THE ANALYSIS OF TECHNOLOGICAL CONTRIBUTION AND COMPETITIVENESS OF COKROTELA CAKE COMPANY YOGYAKARTA TO SUPPORT GREEN AGROINDUSTRY

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THE ANALYSIS OF TECHNOLOGICAL CONTRIBUTION AND COMPETITIVENESS OF COKROTELA CAKE COMPANY YOGYAKARTA TO SUPPORT GREEN AGROINDUSTRY

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ABSTRACT

CokroTela Cake is the only company in Yogyakarta that produce various cakes made of modified cassava flour. There is no waste in the processing technology because the waste has been processed for feed production. Thus, CokroTela Cake Yogyakarta supports green agroindustry. The objective of this research was to analyze the Technological Contribution and Competitiveness of CokroTela Cake Company Yogyakarta. Descriptive method was used for this research. Respondents were determined by purposive sampling method. The methods involved observation, interview and distributing questionnaires to collect data, then data were analyzed by using Technometric Model. The model focused on assessment of four technological components, i.e. technoware, humanware, infoware and orgaware to compare their sophisticated, state of the art, contribution component and contribution intensity. These values were used to calculate Technological Contribution Coefficient (TCC). The company competitiveness was determined by using product innovation and productivity approach. The result of this research showed the highest contribution was humanware followed by infoware, orgaware and technoware, respectively. The TCC value was 0.684, thus, CokroTela Cake Yogyakarta was classified into a good and semi-modern competitive company.

Keywords: CokroTela Cake, technological contribution, technological component.

INTRODUCTION

The effort of promoting the use of local food such as cassava has been obviously practiced recently. The example of successful project is the use of mocaf (modified cassava flour). It is a cassava derivative product which is obtained by modifying the cassava cells fermentation, as food ingredient and wheat substitution on noodles, biscuits, cakes, and breads product (Achmad-Subagio, 2008).

The process production of mocaf is quite simple, similar with the production of common cassava flour but followed by fermentation process, thus that it only leaves cassava peel as waste.

Cokrotela cake which was built in 2010 is the only company that produces cake with 100% mocafas raw material in Yogyakarta.

Achmad-Subagio (2008) proposed in the matter of mocaf use that in order to produce optimal quality of cakes product, formula modification is needed. The modification that is applied at Cokrotela Cake is by adding more eggs than cake recipe in common (using

wheat flour). Thus, the process in Cokrotela Cake Yogyakarta only leaves cassava peels and egg shell. These wastes then can be used as feed raw material so that CokrotelaCake Yogyakartabelongs to Green Agro-industry.

Cokrotelo cake product with variants such as pandan, chocolate, strawberry, blueberry, peanut, cheese, mocca, and bikaambon, is well-liked by the people because of its delectable flavor so that it becomes popular product as unique food souvenir from Yogyakarta (www.cokrotelacake.com).

This product is processed in the factory located in Jl. HOS CokroAminoto 97 and distributed through 6 outlets that are spread in Yogyakarta area. The combination of shape and cake flavour that suits the consumer taste with 100% local product as raw material is an innovation process that cannot be separated from the technology component touch and contribution so that it can contend in the competitive cake production in Yogyakarta. Meanwhile, the competitive advantage cannot be separated from the innovation of technology as artificial resource which is competitive and always developed (Gumbira-Said, 2001).

Technology estimation on agro-industry needs to be performed continuously because technology is one of the fundamental aspects to have a competitive power (Khalil, 2000). Evaluation of technology can be a bench marking towards the best industry (Lowe, 1995).

Based on the explanation above, the objective of this research was to analyse the contribution of technological component and competitiveness of Cokrotela Cake Company Yogyakarta to support green agro-industry.

MATERIALS AND METHODS

This research was performed in Cokrotela Cake Company Yogyakarta on August – November 2011 and the materials used were all components of technology which were involved in the process of cake production.

This research used descriptive method with selected employee as respondents that were determined purposively. Data were obtained from observation, interview, and questionnaire, and then analysed by technometric method to determine the technology contribution (UNESCAP, 1989). While the competitiveness is determined by using product innovation and productivity approach (Nazaruddin, 2008).

Technometric model is focused on the four technological components measurement so that it produces technological contribution coefficient (TCC) that can be used to determine the contribution classification and the technology level. (Sinaga, 2011). The four technological components are technoware, humanware, infoware, and orgaware that are correlated one to each other (Gumbira-Said et al., 2004). The steps of technology components contribution measurement according to Nazaruddin (2008) include:

1. The determination of technology components sophistication used value (score) ranged from 1-9; from this step, lower/L and upper/U limit value for each component will be obtained.

2. The study of technology components complexity (state of the art = SOTA). In this step, ST,SH, SI, SO value will be obtained through formula:

$$S_T = \frac{1}{10}\left\{\frac{(\sum_{k=1}^{kt} nk)}{kt}\right\};\quad S_H = \frac{1}{10}\left\{\frac{(\sum_{l=1}^{lh} hl)}{lh}\right\}$$

$$S_I = \frac{1}{10}\left\{\frac{(\sum_{m=1}^{mi} lm)}{mi}\right\};\quad S_O = \frac{1}{10}\left\{\frac{(\sum_{n=1}^{no} on)}{no}\right\} \qquad \text{……..(1)}$$

where:

ST, SH, SI, SO= SOTA componentsTechnoware, Humanware, Infoware andOrgaware
k, l,m,n= criteria value on technology components level
kt, lh, mi, no = criteria amount on technology components

3. The determination of contribution for each technology components by using formula:

$$T = \frac{1}{9}(L_T + S_T (U_T - L_T) \}$$

$$H = \frac{1}{9}(L_H + S_H(U_H - L_H)\} \qquad \text{……..(2)}$$

$$I = \frac{1}{9}(L_I + S_I(U_I - L_I) \}$$

$$O = \frac{1}{9}(L_O + S_O (U_O - L_O) \}$$

4. The study of contribution intensity for each technology components.
In this step, dual matrix from the questionnaire result is developed until β value is obtained for each component(βt, βh, βi, βo) by using Software Expert Choice.

From the four steps above, TCC is measured by using formula:

$TCC = T^{\beta t} \times H^{\beta h} \times I^{\beta i} \times O^{\beta o}$ ……(3)

While the measurement of competitiveness that is based on productivity uses formula:

$$\text{Multifactor productivity} = \frac{\text{output which is produced}}{\text{total input which is used}} \qquad \text{……..(4)}$$

(Nazaruddin, 2008)

RESULT AND DISCUSSION

A. Analysis of Technology Contribution

1. The analysis result on themeasurementof technology components sophistication level is showed by lower limit (L) and upper limit (U) value which are listed on table 1.

Table 1. Lower and Upper Limits of Technological Components

Components	Lower limit	Upper limit
Technoware	2	5
Humanware	6	9
Infoware	5	8
Orgaware	5	7

The sophistication levels which are presented on table 1 show that the lowest lower limit was technoware. This is related to the equipment used in the transformation process from raw material to product which is mostly manual so that the complexity level is low and only mixer which has specific function. While the highest upper limit was humanware component. This is apt with the fact that human resources especially at the management level has been already have innovation thinking on many kinds of production process idea or product diversity, and the innovation is actually exist on the wheat substitution into 100% mocaf so that it can produce cake product which is made from local raw material but has national/global reputation.

2. The analysis result by using formula (1) on the SOTA analysis for each component is shown on table 2.

Table 2.SOTA value of technology components

Component/Symbol	State of the Art (SOTA)
Technoware/S_T	0,792
Humanware/S_H	0,734
Infoware/S_I	0,797
Orgaware/S_O	0,914

State of the art (SOTA) is the measurement of complexity level from each technology component on the transformation process. It is shown on table 2 that the value of all of the technology components is above 0.5 meaning that the complexity level is good, as proposed in UNESCAP (1989).

3. The analysis result by using formula (2) on the measurement of Technology component contribution is shown on table 3.

Table 3.Technology Components Contribution

Component/Symbol	Contribution Value
Technoware/T	0,486
Humanware/H	0,910
Infoware/I	0,821
Orgaware/O	0,759

The analysis of technology components contribution is used to measure the contribution value of each component toward the technological component coefficientvalue, based on the formula that is used to measure the contribution valueis much related to the technology components sophistication level.

As shown on table 3, the highest contribution is humanware. It means that human resources play an important role in the management of transformation process; this is apt with the technology sophistication data. The contribution of infoware is in the second place because in fact, the marketing information in CokroTela Cake companyis very clear, through brochure, catalogue, or website, able to ensure the buyer/consumer that with 100% mocaf as its raw material, the product is good for health because of the antioxidant content which can prevent tumor or cancer.

Meanwhile, the information on the production process in the form of cake production SOP (Standard Operation Procedure) is very clear so that the quality control can be performed well.Based on the technology sophistication data, orgaware is in the third place because CokroTelaCake companyis concentrated more on the stabilization of production process, has not reached the level of maintaining intensive relation with fixed buyer/relation/consumer. Technowareis in the last place of contribution possibly because of the production process equipment which is still dominated by manual equipment.

4. The analysis result, using Software Expert Choiceto, determine the technology components contribution intensity is shown on table 4.

Table 4.Technology Components Contribution Intensity

Component/Symbol	Value
Technoware/βt	0,405
Humanware/βh	0,377
Infoware/βi	0,080
Orgaware/βo	0,138

Inconsistency ratio = 0.08

Technology contribution intensity is developed based on the intensity level of one component towards other components. The result shows that there is inconsistency ratio that is a parameter to examine whether the improvement of intensity measurement by the management is consistent or not. If the inconsistency ratio ≥ 0,1, it will be considered as inconsistence (the policy for technology component improvement is not consistent). Based on the inconsistency ratio = 0.08, the intensity improvement made by Cokrotela Cake management is consistent enough.

In the production process, equipment surely has high contribution intensity on the product, so that it has the highest intensity value. Either the humanware, its

contribution intensity is in the second place possibly because the human resources in the production process at the operator level has not been proficient enough to repair the broken equipment on their own so that the external backup is still needed.

Based on the humanware sophistication level, the operator is still at production level, has not reached the improvisation level yet.

5. The measurement of TCC value by using formula (3) is 0.684.

   According to Saaty (1993)andFauzan (2009)about the range of TCC value0,5> TCC ≥ 0,7, the result shows that the technology contribution is in a good classification and the technology level on the range of 0,3 > TCC ≥ 0,7 is considered as semi-modern category.

B. Competitiveness Analysis

The measurement result of CokroTela Cake productivity per month by using formula (4) is shown on table 5.

Table 5. Productivity real and target/ month

	Value (Rp)	Productivity
Output (real)	354.188.000,00	1,72
Input (real)	206.226.796,31	
Output (target)	342.450.000,00	1,66
Input (target)	206.006.496,31	

Table 5 shows that with productivity > 1, CokroTela Cake is profitable. Because the real productivity is higher than the target productivity, CokroTela Cake is considered as Agro-company which has competitiveness. Considering from the technological aspect, competitiveness advantage cannot be separated from technology innovation (Gumbira-Said, 2001).

According to Michael E. Portercit, Daryanto (2011), there are twelve pillar of competitiveness power, including technology alacrity and process innovation. Looking at the cake product which has utilized 100% mocaf, it is considered as an innovative technological process output and the idea from CokroTela Cake general manager/owner to utilize local food resources is very responsive in facing the technological change. Therefore,CokroTela Cake in Yogyakarta is categorized as competitive company.

CONCLUSION

a. Based on the contribution value measured by technometric model, the highest contribution ishumanware, followed by infoware, orgaware and technoware, respectively.

b. Based on TCC value = 0.684, CokroTela Cake is classified into good and semi-modern technology level.

c. Based on the real productivity and target productivity, CokroTela Cake is classified into competitive company.

REFERENCES

Daryanto, A. 2011 Improving The Enabling Environment for Agribusiness and Agroindustry Competitiveness MB. IPB. Bogor

Fauzan, A. 2009.Penilaian Tingkat Teknologi DOK Pembinaan UPT BTPI. Muara Angke Jakarta IPB, Bogor

Gumbira- Sa'id. 2001. Penerapan Manajemen Teknologi dalam Meningkatkan Daya Saing Global Produk Agribisnis/Agroindustri Berorientasi Produk Berkelanjutan. Orasi Ilmiah Guru Besar Teknologi Industri Pertanian, FTP-IPB

Gumbira-Sa'id, Rachmayanti dan MZ Muthaqin. 2004. Manajemen Teknologi Agribisnis: Kunci menuju Daya Saing Global Produk. Penerbit PT. Ghalia Indonesia Jakarta.

Khalik, T.M. 2000. Management of Technology. The Key to Competitiveness and Wealth Creation. McGraw Hill Book Co. Singapore

Nazaruddin. 2008. Manajemen Teknologi. Graha Ilmu. Yogyakarta

Porter, M.E. 2008.Competitive Advantage (Keunggulan Bersaing).Translation. Kharisma Publising Group. Jakarta.

Saaty, T. L. 1993. Pengambilan Keputusan bagi para Pemimpin.Translation Liana Setiono.Seri Manajemen No 134.PT. Pustaka Binaman Pressindo. Jakarta

Sinaga, T.S. 2010. ManajemenTeknologi http:// Tutisarma Sinaga. Wordpress. com. accessed. December 1, 2011

Subagio, A. 2008. Modified Cassava Flour (Mocal): Sebuah Masa Depan Ketahanan Pangan Nasional Berbasis Potensi Lokal. Rubrik.Teknologi Pangan Edisi No 50/XVII/Januari–Juni

United Economic and Social Commision for Asia and Pasific (UNESCAP). 1989. Technology Content Asessment Bengalore : APCTT

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