to-end approach of innovation process, from investment by enterprises for knowledge to innovations and then created values. In this approach, innovation activities are viewed as a continuous process with three phases: investment for knowledge, realization of innovations and creation of values (commercialization of innovations).

NESTA builds 16 indexes at level of enterprises. 5 of them relate to the access to knowledge, 6 indexes relate to the creation of innovations and 5 indexes relate to commercialization activities. In some cases, the indexes get defined as multi-sectorial: the indexes can be applied for different sectors. But certain indexes can be applied for actual sectors only.

➤ *Innovation radar*

Innovation radar is a tool developed by Management Kellogg School including researchers Mohan Sawhney, Robert C. Wolcott and Inigo Arroniz (*Gamal, 2011*).

This tool was proven and applied for 40 companies in USA. This tool provides a global view on innovation process and the results show that the enterprises applying this business model gain better results than the ones focusing innovations for products or process.

The Radar introduces 4 aspects which play the anchor-like roles for business activities, namely:

- Supply of things the company creates (WHAT);
- Clients the company serves (WHO);
- Process of use (HOW);
- Market point used by the company for introduction of products (WHERE)

Largely stretching over these 4 aspects, enterprises can innovate their activities more than they can do if focusing innovations of technologies or products, namely: an enterprise can conduct innovations in 12 different dimensions. The innovation radar helps extend the scope of innovations by enterprises and show that “the innovation is to create new values but not new products”.

➤ *1-InnoCERT*

1-InnoCERT is a program orienting to promote innovation activities by enterprises in Malaysia. The program evaluates 4 basic aspects: Innovation capabilities, Commercialization capabilities, Innovation management capabilities and Innovation results. The program grants certificates for innovative enterprises on basis of certification of conformity of procedure and capabilities by enterprises to certain innovation standards. The granting of certificates is realized on the on-line system of self-evaluation of innovation which then gets certified through on-site auditing activities. 1-InnoCERT openly extends to all enterprises (SMEs and large scale companies) in 8 sectors including: engineering, service, bio technologies, design, ICT/software, agriculture, environment, green technologies (renewable energy and etc.) and construction.

➤ *InnoBiz*

Korea has implemented the system of technological innovation certification since 2001 to support SMEs to conduct innovations. The evaluation is

based on the OECD Oslo Manual. The procedure of evaluation includes 2 stages: on-line and on-site.

On-line self-evaluation (primary evaluation)

The evaluation work in this stage includes 4 aspects (technological innovation capabilities, technological commercialization capabilities, technological management innovation capabilities and innovation achievements) with about 60 questions.

The highest score is 1000 points and the enterprises gaining 650 points up get qualified for the further stage of evaluation.

On-site evaluation (realized by the technology ensuring foundation)

- Evaluation of technological innovation system (the highest score is 1000 points): with 700 points up, the enterprise gets qualified for the stage of technological level evaluation.

Here used the evaluation indexes applied for the self-evaluation stage and then the evaluation by special experts from Kibo Technology Foundation.

- Evaluation of deep technological level (the score is 10 points): with Class B and up granted, the enterprise gets qualified for supports from the Foundation.

The evaluation of deep technological level includes 4 main topics (technical capabilities of managers, firm standing ability of technologies, marketing capabilities, time extension and benefit gaining ability of business activities) with about 40 items.

There are ten levels for deep technology evaluation, namely: AAA, AA, A, BBB, BB, B, CCC, CC, C, and D.

➤ *IMP3rove - Europe Innova*

The project IMP3rove was set up since 2006 by European Commission for promotion of innovation by SMEs in Europe with targeted sustainable impacts. The project started with an analysis of innovation management practice and the best self-evaluation tools in Europe. The evaluation was conducted in systematic ways in all the dimensions of the “Innovation House of A.T Kearney”. It measures main factors necessary for success of innovation activities including innovation strategies, organization and culture, and life cycle management (including management of ideas, development of products, process of introduction of products and continued improvement).

IMP3rove applies the global approach for evaluation of innovation management as one of main factors to promote competitiveness. IMP3rove integrates on-line

evaluation, set up of standards, consulting services and continued management improvement. Results of evaluation work of enterprises are reported in detail in every dimension of innovation management works, compared to the best results and the middle results of enterprises listed in database. These reports are studied carefully by consulting experts for presentation during workshops which target to build up a road map for enhancement of effectiveness of innovation management by enterprises. The road maps need to identify the concrete objectives and ways for implementation works. The realization works by enterprises were monitored toughly together with the evaluation of impacts in short term time (immediately after consulting services completed) and in longer term time (after one year). The procedure is repeated after one year to ensure the continued improvement in the system of innovation management by enterprises.

2.2.3. Discussions on methods to measure innovation capabilities

Table 1 under here summarizes the models and tools for measurement of innovation capabilities of enterprises, main concerns of every model and remarks for application of these models. The diamond shape model is the frame to set up European IMP3rove for evaluation of innovation management by enterprises. The set of NESTA innovation indexes is based on the frame introduced by Oslo Manual. Every set of tools is focused on different core factors of innovation process with their own advantages. Every enterprise, evaluating organization and nation can consider and then integrate different components of the models and tools for their own purpose of use.

Table 1: Comparison of measuring methods for innovation capabilities by enterprises

Model	Tools	Focus	Dimensions	Remarks
Diamond shape	<ul style="list-style-type: none"> • IMP3rove 	<ul style="list-style-type: none"> • Innovation process • Activating factors • Links 	Strategies, process, organization, links and learning	Full model when innovation process still being in starting stages. This method focuses main dimensions of innovation process as well as institutional factors allowing innovations
Funnel shape		<ul style="list-style-type: none"> • Focuses on technological innovations or 	Strategic mindset, management of items and measuring tools,	Full model when having suitable innovation

Model	Tools	Focus	Dimensions	Remarks
		products • R&D procedure as core activities	research, proposal of ideas, learning clients, set up of targets, innovation development, market development and sales	procedure inside organization
Innovation value chain	• NESTA	• Management of ideas • Output results	Creation of ideas, transformation of ideas, propagation of ideas Collection of knowledge, building of innovations and commercialization of innovations	Emphasizing evaluation of outputs of innovation process
Oslo Manual	• InnoCERT • InnoBiz • EU Community Innovation Survey	• Innovations • Links • Outputs within certain time period	Innovation, links, demands, infrastructure, institutional frame and innovation policies	Highly useful when considering in national scale; convenient for international comparisons
	• Innovation Radar	• Outputs of innovations	Products/services, clients, procedures, marketing	Not ensuring sustainability of innovation procedures

Source: Summary by the team of authors

3. Building up the set of indicators for brief evaluation of innovation capabilities in sector of SMEs of Vietnam

Some methods of measurement for innovation capabilities were applied in Vietnam such as the set of tools i2METRIC (Quan Hoang Vuong et al., 2014) or the set of indicators for applied research (Phung Xuan Nha and Le Quan, 2013). These methods, however, lack a theoretical frame as background for building up of a set of indicators for evaluation then they are not really found to be convincing. Some research works by National Institute for Science and Technology Policy and Strategy Studies had touched innovation aspects (Nguyen Viet Hoa, 2008; Nguyen Viet Hoa, 2011; Tran Ngoc Ca, Nguyen Vo Hung, 2012); as well as innovation capabilities (Bach Tan Sinh, 2010) at level of enterprises. But these researches only deal with some aspects of innovation without systemizing the theoretical background and practical experiences of nations for building up of indicators.

In order to have a more global approach to innovation capabilities, first of all, we apply here the theoretical frame presented in Oslo Manual 2005 for innovation. Accordingly, the innovation is understood as activities to create new values for enterprises. The subjects of innovations to be considered here include: innovation of products/services, innovation of procedures, innovation of marketing and innovation of organizational structure.

The frame of Oslo Manual 2005, however, paid more attentions to outputs of innovation and links of enterprises with external factors (institutions and infrastructure, othe enterprises, sector of public research and training, and market demands). For evaluation of innovation capabilities of enterprises, we also pay attentions to macro levels of innovation procedures inside enterprises, from searching knowledge, creating innovations up to exploiting innovations. All of them reflect innovation capabilities of enterprises. Other theoretical models we have mentioned above pay more attentions to more aspects of innovation without focusing on outputs and links of enterprises with external factors. The funnel shape model, however, provides a too detailed classification of innovation procedures which are too difficult for application by SMEs having no so professional systems for practice. The innovation value chain model is found more suitable for SMEs when classifying only three main stages: (i) creation of ideas; (ii) transformation of ideas; and (iii) propagation of ideas (commercialization of innovations).

Therefore, we have proposed to build up the set of indicators for brief evaluation of innovation capabilities of Vietnam SMEs on basis of both Oslo Manual 2005 and the innovation value chain model which would reflect all the output aspects, links with external factors and internal procedure of innovation activities by enterprises.

3.1. Components of innovation capabilities

Synthesizing the above noted models and concrete applications in some countries, we propose the frame of innovation capabilities for Vietnam SMEs with 4 main components, namely:

(1) Innovation management capabilities (S):

- Factors supporting the creation of ideas (culture by enterprises to encourage the creation of new ideas and the sharing of knowledge inside enterprise, to respect ideas coming from external and internal sources and to search them);
- Factors supporting the development of ideas (procedure of selection of ideas for development, attitudes to risks, possibilities of in-time completion of projects, eagerness of management staffs for innovation projects);

- Factors supporting the propagation of ideas (possibilities for fast introduction of innovations into market before competitors do, capabilities to bring innovation results to distribution channels).

(2) Innovation learning and investment capabilities (I):

- External learning capabilities (capabilities to receive knowledge from suppliers, clients, research institutes/universities, Government organizations and agencies, vocational associations, exhibitions and fairs);
- Internal learning capabilities (capabilities to exchange knowledge inside enterprise, training of staffs);
- Investments for R&D activities (rate of investments for R&D activities, purchase of new machines and equipment);
- Efforts for innovation (seen through innovation projects implemented, halted, delayed, left and suspended).

(3) Innovation results (O):

- Results of innovation of products;
- Results of innovation of procedures;
- Results of innovation of organizational structures;
- Results of innovation of marketing.

(4) Capabilities for commercialization of innovation results (M)

- Investments for introduction of products into markets (rate of investments for it);
- Impacts of business results from innovation results (turnovers, market shares, relation with clients, satisfaction by clients).

3.2. Method of scoring for innovation capabilities

- Calculation of the scores for groups of components of innovation capabilities of enterprises:

$$S = \sum S(i); I = \sum I(i); O = \sum O(i); M = \sum M(i)$$

where: i - order number of indexes in the set of indicators;

$S^{(i)}$ - points of the i-th index in Group S;

$I^{(i)}$ - points of the i-th index in Group I;

$O^{(i)}$ - points of the i-th index in Group O;

$M^{(i)}$ - points of the i-th index in Group M.

- Calculation of the scores for component groups of innovation capabilities of enterprises:

$$I = S + I + O + M$$

Example: *The evaluation of an enterprise produces the following results: the group of capabilities for innovation activities management gains 25 points, the group of investment for development of innovation capabilities gains 12 points, the group of innovation results gains 13 points and the group of commercialization gains 15 points. We have:*

- *The total score of all the innovation components of the enterprise is:*

$$I = 25 + 12 + 13 + 15 = 65 \text{ points}$$

After having calculated the score for every enterprise, we summarized the results to make the average value of scores (or median) of enterprises. For evaluation of innovation capabilities of every sectors and make comparisons, we conducted the evaluation of every innovation component and global capabilities. The scores of every dimension of a sector are calculated as the average value (or median) of all the enterprises in the same sector. The sum of the scores of all the dimensions of the sector provides the final score of innovation capabilities of the sector (the lowest score is 0 and the highest score is 100).

3.3. Test evaluation of innovation capabilities of some SMEs of Vietnam

3.3.1. Results of test evaluation

We used the above prepared set of indicators for evaluation of 121 SMEs of Vietnam in 3 industrial sectors: food processing (42 enterprises), electro-electronic equipment (21 enterprises) and textile-garment (48 enterprises). They are those enterprises from which we receive replies to our survey sheets sent randomly to 950 enterprises over the whole country.

We should remark that the rate of replies is low (about 10% of the total of sent out questionnaires) which limits the accuracy of analyzing and scoring works. Therefore, the results from the test survey serve only for purpose to complete the produced method and set of indicators without making any conclusion for innovation capabilities of the 3 sectors as well as the sector of SMEs of Vietnam in general.

Table 2 summarizes the results of evaluation of innovation capabilities of enterprises in the survey of every sector. The score in every dimension of innovation capabilities of each sector was calculated by division of the average value of the dimension of the surveyed enterprises in the sector.

Globally, the innovation capabilities of the sectors are found in the middle level. However, the food processing sector has the best score of innovation capabilities with 60.92/100 points and the electro-electronic sector has the lowest score of innovation capabilities with 44.75/100 points. Regarding

component scores, only the innovation management capabilities in the food processing sector gains the high score, the one of electro-electronic sector gains the low score and all the remaining scores are of medium level.

The above noted results reflect partially the development status of these 3 sectors in Vietnam during recent years. Local enterprises in food processing and textile-garment sectors made breaking-out moves meeting well not only domestic demands but making great contributions to national export files. In the meantime the electro-electronic sector is dominated by FDI enterprises and import markets. Enterprises in this sector face difficulties while trying to enter the global value chains still controlled by FDI enterprises.

A comparison of components shows that the innovation management capabilities of enterprises in all the 3 sectors are better than other component capabilities. This fact shows that the SMEs get aware of innovation and wish to do innovation. In the meantime, the capabilities to create innovation get the lowest scores. This fact shows that it is difficult for SMEs to create innovation results. The shortage of investment capitals remains one of the difficulties for enterprises to make investments for innovation.

Table 2: Comparison of innovation capabilities of enterprises in the 3 sectors

	Max. score	Food processing	Textile-Garment	Electro-Electronic	Score range
Number of surveyed enterprises		42	48	21	
Innovation management capabilities	30	20.38	17.78	18.73	High: >20 Medium: 10-20 Low: <10
Innovation learning and investment capabilities	20	11.98	10.23	9.44	High: >13.3 Medium: 6.7-13.3 Low: <6.7
Innovation result creation capabilities	20	11.01	11.25	5.95	High: >13.3 Medium: 6.7-13.3 Low: <6.7
Innovation result commercialization capabilities	30	17.54	15.81	10.62	High: >20 Medium: 10-20 Low: <10
Global innovation score	100	60.92	55.06	44.75	High: >66.6 Medium: 33.4-66.6 Low: <33.4

Source: Summary from survey data

3.3.2. Notes for methods of evaluation and measurement indexes

During the survey process and data assessment for evaluation of innovation capabilities of SMEs of Vietnam in the 3 sectors we made some notes.

First, in a global view, majority of enterprises do not face difficulties while giving answers in qualitative forms. Only about 10% of the surveyed enterprises did not complete fully the survey sheets. During the direct and deep interviews, the enterprises stated that they can complete all the questionnaires.

Some enterprises, however, find difficult to give answers to innovation related questions for services. They have trends to be confused between the service package they supply to clients (for use) and the package of client care service (for marketing and/or after sales activities). In order to avoid eventual confusions, we think to include in questionnaires only the questions for main products/services offered by enterprises for clients.

Second, the calculated scores reflect relatively right innovation capabilities of the enterprises with which we conducted deep interviews. Many enterprises in food processing and textile-garment sectors stated that they have chances to learn too much from foreign partners while only a minor number of enterprises in electro-electronic sector have these chances. Almost all the entrepreneurs feel eager with innovations but say not to see many real results. The investments for implementation of innovation activities face difficulties in capital mobilization. Majority of enterprises pay attentions for improvement in organizational aspects (looking for partners for cooperation of development or management models to cut down costs). Improvements for products and marketing activities go slowly for changes.

Third, the works for summary of data and calculation of scores are found easy since they are indicated clearly in survey sheets. With the weight defined for every component and the data filled in survey sheets we can make a brief evaluation of innovation capabilities of enterprises which allows policy making authorities or competent agencies to screen fast the enterprises in needs of supports.

Fourth, the determination of weights for components seems to be not found too important. In this study we had assigned higher weights for Innovation management capabilities (30 points) and Innovation commercialization capabilities (30 points) which are higher than Innovation learning and investment capabilities (20 points) and Innovation creation capabilities (20 points). The results of simulated calculations where the weights change inversely the global quantitative picture does not change so much. Therefore, for purpose of brief evaluation we can simplify the procedure by giving the same weights to components.

Fifth, there is a considerable number of enterprises which do not give answers to our questions of quantitative nature in survey sheets (number of innovations, number of left projects). This fact shows that enterprises have trends to decline from questions of quantitative nature. Therefore, for purpose of brief evaluation of innovation capabilities of enterprises, we do not think necessary to include quantitative questions in survey sheets.

4. Conclusion

Our research work is among the common efforts of domestic researching community and policy making organizations to build up a set of indicators of innovation capabilities of Vietnam enterprises. Before that, many researches were made with their own approaches to measure innovation capabilities of Vietnam enterprises. In this research work we follow the approach based on Oslo Manual 2005 and the Innovation value chain to build up a set of indicators to meet the nature of Vietnam SMEs. Namely, the survey sheets were designed to be short and easy for enterprises to deal with. Calculation and analysis works were conducted simply and fast then the administrative organizations and leaders of enterprises can have a brief evaluation of their own enterprises or sectors.

We had tested our measurement model through trials made for innovation capabilities of enterprises in 3 sectors of priority of Vietnam. Results of the test evaluation show that State agencies and enterprises can use the survey sheets and the scoring system, we offer, for brief evaluation of innovation capabilities of their enterprises and sectors. On basis of survey and interview process, we recommend not necessary to include questions of quantitative nature. It is not necessary also to assign different weights for components. In addition, we think to make minor adjustments of language plan in survey sheets when using them for enterprises in sectors of service./.

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