A Second Order Confirmatory Factor Analysis Of A Leadership Competency Model: An Empirical Study Conducted In Thailand

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ABSTRACT

In this study, the researchers investigate the contribution of each component of the leadership competency construct through constructing a model incorporating secondary order confirmatory factor analysis and extrapolated to the Kingdom of Thailand. Developed by Eyde et al (1999) in 1998 this leadership competency model is extrapolated to Thailand and examined for fit. Structural equation modeling (SEM) was used to test the research hypotheses framed for this investigation. The findings support the notion that leadership bears a significant relationship with the competencies of leading change, results driven, leading people, building coalitions/communication and business acumen. The good leader should be able to display these competencies as a coherent ensemble. Thus, it can be said that this study provides excellent guidance to human resource managers, teachers, other educators, researchers and managers striving to develop a competitive firm and organization in the current global business environment.

Keywords: Competency; Leadership; Human Resources; Management

INTRODUCTION

At the 12th Association of Southeast Asian Nations (ASEAN) Summit in January 2007, the ASEAN leaders entered into a commitment to hasten the establishment of an ASEAN Community by 2015. As a participant in the ASEAN Economics Community, Thailand will reduce tariffs in 2015 in line with the Cebu Declaration on the Acceleration of the Establishment of an ASEAN Community. As such, there is a new ASEAN spirit of cooperation evident in intra-regional international trade, investment, and liberalization of service sectors. If Thai workers evince levels of skill and competency meeting higher standards, then these workers will have greater latitude and mobility in pursuing employment opportunities. For such eventualities, the country must be prepared in many ways, particularly in fostering the development of human capital. To compete with other ASEAN countries, the fullest feasible development of human capital must become a top priority.

In this study, the researchers investigate the contribution made by each component of a leadership competency model (LCM) applicable to Thailand utilizing second-order confirmatory factor analysis (CFA) Structural Equation Modeling (SEM) was used to test the fit of the proposed model that was based on the 1998 LCM developed by Eyde et al. (1999). In the researchers' view, the results of this study could prove very useful for managers, human resource, teachers, other educators and researchers. It is important to determine what leadership competencies are important for organizations in Thailand and how to foster these competencies through the development of appropriate programs.

LITERATURE REVIEW

The concept of "competency-based human resources" was introduced by McClelland (1973) in his article "Testing for Competence rather than for Intelligence." The factor of competency is a crucial desideratum in the context of accelerating inter-organizational competitiveness obtaining nowadays. This is especially the case when it comes to the proper management of human resources. Organizations strive to enhance competencies as part of organizational human resources management and curriculum development. In studying this process, Eyde, Gregory, Muldrow and Mergen (1999) developed an LCM comprised of twenty-seven competencies as the result of research conducted in 1998.

Organization efficacy has an important role to play in volatile business environments. As such, Bohn (2001) has divided organizational efficacy into three components: a sense of collective capacities, a sense of mission, and a sense of resilience. Moreover, in studying the relationship between leadership and organizational efficacy, Bohn (2002) has applied Bandura's approach.

Bohn has applied a quantitative assessment method showing how the perceptions of leaders can influence perceptions of organizational confidence. Bohn's study involved showing in detail the precise nature of the relationship between leadership perceptions and perceptions of organizational confidence. First, leadership was shown to have a direct relationship with perceptions of organizational efficacy. Leaders influence overall performance throughout organizations. Second, organizational efficacy is related to an understanding of an organization's mission. This kind of understanding is essential to employees as they strive to meet organizational goals. Third, on the other hand, a sense of resilience bears no relationship with leadership. Bohn draws further conclusions from his investigations, including the importance of leadership consistency, communication by leaders, the track records of leaders and the focus of leaders insofar as all of these factors are connected with perceptions of organization efficacy.

Liu and McMurray (2003) have proposed a definition of frontline leadership in the manufacturing industry. In this study, the researchers examined the roles, functions, capabilities, jobs, satisfaction, strengths, weaknesses and skill gaps of frontline team leaders who work in the Australian automobile industry. Liu and McMurray (2003) defined the following frontline leader activities: supporting function and system, leading planning teams and carrying out and improving value added work. The researchers found that a paucity or even absence of rewards and recognition, career opportunities and fair and equitable treatment are the main factors in team leaders evincing dissatisfaction with the work they perform.

Moreover, Tubbs and Schulz (2006) have depicted global leadership competencies in terms of three circles describing the three different aspects of leadership. The first circle (innermost) shows individual core personality. The second circle exhibits individual values. The third circle represents individual leadership behaviors and skills.

Turner (1999) identified seven competencies as associated with the demographical characteristics of effective project managers. These seven competencies are as follows: "problem-solving ability," "results orientation," "energy and initiative," "self-confidence," "perspective," "communication" and "negotiating ability." Furthermore, Belbin (1986) identified nine types of leadership roles, viz., "plant," "team worker," "monitor-evaluator," "implementer," "shaper," "completer-finisher," "coordinator," "specialist" and "resource investigator."

Alldredge and Nilan (2000) have described the development of an executive-level global competency model at the company known as 3M (New York Stock Exchange nomenclature: "MMM," i.e., Minnesota Mining and Manufacturing Company). This competency model consists of twelve competencies as follows: "ethics and integrity," "intellectual capacity," "maturity and judgment," "customer orientation," "developing people," "inspiring others," "business health and results," "global perspective," "vision and strategy," "nurturing innovation," "building alliances" and "organizational agility."

Naquin and Holton (2006) have proposed a management development program. This program consisted of three phases. The first phase is called "competency model development" and involves six steps and commences with an application of the U.S. Office of Personnel Management managerial competency framework. Language is

customized for the local work environment, pilot testing and validation are conducted, alternate versions of the managerial/supervisory survey are developed, new competencies are identified, and other administrative formats are developed. The second phase involves an assessment of training needs. In the third phase, a curriculum is developed. In this phase, there are thirteen steps. The process commences with methodological design and then goes on to determining curricula in consonance with the demographical characteristics of participants, creating a structure for the training program, assembling a curriculum development team, conducting a review of the literature and consulting with recognized content experts, creating a draft of terminal learning objectives, validating terminal learning objectives utilizing key state agency representatives, drafting the proposed content plan, validating terminal learning objectives through a design conference, refinement and revision of curriculum structure, assembling a curriculum committee representing the project team and the state's interests, soliciting input and approval from the curriculum committee, and—at last—finalizing curriculum structure.

The last phase is concerned with design and delivery. This phase consisted of eight steps as follows: determining design and delivery components, developing criterion referenced tests, developing instructional material, having the project team review and approve instructional material, develop pilot courses, develop course delivery strategies, and develop course and performance evaluations.

O'Brien and Robertson (2009) concluded that changing business landscapes require a different set of leadership competencies. The authors identify fifteen core leadership competencies. These fifteen competencies are authenticity, agility, resilience, foresight, self-mastery, "glocalism," intuition, presence and creativity. The authors concluded that older employees lacked competencies in creativity, resilience and glocalism. The other major point is that these competencies are widely accepted in cultures as different as the United Kingdom (UK), the Commonwealth of Australia (Australia) and member countries in the European Union (EU), as well as in Asian countries.

Jokinen (2004) reviewed previous literature on global leadership competency in order to construct a more integrative framework for competency. The author concluded that the core global leadership competencies were self-awareness, engagement in personal transformation, and inquisitiveness. The desired mental demographical characteristic of global leaders consisted of optimism, self-regulation, social judgment skills, empathy, motivation to work in an international environment, cognitive skills and acceptance of complexity and its contradictions. Finally, the behavioral level global leadership competencies consisted of social skills, networking skills and knowledge.

Lipshitz and Nevo (1992) carried out a research investigation designed to provide answers to two questions. The first question was "Who is a good manager?" and the second question is "How can managers become effective?" The authors were accordingly able to distinguish effective and ineffective managers on the basis of manager competences as discussed in a book by Boyatzis (1982). These competences were subsumed under the categories of "efficiency orientation," "proactivity," "diagnostic use of concepts," "concern with impact," "self-confidence," "use of oral presentations," "use of socialized power," "managing group processes" and "accurate self-assessment." Applying the conclusions of an analogous investigation produced by Luthan (1990), Lipshitz and Nevo (1992) were able to answer the second question. The authors found that effective managers should be able to perform these tasks: "Communication," traditional management," "human resource management" and "networking."

Lipshitz and Nevo (1992) thereupon followed the work of Yukl (1990) in which important managerial behaviors were identified through the extrapolation of the managerial practices survey (MPS) technique. The researcher applied factor analyses in the course of developing relevant managerial behavior categories. Yukl (1990) determined that there were eleven categories applicable to managerial behaviors. These eleven categories were "informing," "consulting and delegating," "planning and organizing," "problem solving," "clarifying roles and objectives," "monitoring operations and the environment", "motivating," "recognizing and rewarding," "supporting and mentoring," "managing conflict and team building," and "networking."

CONCEPTUAL MODEL

As already seen above, this research paper is based on the 1998 LCM developed by Eyde et al. (1999). This model involved the largest federal occupational study of managers and executive ever conducted in the USA and is

currently used by the U.S. federal government. The model has been widely used in both the private and public sectors. Eyde, Gregory, Muldrow and Mergen (1999) developed 1998 LCM comprised of twenty-seven competencies. They grouped these competencies into five clusters based on similarities in importance and contents. The first group is labeled "leading change" with eight competencies, viz., vision, external awareness, creativity and innovation, strategic thinking, continual learning, resilience, flexibility and service motivation. The second group is called "business acumen" with three competencies, viz., financial management, human resources management and technology management. The third group is known as "result driven" with six competencies, viz., accountability, problem solving, decisiveness, customer service, entrepreneurship and technical credibility. The fourth group is categorized as "building coalitions/communications" with six competencies, viz., oral communication, written communication, influencing/negotiating, partnering, political savvy and interpersonal skills. The final group falls under the rubric of "leading people" under which are subsumed four competencies, viz., conflict management, leveraging diversity, team building and integrity/honesty.

In developing an LCM, Wang (2006) adapted this model so that it could be extrapolated to the People's Republic of China (PRC). Wang (2006) modified the category "Partnering competency" and it became the new category of "Relationship Management," thereby better fitting the cultural and social environment in the PRC as well as in Thailand. In this light, then, in an attempt to develop a secondary order CFA in applying the LCM, outlines the path taken in Figure 1.

As represented by single-headed lines, the proposed model shows relationship, between leadership, leading change, business acumen, result driven, building coalitions/communications and leading people. This model was translated into a research model that allowed for appropriate measurement and confirmation by covariance data. To examine these results, several hypotheses were framed and variables for the research model were identified. Hypotheses are defined as formulated statements governing the relationships between variables and constructs. Therefore, to examine the relationships between the variables of leadership, leading change, business acumen, result driven, building coalitions/communications and leading people, the following hypotheses were framed in consonance with the research questions and the literature review.

Hypotheses:

H1: Leadership bears a positive relationship with leading change
H2: Leadership bears a positive relationship with business acumen
H3: Leadership bears a positive relationship with result driven
H4: Leadership bears a positive relationship with building coalitions/communications
H5: Leadership bears a positive relationship with leading people

METHODOLOGY

Structural equation modeling (SEM) involves testing for both construct validity and the theoretical relationships obtaining between individual constructs belonging to a set of concepts represented by multiple measured variables. SEM can be used to examine a series of dependence relationships simultaneously. SEM is useful in testing theories that contain multiple equations involving dependence relationships. The measure of fit must reflect the overall model, not just single relationships. SEM uses a series of measures that depict how well a theory can explain the observed covariance matrix among measured variables. There are many kinds of indices that can be used in applying measurements to a specific model. Unsuchote (2009) and Hair (2006) suggested the following criteria for measuring structural equation model validity as follows:

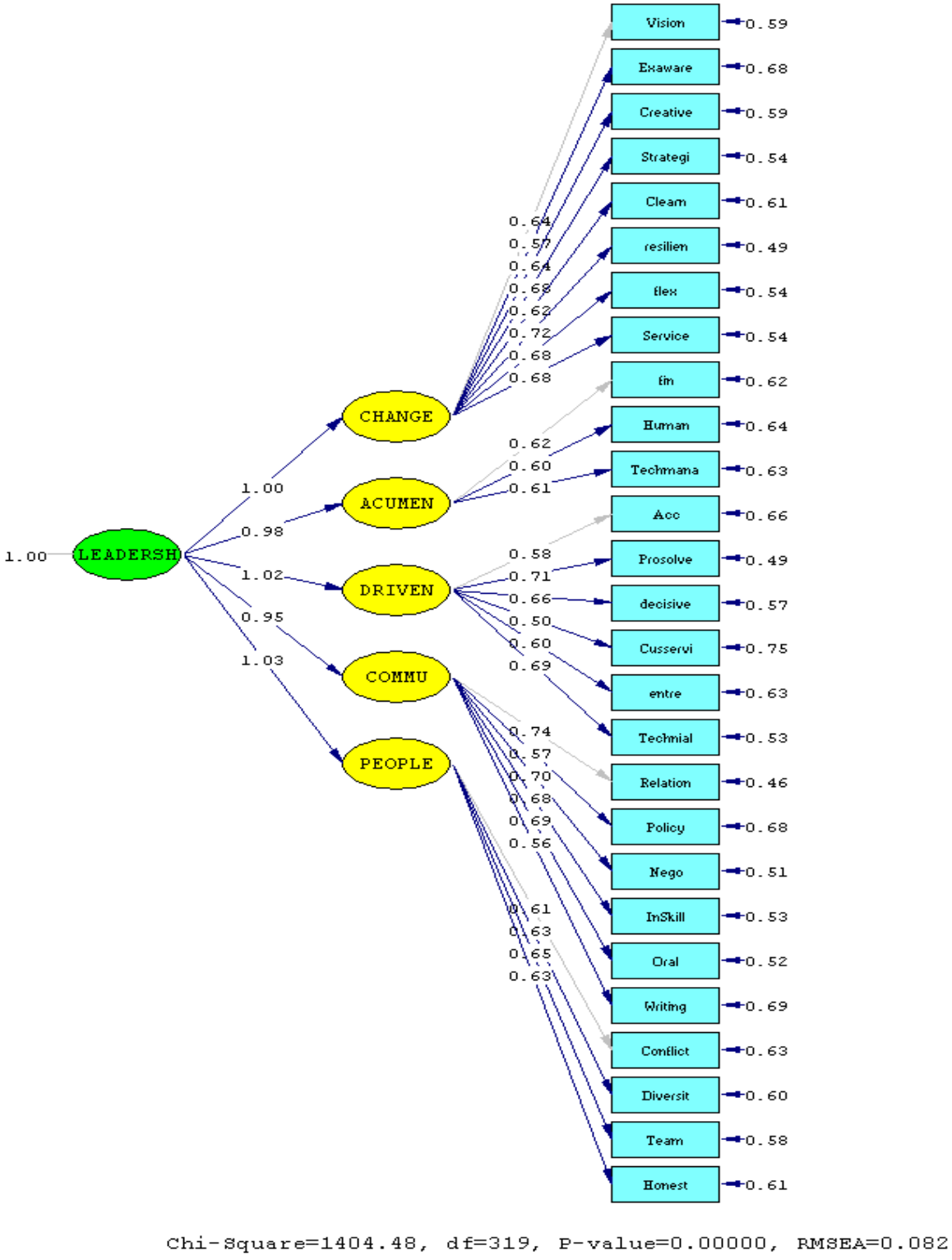

Figure 1. Secondary Order Confirmatory Factor Analysis (CFA) Applied to the Development of a Leadership Competency Model (LCM) for Thailand

1. The results of chi-square ($\chi 2$) testing should be statistically insignificant
2. The relative/normal chi-square/degrees of freedom ($\chi 2$/df) ratio should be less than 2 (<2)
3. The root mean square of approximation (RMSEA) and standardized root mean square residual (RMRP) should have values less than .05 (<.05)
4. The absolute values of the largest and smallest standardized root mean square residual (RMRP) should be less than 2 (<2)
5. The normed fit index (NFI), the non-normed fit index (NNFI), the comparative fit index (CFI), the incremental fit index (IFI), the relative fit index (RFI), the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI) should have values greater than 0.9 (>0.9)
6. The parsimony normal fit index (PNFI) and the parsimony goodness of fit index (PGFI) should have values greater than 0.5 (>0.5)
7. The estimated non-centrality parameter (NCP) should have a value close to 0 ($\varepsilon \rightarrow 0$)
8. The values of the expected cross-validation index (ECVI) should be less than the ECVI for the saturated model and the ECVI for the independence model
9. The values of the model asymptotic information criterion (AIC) should be less than those for the saturated AIC and the independent AIC models
10. The values of the model consistent Akaike information criteria (CAIC) should be less than those for the saturated CAIC and independent CAIC models
11. The critical number (CN) should be greater than 200 (>200)

DATA COLLECTION

In carrying out this research inquiry, Ramkhamhaeng University graduate students in business administration were recruited to participate in a survey investigation. A total of 800 male and female students enrolled in the graduate business administration programs were recruited. Primary data were gathered by means of an empirical survey-based research methodology allowing the testing of the research hypotheses. On the basis of a total sample population of eight hundred respondents, 63.9 percent of student respondents completed the questionnaire (N=511). Almost three-fourths were females (71.6 percent). The majority of the respondents were between the ages of twenty-six and forty (69.5 percent). The number and percentage of responses from participants in each organizational ownership group show that two hundred fifty-two respondents (49.5 percent) were from private companies, fourteen respondents (2.7 percent) were from multinational companies, eighty-three respondents (16.2 percent) were from government/non-profit organizations, sixty-six respondents (12.9 percent) were from state-owned companies, thirty-four respondents (6.7 percent) were owners of businesses, twenty-five respondents (4.9 percent) were full time MBA students and thirty-seven respondents (7.3 percent) were employed in other types of organizations.

RESULTS

The technique of confirmatory factor analysis (CFA) was used to provide a confirmatory test of the measurement scales applied to the constructs labeled as leading change, business acumen, result driven, building coalitions/communication and leading people. The hypothesized measurement model as extrapolated to the constructs of leading change, business acumen, result driven, building coalitions/communication and leading people consisted of eight observed variables, three observed variables, six observed variables and four observed variables, respectively. The measurement model was assessed by validating the degree of overall model fit.

Table 1: Comparison of the Fit Indices for Leading Change, Business Acumen, Result Driven, Building Coalitions/Communication and Leading People on the Basis of Confirmatory Factor Analysis (CFA)

Statistic	Leading Change	Result Driven	Building Coalition/ Communication	Leading People	Fitness Guideline Values
	Insignificant	Significant	Insignificant	Insignificant	Insignificant
X2/df	1.28	2.00	1.59	2.78	< 2
RMSEA	.023	.044	.034	.059	< .05
Standardized RMR	.02	.025	.019	.02	< .05

Largest and smallest standardized residual	3.02	3.34	2.40	2.23	< 2
GFI	0.99	0.99	0.99	1	> 0.9
AGFI	0.98	0.97	0.98	0.99	> 0.9
PNFI	0.60	0.59	0.46	0.97	> 0.5
NCP	4.75	9.01	4.14	3.56	$\varepsilon \rightarrow 0$ (close to 0)
Critical N (CN)	785.28	612.56	846.41	859.86	> 200

As a result of having developed a satisfactory measurement model, the second order CFA model could be tested. The purpose of evaluating the second order CFA model was to determine whether the theoretical relationships specified are supported by the relevant empirical data. The relationships between the measurement of structural relationship and the constructs were evaluated on the basis of the definitions of the constructs.

The initial model was modified on the basis of the modifications of the indices that were suggested by the linear structural relations (LISREL) outputs. Each modification involved the addition of an additional path as suggested by the modification indices. The X2/df ratio and the RMSEA were computed for each case in order to evaluate whether modifications were justified. On the basis of applying the modified model, the results obtained are found in Table 2 infra.

Table 2 : The Fit Indices of the Initial and Modifying second order CFA Model

Statistic	**The second order CFA Model**		**Fit Guideline**
	Initial	Modify	
The chi-square test	Significant	Insignificant	Insignificant
chi-square/degree of freedom	4.403	1.155	< 2
RMSEA	0.082	0.017	< 0.05
Standardized RMR	0.052	0.027	< 0.05
Largest and smallest standardize residual	0.015	3.57	< 2
GFI	0.83	0.96	> 0.9
AGFI	0.80	0.94	> 0.9
PNFI	0.87	0.66	> 0.5
NCP	1085.48	36.49	close to 0
Critical *N* (CN)	157.39	544.99	> 200

The modified second order CFA model was found to be the preferred model, with all fit statistics indicated in the fit guidelines with the exception that the largest and smallest standardized residual were greater than the suggested values. The X2 test was insignificant. The largest and smallest standardized residual was 3.57. The other indices indicated the good fit of the second order CFA model. The X2/df ratio was 1.155. RMSEA was 0.017 and Standardized RMR was 0.027. GFI was 0.96 and AGFI was 0.94. Critical N was greater than 200. The conclusion to be drawn in respect to modification is that the overall fit of the second order CFA model evinced good fit results.

In this section, findings concerning the testing of hypotheses are presented and conclusions are discussed. For testing the hypotheses in this study, LISREL was used as a program as the statistical software for SEM. The results of hypothesis testing are shown in Table 3 infra.

Hypothesis 1: Leadership bears a positive relationship with leading change

Leadership was found to have a significant positive influence on leading change. When the respondents perceived that they had attained a higher level of leadership, they tended to evince a concomitant higher level of leading change. Hypothesis 1 was supported (t=15.83**) with the standardized coefficient being 1.02.

Hypothesis 2: Leadership bore a positive relationship with business acumen

Leadership was found to have a significant positive influence on business acumen. When the respondents perceived that they had attained a higher level of leadership, they tended to exhibit a corresponding higher level of business acumen. Hypothesis 2 was supported (t=13.42**) with the standardized coefficient being 0.94.

Hypothesis 3: Leadership bore a positive relationship with result driven

Leadership was found to have a significant positive influence on result driven. When the respondents perceived that they had attained a higher level of leadership, they tended to manifest as well a higher level of result driven. Hypothesis 3 was supported (t =12.94**) with the standardized coefficient being 1.01.

Hypothesis 4: Leadership bore a positive relationship with building coalitions/communications

Leadership was found to have a significant positive influence on building coalitions /communications. When the respondents perceived that they had attained a higher level of Leadership, they tended to show a correspondingly higher level of building coalitions/communications. Hypothesis 4 was supported (t =18.07**) with the standardized coefficient being 0.99.

Hypothesis 5: Leadership bore a positive relationship with leading people

Leadership was found to bear a significant positive influence on leading people. When the respondents perceived that they had attained a higher level of leadership, they tended to exhibit a concomitant higher level of leading people. Hypothesis 5 was supported (t = 14.88**) with the standardized coefficient being 1.01.

The significant findings on the basis of hypothesis testing are as follows:

The standard coefficient and t-value showing significance at the 0.01 level is quite high for a test such as this. Moreover leading change is usually considered the most significant variable for leadership competency (standard loading of leading change = 1.02) followed by result driven and leading people (standard loading of result driven and leading people = 1.01), building coalitions/communications (standard loading of building coalitions/communications = 0.99) and business acumen (standard loading of business acumen = 0.94). However, the standard loading ranged between 0.94 and 1.02, thereby indicating that good leadership must exhibit strength in every competency and not just in a single competency. This result show that the good leader should be able to display competency in leading change, result driven, leading people, building coalitions/communication and business acumen simultaneously. Moreover, all indices in testing this model have a strong significance level at 0.01, as shown in Table 3 infra.

Table 3 : Result of Hypothesis Testing of the Second Order CFA Model

Hypothesis	Path	Std.	t-Value	Result
H1	Leadership bears a positive relationship with leading change	1.02	15.83**	Supported
H2	Leadership bears a positive relationship with business acumen	0.94	13.42**	Supported
H3	Leadership bears a positive relationship with result driven	1.01	12.94**	Supported
H4	Leadership bears a positive relationship with building coalitions /communications	0.99	18.07**	Supported
H5	Leadership bears a positive relationship with leading people	1.01	14.88**	Supported

*indicates significance at the .05 level.
**indicates significance at the .01 level.

This study presents a new model that allowing human resource professional and managers to plan and implement short term and long term strategies, analyze how to allocate their budgets or limit resources allocations in a proper vein conducive to human resource development. This could be helpful when a company is desirous of understanding the structure of leadership competency and, accordingly, to develop a strong competency development program.

CONCLUSION

This research investigation lays a foundation for extending inquiry into other areas of leadership competency. In addition, this study provides a different way of examining leadership competency in the course of which is shown the significance of the second order CFA model. The researchers found that leadership bears a significant relationship with leading change, result driven, leading people, building coalitions/communication and business acumen competencies. In the view of the researchers, therefore, this study can provide superior guidance to managers, human resource managers, teachers, other educators and researchers who now have a unique guide whereby they can fully grasp the importance of the LCM presented by the researcher.

AUTHOR INFORMATION

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APPENDIX

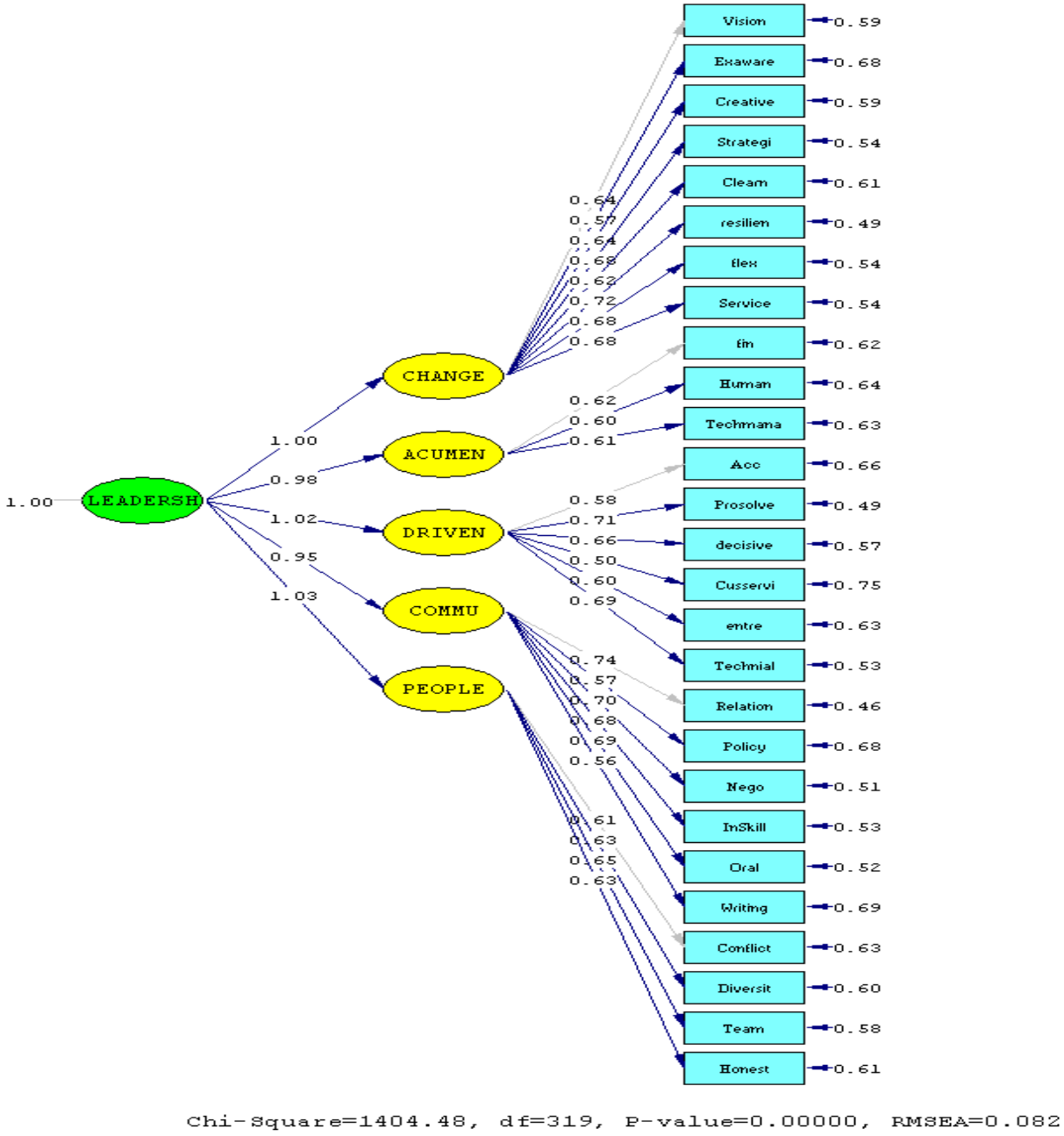

Figure 2 Standardized loading of path diagram

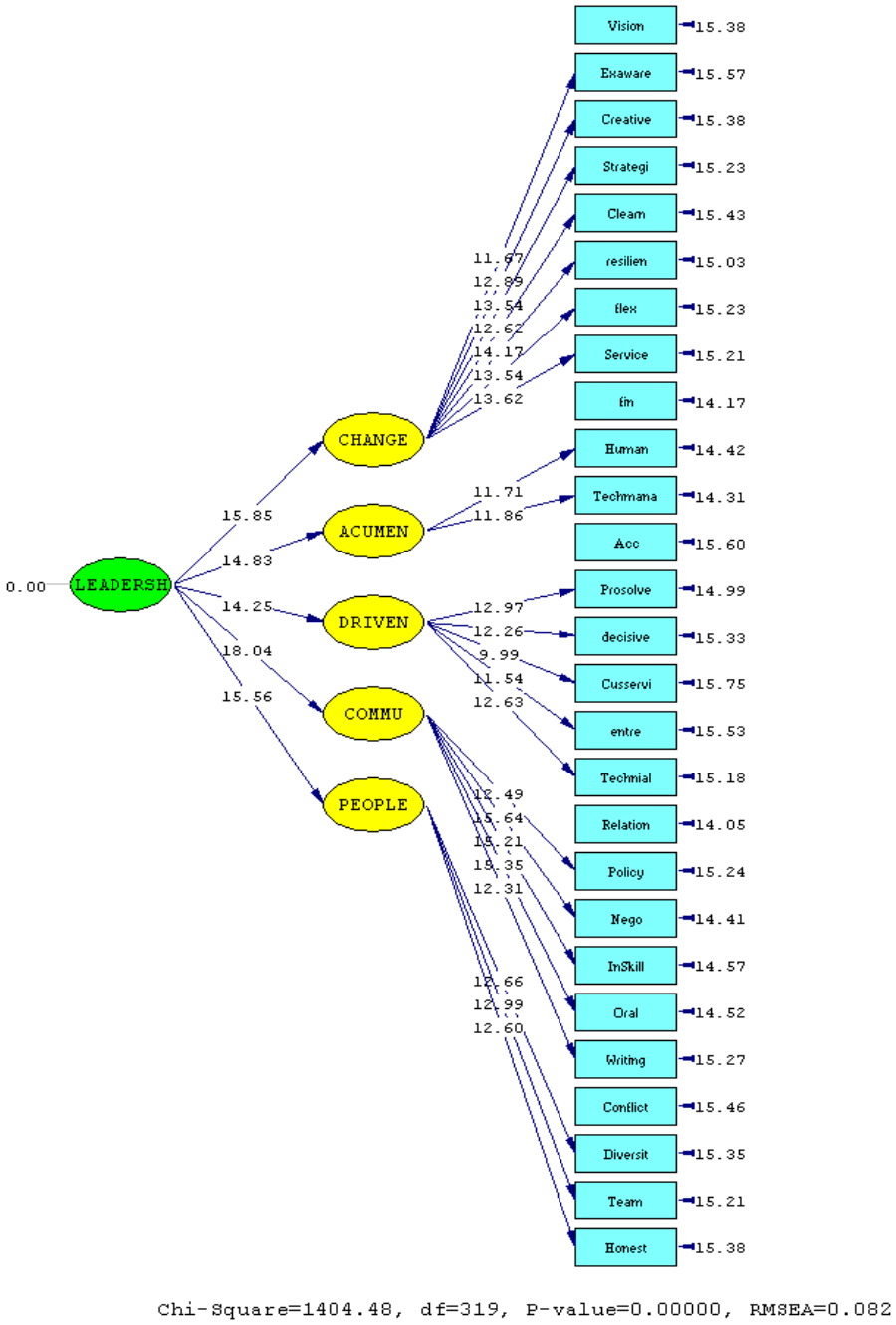

Figure 3: Result of *t* value path diagram