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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

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CRITICAL SUCCESS FACTORS FOR INNOVATION: AN EMPIRICAL ANALYSIS ON TEA INDUSTRY IN SRI LANKA

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ABSTRACT
The main purpose of this study is to determine the factors which significantly influence innovativeness of tea manufacturing and exporting firms in Sri Lanka. The research model is totally based on the knowledge obtained from literature and it consists with main three factors, corporate culture, working environment and networking. In order to test the model, primary data were collected through e-mail from the CEO/Owner of tea manufacturing and tea exporting firm using a structured questionnaire. Discriminant analysis and cross-tabulation analysis were performed to determine the significant difference between means of responses from more or less innovative companies. Findings of the study revealed that the drivers of innovation in tea manufacturing and exporting firms are corporate culture, working environment and networking. The main barriers for innovation of both more and less innovative companies are financial constraint and qualified human resources.

KEYWORDS
Innovation, Tea Industry, Discriminant Analysis.

1.   INTRODUCTION
1.1 TEA INDUSTRY
Among the export composition, tea, as the highest net foreign earning sector, provides significant contribution to the country's economy. It is the third largest agricultural industry and second largest exporter in Sri Lanka. Sri Lanka tea industry celebrates 146 years of commercial history in 2013. As the highest net foreign exchange generator, tea is considered to be the most important agri-business in the country. It also accounts nearly 10 percent contribution to national output, nearly 15 percent contribution on export earnings and generates more than 10 percent employment opportunities directly and indirectly (nearly 2 million employed) (SL Tea Board, 2014). Sri Lanka is one of the leading tea exporting country in the world. Since the global tea market is very competitive, the tea industry in Sri Lanka has not performed well in the global market, especially concerning about the global market share, compared to other tea exporting countries like; Kenya, China and India. During the last decade, the country's relative position in terms of export market share shows a considerable decline (Table: 1.1).

TABLE 1.1: MARKET SHARE OF THE MAJOR TEA EXPORTING COUNTRIES

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sri Lanka	25.7	22.5	21.6	22.1	20.9	22.6	22.9	21.6	20.4	20.3	20.0	19.1
Kenya	5.6	16.1	13.7	15.6	15.8	15.5	16.9	16.4	18.2	18.5	18.9	19.7
China	13.1	12.3	12.9	13.3	13.1	13.4	12.4	12.9	12.3	14.4	16.5	17.2
India	12.8	10.5	11.3	10.6	9.9	9.6	10.2	10.2	10.9	12.9	12.9	12.8

Source: International Trade Centre (2014)

A major issue for tea industry in this position and particularly for those in existence for some years is how to survive by maintaining or increasing market share. Since 2002, the tea industry was reported to have experienced a slow space of market share, thus in order to survive and maintain its competitiveness, innovation is fundamental. Innovation is considered as a fundamental component of business success. According to several specialists, innovation is now unavoidable for companies which want to develop and maintain a competitive advantage and sustain it (Bigliardi and Dormio, 2009).

Schumpeter (1947) stated that the differences and connections among invention, innovation and competition. Innovation strengthens competitiveness of companies and competition derives companies to be more innovative. As we know, tea is the most competitive product in the beverage industry. Sri Lanka tea faces enormous competition from countries like; Kenya, India, Vietnam and China. When competition is high, companies need to more concern on innovative strategy for their product, process and market. Tea industry is generally viewed as a mature, slow-changing and relatively low technology industry. However, it is clear that tea industry regards innovation as essential.

1.2 OBJECTIVE OF THE STUDY
It is clear from trade statistics that Sri Lankan tea industry is struggling with competitive position in tea export market. More competition derives companies to be more innovative. So, this reality derives to study how far companies, which engage in tea industry, are innovated in terms of product, process and market. In addition to that, it needs to identify the determinants of innovativeness in tea industry of Sri Lanka. Then, the main objective of this study is to identify the drivers of innovation of tea industry in Sri Lanka.

The paper outlines literature review on innovation and factors contributing to successful innovation, discussion of methodology and presentation of findings. Conclusion and discussion are drawn based on the analyses of results.

2.   LITERATURE REVIEW
2.1 INNOVATION
A critical issue facing companies today is how to create and maintain a sustainable competitive advantage within a turbulent and complex business environment. Innovation is unavoidable for companies which want to develop and maintain a competitive advantage (Stock *et al.*, 2002). The term 'innovation' was used for

the first time by Schumpeter at the beginning of the 20th century (Hana, 2013, p.83). Schumpeter defined innovation as product, process and organizational changes that do not necessarily originated from new scientific discovers. In other words, it is the creation of new combination.

As Kuczmarski (1996, p.7) stated, "Innovation cannot touch, smell, hear, see or taste, but [we] can sense, think and feel innovation. Innovation is best described as a pervasive attitude that allows business to see beyond the present and create a future vision". According to that definition innovation is the single best way to leapfrog competition, move ahead of the industry peak and most important, create new ways to bolster profit margins and fuel future earning streams. According to Bigliardi and Dormio (2009), innovation is defined as the successful introduction of something new and useful.

Innovation has experienced a remarkable change in recent years (Ongonga and Ochieng, 2013). There are five dimensions of innovation namely; producing new products, introducing new production methods and new process, exploiting new market, developing new raw materials and introducing/redesigning new organization. On the other hand, the significance of the spillovers of knowledge from external sources has been increasingly recognized in the process of innovation

As Bigliardi and Dormio (2009) mentioned, innovation has been studied in a variety of context, including in relation to technology, commerce, social system and economic development. Innovation may arise from a combination of already existing technology and its application in a new existing technology and its application in a new context (Hana, 2013). Based on this definition, innovation is not a pure application of new technology. Any slight improvement in product, process, and organizational changes may be considered as innovation. Johannessen et al (2001) also divided innovation into six categories such as; new product, new service, new production method, new market, new source of supply and new ways of organizing.

Based on the above definitions, innovation can be defined as an ongoing process of developing, improving, and exploring new product, process and market. Operation definition of innovation is developing new product or process or improving existing product or process.

2.2 DETERMINANTS OF INNOVATION

It the literature, various classifications of innovation have been developed. As Bigliardi and Dormio (2009) mentioned, there are four domains of innovation namely; product innovation, process innovation, organizational innovation, and market innovation. Product innovation is any good, service or idea that is perceived by someone as new. Shepherd and Ahmed (2000) defined product innovation as the art of designing something that a customer desires which can be produced to a standard and price acceptable to both customer and supplier alike in as short a period of time as possible. Process innovation is the adaptation of existing product line as well as the installation of an entirely new infrastructure and the implementation of new technologies. Organizational innovation is changing marketing, purchase, sales, administration, management and staff policy. The exploitation of new territorial markets and the penetration of new market segments within existing markets are known as market innovation.

There are several factors affecting to innovative strategy in the firms. As Dodgson and Rothwell (1991) identified, promoting a corporate culture, creating structure reflecting in the effective use of systems, analyzing competitors, and developing cooperation and partnership were success factors for innovative strategy. Birchall et al., (1996) emphasized that lack of bureaucracy, efficiency, informal communication, flexibility, close working relationships with customers, analysis of competitors, and supervisory and reward system support to be most relevant to innovation.

According to Romijin and Albaladejo (2002) educational background and work experience of management, qualification of workforce, research and development and training were internal factors affecting innovativeness of companies.

Avermaete et al., (2003) carried out a study to identify the patterns of innovative activities and determinants of innovation in food firms in Belgian. The study included five indicators of innovation; product innovation, process innovation, certification of Hazard Analysis and Critical Control Point (HACCP), ISO 9000 certificates and participated in the organic food chain. Findings of the study revealed that innovation depended on the age of the company, company size and regional economic performance. In addition to that, the analyses show that product innovation typically accounted for a significant percentage of the firm's turnover. In other words, innovations are profitable.

Blumentritt (2004) mentioned that, fostering a creative environment, the right leadership, listen to new ideas, top management play multiple roles, and the right organizational system were also important to have successful innovation. Koellinger (2008) revealed that the education background of the business owners is an important factor explaining innovation in organization. Laforet and Tann (2006) suggested that, culture, process, leadership (CEOs'/owners' commitment to innovation) and company strategic orientation were the factors contribute to innovative management in small manufacturing firms. They indicated that there was a correlation between corporate culture and process innovation. In addition to culture, process and commitment, firm's size, age and flatter hierarchies were found to have effects on company innovativeness. In this study, customer dependency, lack knowledge and skills, training, networking and lack of financial resources were identified as main barriers for innovation.

Bigliardi and Dormio (2009) carried out an investigation to identify technological innovation determinants in food machinery industry in Italy. Results of the study revealed that collaboration with universities and research centres are important factors for innovation.

Hana (2013) also highlighted that people generate ideas that might help an organization gain a competitive advantage at least for a certain period of time. Therefore, innovation capability of an organization depends on its intellectual/knowledge assets and its ability to employ these assets. Outcomes of the study indicated that successful innovations are never a one-off event, but a result of a long-term process in which the human factor plays an important role. Innovation can only turn out to be successful if they are supported by top management and if an innovative creative team is composed of knowledge employees. The study finally concluded the without the right people with knowledge and experience, it is impossible to achieve the required level of innovations. Employee development through inside and outside training also play important role on innovation.

To determine which factors significantly influence innovativeness of companies Gungor and Gozlu (2012) examined internal and external determinants of innovation for Turkish companies. The results indicated that research and development activities, licensed technology usage, formal training programmes and experience of managers were significant internal determinants of innovation, international relation is a external factor for company's innovative strategy.

Negassi and Hung (2014) examined the determinants of innovation output in manufacturing industries in public and civil sector. In this study, researchers used mid/long-term models of competition, which are based on the production capabilities, choice of product line, research and development and the innovation of the firms. Several variables were used such as; market share, profits, capacity to self-finance, advertising expenditure, and number of granted patents. Based on the results of the study indicated that public sector competition index is not correlated with innovation. The main objectives of innovation of public sector firms are to improve product quality and extend product line. In contrast, civil sector's competition index is positively and strongly correlated with innovation. In addition to that, large firms in civil sector are more likely to introduce an innovation, mainly product and process innovation. In fact, civil sector seeks to explore new market and market drives innovation output.

There are many factors identified in previous which influence innovativeness of companies (Gungor and Gozlu, 2012). However, the results of these studies are still contradiction and drive opportunities for researchers to examine more in this area. The determinants of innovation can be differed with respect to the nation and industry. All the factors identified by the previous studies are included into promoting an innovative culture. The present study concerned product, process and market as a combination to identify the company's innovation.

2.3 INNOVATION AND TEA INDUSTRY

Literature also identified that innovation is vital factor for tea industry. The main objectives of Ongonga and Ochieng (2013) were to identify innovative strategies adopted and determine the effect of innovation on performance of tea firms in Kenya. The study sought to establish the relationship between innovation and organizational performance in tea industry. The study revealed that outputs of innovation are increased revenue and minimized labour cost. In the tea industry, these outputs can be achieved through application of innovations into various inputs in the companies. The innovative inputs in the tea companies include new technology of harvesting tea, highly skilled manpower, and new production techniques. During the last two years, the applications of harvesting machines and farming system have been outstanding developments in tea sector in Kenya. These strategies adopted resulted into increased revenue, high productivity levels and reduced costs.

Ethugala (2011) studied the determinants of business excellence of tea industry on Sri Lanka. The study concluded that relationships within the governance of the tea sector have had a significant impact on industry's income due to lack of coordination and cooperation in team efforts. Poor management relationships

led to resulting poor productivity. Tea sector operates as a combination of several partners; public, private and civil sector. Interrelations among these sectors ultimately affect the response on public and the team effort to change of workforce composition.

Herath and De Silva (2011) studied the most prominent strategies adopted by the firms to gain competitive advantage in value added tea industry. The study conducted was based on case studies of nine tea companies. Data was gathered through interviews conducted with the CEOs of the companies. Respondents discussed different strategies adopted by their firms to win the competitive advantage. The study revealed a variety of marketing and innovation strategies adopted by the firms. The results of the study indicated that brand building, niche marketing, product differentiation, cost leadership and customer focus were the most important strategies to gain competitive advantage in tea industry. Researchers also highlighted that firm's capabilities and innovations found vital for the value added tea export firms to achieve business success as well as to make substantial contribution to the Sri Lankan economy.

According to Herath and De Silva (2011), innovation is fundamental in gaining competitive advantage, combining the innovative efforts with appropriate strategy is found as vital for winning the competitive markets. Then it is more vital to identify how far tea companies are innovated and what factors influencing firms to being more innovated.

3. METHODOLOGY

3.1 CONCEPTUAL MODEL

The conceptual model in this study is build upon knowledge adopted from literature. The proposed model consisted with three factors as possible determinants of innovation; corporate culture, working environment and network. Each factor included more than four variables. All factors investigated in this study are listed in table 3.1 and it includes the factors, related variables and scales.

TABLE 3.1: FACTORS AND RELATED VARIABLE

Factor	Related Variable	Scale	
Corporate culture	CEO/Owner involves in new product development CEO/Owner involves in developing new process CEO/Owner involves in exploring new market	1- 2-	Yes No
Working environment	New product development team Regular discussion Market study In-house training provide to employees Outside training provide to employees	1- 2-	Yes No
Networking	Information sources Membership Collaborative training programmes Associate with research institutes	1- 2-	Yes No
Innovation	Number of new product ideas generated Number of new product(s) launched Number of product improvements discussed Number of product improvement completed Number of innovation prizes won Investment in new machine equipments Upgrade production system Investment in R & D Exploring new markets (local and Foreign)	Number Number Number Number Number 1- 2-	Yes No

Source: Laforet and Tann (2006), Bigliardi and Dormio (2009), and Gungor and Gozlu (2012)

Twelve indicators derived from the literature were used as measurement techniques of company's innovativeness. Each indicator allocated a specific score. As Laforet and Tann (2006) undertook, top 20 percent companies which scored high on the 12 criteria, were compared with the bottom 80 percent companies which scored low on the same criteria. Top 20 percent companies were referred as 'most innovative companies' and bottom 80 percent referred as 'less innovative companies'. However, in this study, the companies which scored high on the innovation measurement criteria were categorized as 'more innovative' companies, the latter as 'less innovative' companies.

3.2 DATA COLLECTION AND ANALYSIS

Quantitative research approach was employed to conduct this study. Population of the study consisted with individual companies operating in tea industry in Sri Lanka. In here, companies were mainly concerned on tea manufacturing and tea exporting. An overall population of 392 companies was obtained from Export Development Board of Sri Lanka and Sri Lanka Tea Board. There are 156 companies who are exporting tea and 236 companies engage with tea manufacturing. Sample of the study consisted with 150 companies, 50 companies from tea exporting firms and 100 from tea manufacturing firms. Simple random sample technique was employed to select sample from the target population. CEO/Owner who is identified as being responsible of innovation was taken as sample unit of the study.

Primary data was collected using structured questionnaire through e-mail survey. The questionnaire consisted of three parts. The first part referred to collect demographic factors of the company. The second aimed at investigating the characteristics of the innovative activity carried out by the company. CEOs/owners were asked questions on company's new product development, process innovation, culture as well as networking. Finally, part three concerned the factors affecting innovation of the company.

Quantitative data analysis was aided by statistical package for social science (SPSS version 17). T-test was executed to determine whether any significant differences exist between more or less innovative companies' responses on independent variables. Discriminant analysis is used primarily to identify which factors differentiated the more or less innovative firms. In order to describe the data in terms of frequencies, cross-tabulation analysis was utilized.

4. FINDINGS

4.1 SAMPLE CHARACTERISTICS

Of the 150 questionnaires e-mailed, a total of 48 were responded giving a response rate of 32 percent. Nineteen responses derived from tea manufactures. Thirteen and sixteen replies received from tea exporters and tea manufacture and exporter respectively. Based on innovation measurement criteria scores, there are twenty two companies categorized as less innovative companies and twenty six are categorized as more innovative companies. It is vital to identify which category is more innovative than others. Cross-tabulation analysis (Table 4.1) revealed that companies which engaging both tea manufacturing and exporting are more innovative than other two categories. Tea manufacturing companies recorded less innovativeness among the given categories.

TABLE 4.1: COMPANY* LESS OR MORE INNOVATIVE CROSS-TABULATION

		Less or More Innovative		Total
		Less Innovative	More Innovative	
Company	Tea Manufacturer	13	6	19
	Tea Exporter	6	7	13
	Tea manufacturer and exporter	3	13	16
Total		22	26	48

It is also noted that innovation in tea manufacturers was based more around upgrading the production system where as tea exporters concerned on developing new product innovation.

There are fifty two percent of companies which have less than 25 years of experience and remain have more than twenty five years of experience. Considering the number of executive employees, sixty six percent of companies record less than thirty executive employees and thirty four percent of responded companies have more than 30 executive employees. On the other hand, forty four percent of companies employed less than fifty non-executive employees and remains have more than fifty non-executive employees.

E-mail survey was conducted among chief executives (CEOs)/owners of the randomly selected companies. Most of the responses education background is in sales/marketing background (forty five percent) and second level goes to engineering background (thirty two percent).

4.2 CROSS-TABULATION ANALYSIS

Cross-tabulation analysis was used to describe the data in terms of frequencies and it helps to identify the significant difference exist between more or less innovative companies' responses. Table 4.2 illustrates the results of cross-tabulation analysis.

TABLE 4.2: CROSS-TABULATION ANALYSIS

Criterion	Percentage of Company		Sig.
	Less Innovative	More Innovative	
Corporate Culture			
CEO/Owner has a dream to introduce new product	34	66	0.010
CEO/Owner has a dream to improve production process	44	56	0.410
CEO/Owner has a dream to identify new market	44	56	0.523
CEO/Owner involves in new product development	24	76	0.008
CEO/Owner involves in developing production process	36	54	0.032
CEO/Owner explores a new market	32	68	0.028
CEO/Owner shows a strong commitment to innovation	31	69	0.027
Working Environment			
Company has regular discussion with non-executive employees	27	73	0.001
Company has a suggestion box	31	69	0.006
Company's employees feel free to disagree with management decision	42	58	0.256
Company has new product development team	28	72	0.001
Company uses CAM system	21	79	0.005
Company regularly studies local competitions	49	51	0.058
Company regularly studies foreign competitions	19	81	0.001
Company provides in-house training for employees	48	52	0.452
Company provides outside training for employees	31	69	0.026
Networking			
Refer professional magazines for information	16	84	0.004
Refer internet/social media networks for information	42	58	0.256
Associate with Tea Research Institute	44	56	0.477
Participate tea related conferences	18	82	0.012
Member of any local social club	44	56	0.560
Member of any international association	18	82	0.000
Have collaborative training programmes	37	63	0.014
Refer Tea Market Update	50	50	0.218
Identify that state universities are important information sources for innovation	50	50	0.328
Identify Tea Research Institute as important information source for innovation	35	65	0.031

According to the table 4.2, there are few factors which not satisfied with the required standards (Sig.>0.05). Therefore, those factors dropped from the further analysis.

4.3 DISCRIMINANT ANALYSIS

The study performed a discriminant analysis selecting 'enter independent together'. The descriptive univariate Anova's box M and unstandardized function coefficients are requested.

TABLE 4.3: TESTS OF EQUALITY OF GROUP MEANS

	Wilks' Lambda	F	df1	df2	Sig.
Corporate Culture	.528	13.582	1	46	.005
Working Environment	.648	16.070	1	46	.002
Networking	.593	19.339	1	46	.003

In the table 4.3, the results of univariate Anova's are presented. Here, corporate culture, working environment and networking differ for the two groups (less innovative and more innovative companies).

The following table 4.4 indicates the significance of multivariate normal.

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TABLE 4.4: BOX'S TEST OF EQUALITY OF COVARIANCE MATRICES LOG DETERMINANTS

Less or More Innovative	Rank	Log Determinant
Less Innovative	3	-0.831
More Innovative	3	-1.156
Pooled within-groups	3	-0.855

Test Results

Box's M		5.613
F	Approx.	.753
	df1	6
	df2	16678.124
	Sig.	.648

Tests null hypothesis of equal population covariance matrices.

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

The significance value of 0.648 indicates that the data do not differ significantly from multivariate normal. This means the study can proceed with the analysis. The proportion of variance explained summary of canonical discriminant functions (table 4.5).

TABLE 4.5: SUMMARY OF CANONICAL DISCRIMINANT FUNCTIONS EIGENVALUES

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.731[a]	100.0	100.0	.829

a. First 1 canonical discriminant functions were used in the analysis.

An eigenvalue (0.731) indicates the proportion of variance explained. A large eigenvalue is associated with a strong function. The canonical relation (0.829) is a correlation between the discriminant scores and the levels of the dependent variable. A high correlation indicates a function that discriminantes well. The present correlation in near 1.00 and it is significantly high.

TABLE 4.6: WILKS' LAMBDA

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.601	23.860	3	.000

Wilks' lambda (table 4.6) is the proportion of the total variance in the discriminant scores not explained by differences among groups. A lambda of 1.00 occurs when observed group means are equal (all the variance is explained by factors other than differences between those means), while a small lambda occurs when within-group variability is small compared to the total variability. A small lambda indicates that group means appear to differ. The associated significance value shows whether the difference is significant. Hence, the lambda of 0.601 has a significant value, the group means appear to differ.

The canonical discriminant function coefficients (table 4.7) indicate the standardized scores concerning the independent variables.

TABLE 4.7: CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

	Function
	1
Corporate Culture	1.089
Working Environment	1.072
Networking	1.027

Functions at group centroide (table 4.8) show the average discriminant score for subjects in the two groups. The two scores are equal in absolute value however have opposite sign.

TABLE 4.8: FUNCTIONS AT GROUP CENTROIDS

Less or More Innovative	Function
	1
Less Innovative	.720
More Innovative	-.720

Unstandardized canonical discriminant functions evaluated at group means

The results obtained from the discriminant analysis highlighted that determining factors of more innovative companies are corporate culture, working environment and networking. It should be noted that demographic factors such as; experience, number of employees (executive and non-executive) and education background of CEO/Owner did not show any relationship with company innovativeness.

5.   DISCUSSION AND CONCLUSION

The findings of the study identified three factors; corporate culture, working environment and networking, that contribute to innovative management in Tea firms in Sri Lanka. With regard to the corporate culture, innovation behaviour and commitment of CEO/Owner are high in more innovative companies than less innovative companies. In more innovative companies, CEO/Owner was more involved in developing new product, product process and exploring new markets than less innovative companies. In working environment factor, more innovative companies have product development team than less innovative. Further, more innovative companies provide more opportunities for their employees to reveal their ideas in free comportment. And also, more innovative companies have a better systems and technology in place than less innovative companies. For example, more innovative companies used Computer Aided Manufacture (CAM) system almost three times more than less innovative companies. Results also highlighted that employee's training was more limited in less innovative companies.

With regard to networking, more innovative companies expand their relationship with market entities through research conferences, international organizations and collaborative training programmes than less innovative companies.

The main constraints for innovation of more innovative companies are financial constraint, qualified persons and market accessibility. Whereas for less innovative companies, financial constraint, qualified persons and infrastructure are identified as the main barriers for innovation.

6.   LIMITATION OF THE STUDY

The conceptual model of this study is totally based on three factors and there can be some other factors which play significant role on innovative activities. Yet, the study performed a discriminant analysis selecting enter independent together, therefore it is incapable to differentiate the factors influencing on innovation in terms of tea manufacturing companies and tea exporting companies.

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