

The Role of Lean Thinking in Enhancing Entrepreneurship Orientation of the Academic Organisation: An Experimental Study of the Al-Dewaniyah Technical Institute

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The present study attempts to highlight the role of Lean Thinking and investing in it as a development strategy to Enhance the Entrepreneurship Orientation of the academic organisation as a philosophy based on maximizing the delivered value of the customer to enable the organisation to achieve a competitive position for on the path to success and sustainability. In order to achieve the objectives of the study, a questionnaire of 30 items was devised and administered. The sample included 60 academics from different departments of the organisation. According to the purpose of the study, two main hypotheses and the use of a set of statistical methods were formulated through the statistical software spss vr.24. The research reached a set of relevant conclusions and relevant recommendations.

Key words: *Lean Thinking, Entrepreneurship Orientation, Innovativeness, Proactiveness, Risk-taking.*

Introduction

Amidst the circumstances of contemporary organisations and the rapid changes in a highly complex and creative business environment, there has been a need to implement methods, programs and practices to meet these immediate and potential challenges. Lean Thinking was the most prominent of these methods as the backbone of the application of Lean systems,

including the movement to expand the efforts of continuous improvement and flexible operations and the good use of personnel and resources available to reduce costs and serve customers beyond the physical limits of the organisation. This requires the commitment and participation of all employees in the management of the transition to use this method and tools instead of continuing in the traditional methods and devote the idea of adapting to unexpected variables and take effective position decisions to guarantees the success and continuity of the organisation.

This study draws its importance from tackling a modern topic that has aroused the interest of researchers and those interested in management and strategic thinking in order to conduct further studies and research or provide insights that contribute to the success and institutional excellence. In addition, this study is an attempt to draw attention to the adoption of this philosophy as a successful business strategy. The research adopts the questionnaire method mainly in the collection of data and information related to the applied aspect. The study is divided into four sections: the first section reviews the methodology of the study. The second section sheds light on the theoretical framework with its two variables to establish a knowledge basis to be used in the fieldwork. The third section deals with the statistical aspect. The study concludes with the fourth section on the conclusion and the relevant recommendations.

Section One: Methodology

A. Study Problem

The problem of the study consists of the following questions:

1. What is the level of Lean Thinking practices in the sampled organisation?
2. To what extent does Lean Thinking influence Enhancing the Entrepreneurship Orientation of the academic organisation?
3. What is the nature of the relationship between Lean Thinking and entrepreneurial orientation in the sampled organisation?

Therefore, the problem of the study is focused on the role that Lean Thinking plays in Enhancing the entrepreneurial orientation in the academic organisation.

B- Study Importance

This study draws its importance from the fact that it deals with a dynamic subject in trying to upgrade the academic organisation, strengthen its position and gain a distinct market share to excel. In addition, this study is (Madsen, 2007):

1. A step to enrich thought in identifying the reality and level of Lean Thinking and its role in fostering entrepreneurial orientation in the sampled organisation.
2. An attempt to draw attention to the need to adopt Lean Thinking as an entrepreneurship strategy.
3. An Enrichment to the scarcity of relevant research in a topic of modern interest.

C-Study Objectives

The objectives of the study are summarised as follows:

1. Highlighting the concept of Lean Thinking as a strategy for success and Entrepreneurship.
2. Examining the role played by Lean Thinking in attaining Entrepreneurship.
3. Seeking to know the level and reality of Lean Thinking in the sampled organisation.
4. Detecting the level of entrepreneurship orientation of the sampled organisation.
5. Studying and analysing the relationship between Lean Thinking and entrepreneurial orientation in the sampled organisation.

D-Study Hypothesis

The study is based on the following two hypotheses:

1. There is a statistically significant correlation between the independent variable (Lean Thinking) and the dependent variable (Entrepreneurship orientation).
2. There is a statistically significant effect between the independent variable (Lean Thinking) and the dependent variable (Entrepreneurship orientation).

E-Data and Information Collection Methods

1. Theoretical aspect: adopting sources, references and related literature to find out the scientific background of the study.
2. Practical aspect: adopting exploratory approach by adopting a questionnaire for this purpose to collect data and information.

F-Study Limitations

1. Scientific Limits: The study is limited to the Role of Lean Thinking in Enhancing Entrepreneurship Orientation.
2. Human limits: Teachers in the sampled organisation with its various departments.

G-Study Community Society and Sample

The technical institute in Diwaniyah was selected to apply the study for its vital role in supplying the work sectors in Iraq with his renewable technical capabilities with high efficiency. The sample of the study was the teaching staff of the organisation from all disciplines. Sixty copies of the questionnaire were distributed to the teachers, their queries were listened to and the relevant aspects of the study were clarified. All questionnaire copies were restored from the sample and response rate was 100%.

H-Research Gap

This study deals with the concept of Lean Thinking, which is characterised by modernity, in terms of its interest and focus on the level and reality of application in the Technical Institute in Diwaniyah province as an academic organisation. This aspect has been overlooked in previous studies.

I- Statistical Methods

The study was based on the following statistical methods: Arithmetic mean, Standard deviation, Coefficient of variation, Relative importance, Analysis of the confirmation factor, Correlation analysis, Regression analysis, T-test, F-test, Alpha-Kronbach coefficient.

Section Two: Theoretical Framework

First: Lean Thinking (LTH): Conceptual and Epistemological Foundations

1. The Concept of Lean Thinking: The Japanese intellectualism introduced many management systems and philosophies that contributed to the improvement of organisational performance. Lean Thinking is of interest to many researchers, although it is a product of modernity.

(Bhasin & Bucher,2006) defined Lean Thinking as improving the reliability and quality of an organisation's operations, reducing waiting time and releasing important resources to support the organisation's growth and competitiveness and the ability to exploit opportunities.

(Czabke,2007) argues that it is a way of thinking that increases the organisation's resilience to environmental requirements in a way that leads to better product delivery and lower cost compared to other organisations.

(Swafford, *etal.*,2008) showed that it is a successful way of thinking to compete with the rules of speed, innovation, flexibility, quality, productivity and profitability in the light of resource integration. (Bonaccorsi, *etal.*,2011) saw it as a management philosophy to improve

the perceived value of the customer by adding significant value to the good and/or service and excluding activities that do not add value from operations. (Ahakchi, *etal.*,2012) pointed out that it is a theory of increasing efficiency, creating a constant value and minimising costs and waste.

(Deshpande,2012) argued that it is a methodology for achieving value-added manufacturing excellence and continued waste reduction using lead production techniques and principles that improve the efficiency of value-added activities. (Render,2012) added that it is a philosophy and set of practices originally developed at Toyota to eliminate waste, also known as Lean manufacturing or Lean enterprise. (Al-Yasari,2018) indicated that it is a philosophy or methodology aimed at maximising the value provided to the consumer by reducing waste and achieving significant improvements in quality, cost and time by focusing on improving processes.

Based on the above, Lean Thinking is a business philosophy and strategy based on transformation from a traditional to lean organisation that involves flexible processes aimed at reducing waste, improving process, and making good use of available resources by workers because it is a meaningful socio-technical system.

Background

In 1990, the Americans researchers (James P. Womack & Daniel T. Jenex) derived the most important and necessary principles in the Toyota production system and created a new production philosophy called Lean Production in the book “The Machine that Changed the World”. In 1996, their book “Lean Thinking”, which introduced the philosophy of the Five Lean Principles, was a key to achieving Lean Thinking. These principles set the customer as the centre of every activity to ensure that the good or service provides value to the customer. The book presents concepts of lead production that can extend beyond the limits of production to include all work such as marketing, finance and accounting. These concepts can also be used in the service sector (Schroeder,2007). (Georgscu,2011). (www.cardiff.ac.uk.) (McLeod, 2009).

Although this philosophy originated from a range of operational ground *floor* technologies, it has advanced significantly in new fields (manufacturing systems). The reason behind this shift is evident by identifying and eliminating waste and adopting lean principles not only to improve performance and reduce costs but to improve customer acceptance and business profitability as well. Lean Thinking requires a profound change in the operational mindset that is always inconsistent with the traditional state of mind. There is no doubt that office work is very variable with multiple tasks and individuals who need to be creative (Bonaccorsi, *etal.*,2011). Lean Thinking is therefore a concept based on Toyota's production

system to expand continuous improvement efforts to reduce costs and serve customers beyond the physical boundaries of the manufacturing organisation including processors, distributors and production system that supports the manufacturing function (Iran & Zhon,2004). It is used to achieve the following: (Mireles, Sandra, www.ehow.com)

1. Eliminating waste: anything that doesn't add value.
2. Enabling workers to get feedback.
3. Delivery of products to customers early not late, and this does not mean non-conforming production, but means to provide the best value products in the shortest possible time without compromising the value of the product.
4. Improving the value chain and employing skilled workers to perform multiple functions. This keeps the workflow constant when the worker is not present.
5. Enhancing employee loyalty and assuring them that their value is from the organisation.

Principles of Lean Thinking

(Al-Samman,2008). (Mcloed,2009) and (Dabbagh,2017) indicate that the principles of Lean Thinking are: the determination of value, the flow of value, the flow of production, the withdrawal of production, the pursuit of perfection. According to (Visser,2009). it lies in respect for individuals, building mutual trust, eliminating or reducing waste, and orderly and continuous improvement of production processes (Al-Sayir, 2017).

Objectives of Lean Thinking

This research maintains that Lean Thinking aims in its final vision to continuously improve the operations of the organisation to achieve better performance with better outputs, while completely eliminating any activity that does not add value to the end product from the customer's point of view. In general, Lean Thinking aims to reduce overproduction, excess storage, unnecessary movement, excessive processing, unnecessary transport, defective outputs, reduce waiting time, reduce employee misuse, invest their knowledge and creative ideas and engage them in the decision-making process.

Requirements of Lean Thinking

In order to implement the lean initiative, the following must be available: (Wilson, 2010)

1. High levels of stability and quality in operation and product.
2. Availability of excellent machines.
3. Solutions to the problem of talent with a deep understanding of contrast.
4. Philosophy of continuous improvement is mature.

5. Fixed standard techniques.

The researcher adds that understanding the fundamental foundations, in-depth study of lean, identifying, monitoring and changing non-lean areas of the organisation is an important requirement for lean in the organisation's operations, as well as multi-skilled personnel and an appropriate strategy to identify and implement the changes needed for improvement.

Second: Entrepreneur Orientation (Eo)

The Concept of Entrepreneurship

Entrepreneurship is an important and promising field in the economies of developed and developing industrial countries. Pilot projects actively contribute to the development of inclusive economic development in all countries (Al-Najjar & Al-Ali,2006). (Richard & Barnet,2004) defined entrepreneurship as a process in which individuals or groups seek opportunities to create value through a series of actions or behaviours to ensure the creation of a new entrepreneurial project and contribute to its success.

(Ferrell,*etal.*,2008) argued that entrepreneurship is the process of creating and managing business to achieve desired goals. On this basis, the research sees that Entrepreneurship is the process of creating the opportunity to create something of value and take the risk associated with it (Irani and Zhou, 2004).

The Concept of Entrepreneurship Orientation

(Dess,*etal.*,2007) indicated that entrepreneurial orientation is targeted practice for formulating the organisation's strategy of excellence and starting new projects. (Tang,*etal.*,2009) argued that entrepreneurship is the organisation's desire to adopt proactive and creative behaviours and take calculated risks in an attempt to create and exploit environmental opportunities. (Fairoz,*etal.*,2010) argued that an entrepreneurial approach is a strategy of senior management charged with proactive, creative and risk-taking.

(Todorovic,2011) argued that entrepreneurial orientation is an organisation-wide characteristics that represents a perspective on Entrepreneurship and Innovativeness reflected throughout the organisation's processes and culture. (Rasheed & Al-Ziadi,2013) pointed out that the entrepreneurial orientation reflects the organisation's tendency to adopt new ideas and transform them into new products, processes, systems or procedures, and to be prepared to take risks associated with them, as well as being proactive in knowing the changes in the external environment in order to create value for the organisation and its customers.

(Al-Hadrawi & Al-Kalabi,2013) believed that entrepreneurship orientation is a strategy that drives organisations to achieve competitive advantages based on creativity, risk taking and initiative to enter new markets, acquire opportunities and meet the needs and desires of customers. On this basis, the entrepreneurial orientation is a strategic position that stems from a comprehensive management philosophy and an intellectual approach adopted by the organisation to predict the future and focus on creating new opportunities in its external environment and investing them through a range of proactive activities in order to achieve desirable outputs (Schroder, 2007).

Dimensions of Entrepreneurship Orientation

Through research into the literature of entrepreneurship, the authors and researchers addressed the entrepreneurial approach as a multidimensional phenomenon. Some of them presented three dimensions (Miller and Friesen, 1983) and later, (Covin & Slevin,1989) represented in Innovativeness, Proactiveness and Risk-taking are the core dimensions of entrepreneurial orientation (Najjar,2012). Others added two more dimensions: competitive offensive and autonomy. However, there is some agreement among them on the following three dimensions:

1. Innovativeness (In): It defines the organisation's orientation towards innovation and abandonment of traditional practices through innovation and experimentation with new products, services or processes or improvement of technological processes (Dess,*etal.*,2007).
2. Proactiveness (Pro): It means the organisation's efforts to seize new opportunities (Mohammed,2012).
3. Risk-taking (Rt): means understanding the uncertainty and potential negative consequences (Madesn,2007).

Importance of Entrepreneurship Orientation

The importance of the entrepreneurship orientation lies in that:

1. Represents policies and practices that enable the organisation to adjust its entrepreneurship positions towards new business opportunities (Engelen,*etal.*,2012).
2. Creative work in an ambiguity environment (Chen & Hus,2013) because it provides the organisation's core capacity to build advantage by representing the organisation's tendencies to adopt unfamiliar behaviours to anticipate future changes in the external environment, willingness and desire to make investments with uncertain results (Brouthers,*etal.*,2014).

3. Its essence is the strategic position of the organisation in becoming more willing to innovate and embrace new ideas (Wales,*etal.*,2013).
4. Contributing to stimulate and activate the spirit of entrepreneurship for organisations wishing to participate, which is reflected in their ongoing operations and structure that paves the way for entry into new markets (Al-Sayer, 2017).

Objectives of Entrepreneurship Orientation

The objectives can be summarised in the following three aspects: (Abdullah, *et al.* 2018)

1. Increasing the value and utilisation of resources through significant overlap between the human and resource components of organisations, because the new opportunity is based on technology determined by the technical knowledge and experience of skilled personnel (Dess,*etal.*,2007).
2. Exploiting an attractive and economically appropriate entrepreneurial opportunity that creates value for beneficiaries or users endeavors by seeking resources and abilities to exploit this opportunity. Therefore, organisations should be interested in monitoring opportunities wherever and whenever the opportunity exists. Any new project with a starting point is an entrepreneurial opportunity (Dess,*etal.*,2008).
3. Creating and developing individuals characterised by successful entrepreneurial thinking and challenging traditional traditions. The traditional concept achieves its status because it represents the status quo (Carpenter & Sander,2009).

Section 3: Statistical Analysis

The collected research data include a sample of 60 respondents, who each received a copy of the research questionnaire. Then, such data were categorised and processed by SPSS v.24 software to be analysed. The repetitive responses were excluded and the means and standard deviations were found for each item in the questionnaire along with correlations and coefficients of the study variables (Mohamed, 2012).

Validity and Consistency

The questionnaire validity and consistency were measured by Alpha-Cronbach coefficient, the value of which is affixed in the following table, which denotes that the questionnaire is valid and consistent.

Table 1: Alpha-Cronbach value

Axis	Items	Alpha Cronbach
LTh	15	0.95
EoIn	5	0.91
EoPro	5	0.85
EoRt	5	0.90
Eo	15	0.94
Total	30	0.97

Frequencies and General Statistics

The following table shows the general statistic values represented by frequencies, means and standard deviation for each questionnaire item.

Table 2: General Statistics for Questionnaire Items

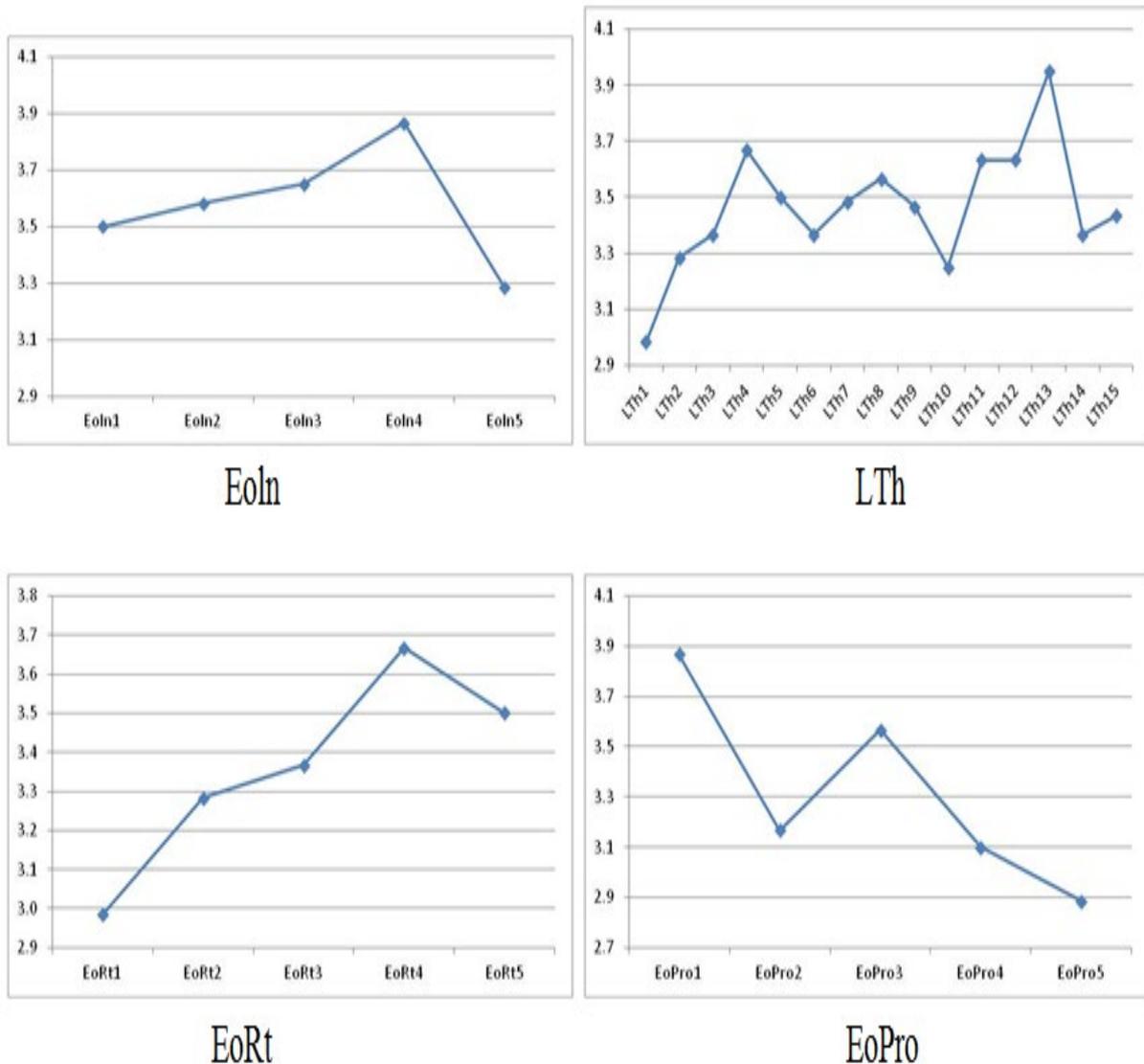
Dimension or axis	Frequency & Percent	Do not Completely agree	Do not agree	Agree to some extent	Agree	Completely agree	Arithmetic mean	Standard deviation	Dimension or axis	Do not Completely agree	Do not agree	Agree to some extent	agree	Completely agree	Arithmetic mean	Standard deviation
LTh1	Frequency	12	11	11	18	8	2.98	1.359	EoIn1	3	15	10	13	19	3.50	1.308
	Percent	20.0	18.3	18.3	30.0	13.3				5.0	25.0	16.7	21.7	31.7		
LTh2	Frequency	9	9	8	24	10	3.28	1.329	EoIn2	3	15	7	14	21	3.58	1.331
	Percent	15.0	15.0	13.3	40.0	16.7				5.0	25.0	11.7	23.3	35.0		
LTh3	Frequency	4	12	10	26	8	3.37	1.149	EoIn3	2	13	6	22	17	3.65	1.205
	Percent	6.7	20.0	16.7	43.3	13.3				3.3	21.7	10.0	36.7	28.3		
LTh4	Frequency	4	10	2	30	14	3.67	1.203	EoIn4	3	7	7	21	22	3.87	1.186
	Percent	6.7	16.7	3.3	50.0	23.3				5.0	11.7	11.7	35.0	36.7		
LTh5	Frequency	4	10	7	30	9	3.50	1.142	EoIn5	4	12	15	21	8	3.28	1.136
	Percent	6.7	16.7	11.7	50.0	15.0				6.7	20.0	25.0	35.0	13.3		
LTh6	Frequency	6	11	6	29	8	3.37	1.221	EoIn	15	62	45	91	87	3.58	1.057
	Percent	10.0	18.3	10.0	48.3	13.3				5.0	20.7	15.0	30.3	29.0		
LTh7	Frequency	4	10	10	25	11	3.48	1.172	EoPro1	1	10	2	30	17	3.87	1.065
	Percent	6.7	16.7	16.7	41.7	18.3				1.7	16.7	3.3	50.0	28.3		
LTh8	Frequency	3	12	7	24	14	3.57	1.198	EoPro2	4	17	10	23	6	3.17	1.152
	Percent	5.0	20.0	11.7	40.0	23.3				6.7	28.3	16.7	38.3	10.0		
LTh9	Frequency	3	11	9	29	8	3.47	1.096	EoPro3	1	13	9	25	12	3.57	1.095
	Percent	5.0	18.3	15.0	48.3	13.3				1.7	21.7	15.0	41.7	20.0		
LTh10	Frequency	3	17	8	26	6	3.25	1.129	EoPro4	9	13	11	17	10	3.10	1.337
	Percent	5.0	28.3	13.3	43.3	10.0				15.0	21.7	18.3	28.3	16.7		
LTh11	Frequency	1	9	13	25	12	3.63	1.025	EoPro5	12	15	10	14	9	2.88	1.379
	Percent	1.7	15.0	21.7	41.7	20.0				20.0	25.0	16.7	23.3	15.0		
LTh12	Frequency	3	8	8	30	11	3.63	1.089	EoPro	27	68	42	109	54	3.32	0.963
	Percent	5.0	13.3	13.3	50.0	18.3				9.0	22.7	14.0	36.3	18.0		
LTh13	Frequency	3	5	1	34	17	3.95	1.048	EoRt1	12	11	11	18	8	2.98	1.359
	Percent	5.0	8.3	1.7	56.7	28.3				20.0	18.3	18.3	30.0	13.3		
LTh14	Frequency	4	10	14	24	8	3.37	1.119	EoRt2	9	9	8	24	10	3.28	1.329
	Percent	6.7	16.7	23.3	40.0	13.3				15.0	15.0	13.3	40.0	16.7		
LTh15	Frequency	6	8	13	20	13	3.43	1.254	EoRt3	4	12	10	26	8	3.37	1.149



	Percent	10.0	13.3	21.7	33.3	21.7				6.7	20.0	16.7	43.3	13.3		
LTh	Frequency	69	153	127	394	157	3.46	0.911	EoRt4	4	10	2	30	14	3.67	1.203
	Percent	7.7	17.0	14.1	43.8	17.4				6.7	16.7	3.3	50.0	23.3		
	Frequency								EoRt5	4	10	7	30	9	3.50	1.142
	Percent									6.7	16.7	11.7	50.0	15.0		
	Frequency								EoRt	33	52	38	128	49	3.36	1.044
	Percent									11.0	17.3	12.7	42.7	16.3		

The responses tend to agree on the items, which is proved by the frequency of the responses in the table above. The following figures show the means for the questionnaire dimensions.

Figure 1. Means of questionnaire items



Confirmation Factor Analysis for the Questionnaire Topics

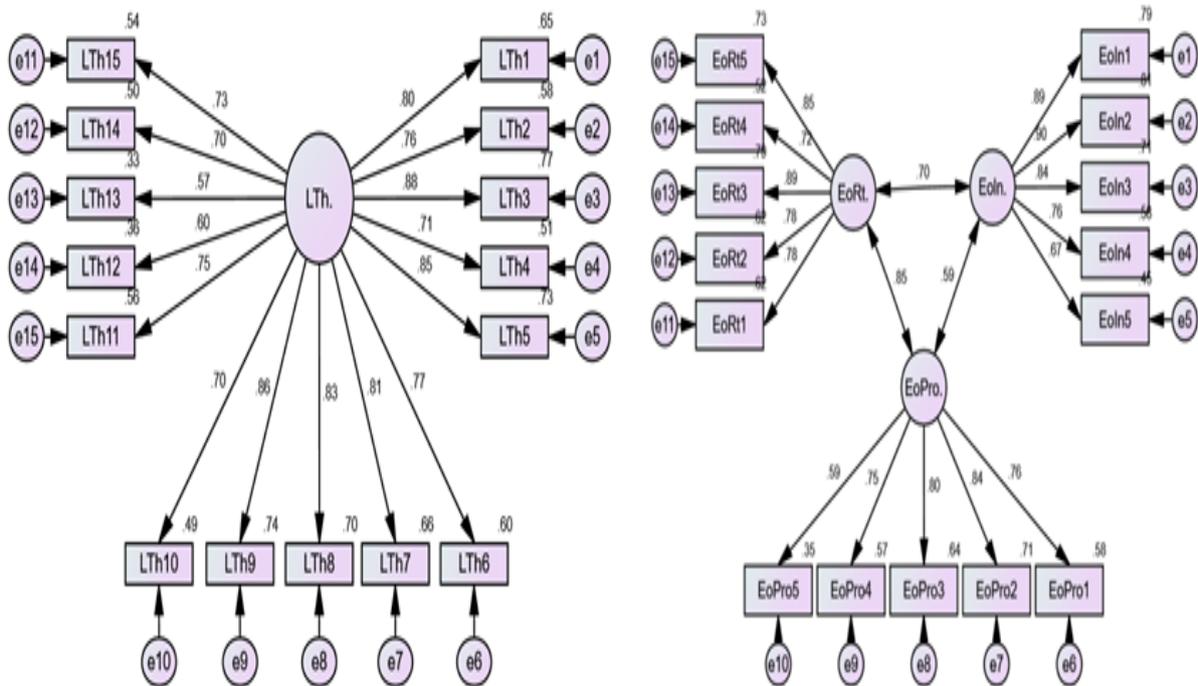
A typical structural diagram can be formed to analyse the questionnaire items through a general analysis of regression weights and measuring the model accuracy by the relevant criteria. Chi square value has also been used along with comparative fit index (CFI), root mean square error of approximation (RMSEA) and Tucker-Lewis index (TLI) as the following table shows:

Table 3: Criteria and decision made to accept/reject the models

Parameter	Lean Thinking (LTh)			Entrepreneurship Orientation (EO)		
	Parameter Value	Comparison	Decision	Parameter Value	Comparison	Decision
X ² / df	290.214/87 =3.34	Less than 5	Accepted	253.206/90 =2.81	Less than 5	Accepted
CFI	0.84	More than 0.50	Accepted	0.89	More than 0.50	Accepted
TLI	0.80	More than 0.50	Accepted	0.85	More than 0.50	Accepted
RMSEA	0.00	Less than 0.08	Accepted	0.00	Less than 0.08	Accepted

The structural diagram for the questionnaire topics formed by AMOS software, is shown in the following figure:

Figure 2. Structural diagram



The regressive weights point out that there is a variation explanation among the dimensions and topics in the questionnaire. Therefore, these weights contribute to explaining such topics and dimensions each according to its regressive value as in the following table:

Table 4: Regressive weights of questionnaire items

Item	EoRt5	EoRt4	EoRt3	EoRt2	EoRt1	EoPro5	EoPro4	EoPro3	EoPro2	EoPro1	EoIn5	EoIn4	EoIn3	EoIn2	EoIn1
Estimate	0.855	0.719	0.887	0.785	0.785	0.591	0.753	0.8	0.842	0.764	0.67	0.761	0.844	0.9	0.889
Item	LTh15	LTh14	LTh13	LTh12	LTh11	LTh10	LTh9	LTh8	LTh7	LTh6	LTh5	LTh4	LTh3	LTh2	LTh1
Estimate	0.735	0.705	0.574	0.604	0.749	0.701	0.861	0.834	0.814	0.774	0.852	0.714	0.88	0.764	0.804

Correlations and their Significance

Here, the correlation values and their significance between the two study topics will be found and the significance of these correlations will be tested by formulating the null hypothesis that “there is no significant correlation between the two topics of the study under 5%” versus the alternative hypothesis which says “there is a significant correlation under 5%.” Thus, the research found the values of correlations as in the following table:

Table 5: Correlations

Correlations		EoIn	EoPro	EoRt	Eo
LTh	Pearson Correlation	.697**	.833**	.960**	.941**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	60	60	60	60

** . Correlation is significant at the 0.01 level (2-tailed).

The above results include the correlation value between the LTh and the Eo as well as the correlation values between LTh and the three Eo dimensions. As the results indicate the rejection of the null hypothesis and the acceptance of the alternative hypothesis, we conclude that there is a direct and significant correlation between the LTh and the Eo below 5%, as the correlation value between them was 0.941.

We also conclude that there is a direct and significant correlation between the LTh and EoIn dimension below 5% as the value of the correlation between them reached 0.697, and there is a direct and significant correlation between LTh and the EoPro dimension under 5% as the correlation value between them was 0.833, and the presence of a direct and significant correlation between LTh and EoRt dimension is below the 5% significance level, as the correlation value between them was 0.960.

Effect of LTh on EO

The study here considers the effect of LTh on Eo and its three dimensions (EoIn, EoPro, EoRt) to show its significance and strength. as the main null hypothesis for this effect is as follows:

H0: no significant effect of LTh on EO

Versus the alternative hypothesis:

H1: there is a significant effect for LTh on Eo.

and the null sub-hypothesis for the effect of LTh on Eo dimensions:

H0: there is no significant effect for LTh on Eo dimensions

versus the alternative hypothesis:

H1: there is a significant effect for LTh on Eo dimensions.

The following table shows the results:

Table 6: Results of impact analysis

Independent variable	Coefficient	F- Test	F-Test Significance	Effect Parameter	T- Test	T-Test Significance
Eo	%89	450.21	.000	.94	21.218	.000
EoIn	%49	54.903	.000	.70	7.410	.000
EoPro	%70	131.947	.000	.83	11.487	.000
EoRt	%92	688.187	.000	.96	26.233	.000

Obviously, there is a direct and significant effect of the LTh on the Eo. The value of the identification coefficient indicates that the model used is able to explain differences with 89% efficiency. As for the value of the f-test (450.21). it is significantly below 5% significance. The value of the impact parameter was 0.94 and its t-test is 21.218, being a value of significance below 5%, this means that there is a significant direct effect and therefore we conclude that the increase of LTh by one unit leads to an increase in the value of Eo by 0.94. Likewise, there is a direct and significant effect of LTh on EoIn dimension, as the value of identification coefficient indicates that the model used is able to explain the differences by 49% efficiency. The value of the f-test is 54.903, and this value is significant under 5% significance. The value of the impact parameter is 0.70 and its t-test is 7.410, being a value of significance below 5%. This means that there is a significant direct effect and therefore we conclude that the increase of LTh by one unit leads to an increase in the value of EoIn by 0.70.

There is a direct and significant effect of LTh on EoPro dimension, as the parameter value indicates that the model used is able to explain the differences by 70% efficiency. The value of the f-test is 131.947, and this value is significant under the 5%. The value of the impact parameter is 0.83 and its t-test is 11.487, which is a significant value 5%. This means that there is a significant direct effect and therefore we conclude that the increase of LTh by one unit leads to an increase in the value of EoPro by 0.83.

Also, there is a direct and significant effect of LTh on EoRt dimension, as the value of identification coefficient indicates that the model used is able to explain the differences by 92% efficiency. The value of the f-test is 688.187, and this value is significant 5%. The value of the impact parameter is 0.96 and its t-test is 26.233, which is a significant value below 5%. This means that there is a significant direct effect and therefore we conclude that the increase of LTh by one unit leads to an increase in the value of EoRt by 0.96.

Therefore, the following can be said:

1. The questionnaire is valid and consistent.
2. The responses tend to agree with the items.
3. The items can measure the variables and dimensions and explain them according to their regressive values.
4. There is a significant positive correlation between LTh and Eo and its dimensions below 5%.

Section 4: Conclusion and Recommendations

Conclusion

- a. The increase of LTh by one unit leads to an increase in the value of Eo by 0.94.
- b. The increase of LTh by one unit leads to an increase in the value of EoLn by 0.70.
- c. The increase of LTh by one unit leads to an increase in the value of EoPro by 0.83.
- d. The increase of LTh by one unit leads to an increase in the value of EoRt by 0.96.
- e. The strongest impact of LTh on Eo is on EoRt, then on EoPro and finally on EoLn.
- f. The responses of the sample reflected a positive trend in the importance of research in the topic of Lean Thinking as a business philosophy and strategy based on the transformation from a traditional organisation to a lean organisation.
- g. The responses of the sample reflected that they were highly convinced by the importance of research on Lean Thinking as a purposeful methodology to achieve improvements and maximize the value provided to the beneficiary.
- h. The interest of the researched organisation to work to support and adopt Lean Thinking as a successful business philosophy to perpetuate its leadership by creating appropriate requirements and conditions.

- i. The researched organisation is working to monitor all changes that occur in the external environment and what is emerging from it as it is one of the main engines for the sources of opportunities and threats facing it.

Recommendations

- a. The necessity of creating a stimulating scientific environment and a more suitable working climate for creativity, innovation and encouragement to present new creative ideas and adopt methods that enable the organisation to achieve a distinguished position.
- b. Working to establish partnership relations with the corresponding scientifically distinguished academic organisations with the aim of exchanging knowledge, familiarising themselves with their programs, transferring their accumulated experiences, and benefiting from their experiences to enhance their entrepreneurial orientation.
- c. Promoting proactive work in the organisation by identifying the desires and needs of its students and other stakeholders and responding quickly to it before other organisations.
- d. Sustaining the organisation's sending an informational message to its staff on the most important advantages that can be achieved through adopting Lean Thinking.
- e. The need for the organisation to rely on a set of incentive programs that would strengthen its staff to follow-up and monitor developments in both its internal and external environment.
- f. Adopting strategies to attract customers, such as opening effective scientific departments that interest them.
- g. Working hard to establish the entrepreneurship orientation of the organisation and adopt an intellectual strategy that pushes its staff to adopt an entrepreneurial spirit that adopts innovativeness, proactiveness and risk-taking to ensure outstanding performance and continuous growth.
- h. Continuing to create the desire for change among employees, developing an entrepreneurial spirit and taking responsibility, and involving them in the decision-making process adequately and hearing their proposals, allows for creativity to enhance the elements of success in a way that contributes to better development and increases ability for development and renewal and to keep the pace with the developments of the century.

REFERENCES

- Abdullah, H. A., Abdullah, A. M. and Salih, Z. M. (2018). Inclusions Of Entrepreneurial Orientations Philosophy In The State Company For Drugs Industry And Medical Appliances In Samarra, Al-Rafidein Development magazine, vol. 37, issue 119.
- Ahakchi, R., Ahakchi, R., Yangih, B. S. and Alilou, M. (2012). Lean Accounting Adaptation tool Lean Thinking and lean production, world Applied Sciences Journal 17 (8) , pp: 1040- 1045
- Al-Dabbagh, E. N. K. (2017). Influence of organisational lean on high performance. M.A. thesis, Faculty of Administration and Economic, Baghdad University, Iraq.
- Al-Hadrawi, H. K. and Al-Kilabi, A. N. M. (2013). the role of entrepreneurship orientation in customer perception of service quality, Al-Qadisiyah journal of Administrative and Economic Sciences, vol.15, issue 1, Iraq.
- Al-Najjar, F. and Al-Ali, A.-S. (2006). entrepreneurship and small businesses, Dar Al-Hamed, Jordan.
- Al-Najjar, H. A.-A. (2012). effect of adopting ISO26000 on achieving entrepreneurship orientation, M.A. thesis, Faculty of Administration and Economic, Karbala University, Iraq.
- Al-Samman, T.A. S. (2008). Integration between effective manufacturing strategies and Lean manufacturing methods and their impact on enhancing operational performance, Ph.D. thesis, Faculty of Administration and Economic, University of Mosul, Iraq.
- Al-Sayir, O.Y.M. (2017). The relationship between entrepreneurship orientation and market orientation and their effect on competitive advantage, Journal of Baghdad College for Overall Economic Sciences, issue 21, Iraq.
- Al-Yasari, S. H. F. (2018). analysing Lean Thinking competences in Babil sanitation directorate, Faculty of Administration and Economic, university of Al-Qadisiyah, Iraq.
- Bhasin, S. & Burcher, P. (2006). "Lean viewed as philosophy", Journal of Manufacturing Technology Management, Vol. 17, No.1.
- Bonaccorsi, A., Carmignani, G. and Zammori, F. (2011). Service value stream management (SVSM) Developing Lean Thinking in the service industry, Journal of service science and management, Vol.13, No.4, PP. 428 – 439.



- Brouthers, K. D., Nakos, G. and Dimitratos, P. (2014). "SME Entrepreneurial Orientation, International Performance, and the Moderating Role of Strategic Alliances", Baylor University.
- Carpenter, M. A. and Sanders, G. W. (2009) "Strategic Management: dynamic perspective concepts", 2nd ed, Prentice-Hall.
- Chen, H. L. & Hsu, C. – H. (2013). " Entrepreneurial orientation and firm performance in non-profit service organisations: contingent effect of market orientation", The Service Industries Journal ,Vol 33, No 5, PP 445.446, Rout ledge.
- Czabke, jochen, (2007). Lean Thinking in the secondary wood product industry: challenges and benefits ",master thesis and engineering department, Oregon state University
- Deshpande, V.S. (2012). Lean Manufacturing and Productivity Improvement in Goal "Mining, Manor Ade ital." international Journal of Engineering science and Technology (IJEST) , Vol. 4, No. 5 .
- Dess, G. G., Lumpkin, G.T. and Eisner, A. B. (2007). "Strategic Management: Creating competitive Advantage", 3th edition, McGraw-Hill.
- Dess, G. G., Lumpkin, G.T. and Eisner, A. B. (2008). "strategic management, text&cases"4th edition, McGraw-Hill.
- Engelen, A., Gupta, V., Stranger, L. & Brette, M. (2012). "Entrepreneurial Orientation, Firm Performance, and the Moderating Role of Transformational Leadership Behaviors, Journal of Management, Reprints and permission.
- Fairoz, F.M., Hirobumi,T. and Tanaka,Y. (2010). "Entrepreneurial orientation and business performance of small and medium scale enterprises of Hambantota District Sri Lanka. Asian So Science,Vol.6, No.3.
- Ferrell, O.C., Hirt, G. e .offrey, and Ferrell, L. (2008)."Business", 6ed,McGraw-Hill
- Georgescu, D. D. (2011). Lean Thinking and transferring Lean Management– The Best Defense against an Economic Recession? , The polytechnic university of Bucharest , Vol.3 , Issue. 1.
- Irani, S. A. & Zhou, J. (2004). value stream mapping of a complete product , The ohio state university , Columbus.



- Madsen, E.L. (2007). "The significance of sustained entrepreneurial orientation on performance of firms- A longitudinal analysis", Rutledge, Taylor & Francis group, Entrepreneurship & Regional Development, (19).
- McLeod, A. (2009). " Conceptual development of an introductory Lean manufacturing Course for freshmen and sophomore level student in industrial technology, the technology interface Journal / fall, Purdue university .
- Miller, D. and Friesen, P.H. (1983) Strategy-Making and Environment: The Third Link, Strategic Management Journal, Vol. 4, No. 3.
- Mireles, S. How to use Lean Thinking, [www. ehow. Com](http://www.ehow.com) .
- Mohamed, O. M. (2012). the role of the management in building entrepreneurial leadership, M.A. thesis, Faculty of Administration and Economic, Slaimaniyah University, Iraq.
- Rasheed, S. A.-R. and Al-Zayadi, S. H. S. (2013). the role of entrepreneurship orientation in achieving excellent university performance, Al-Qadisiyah journal of Administrative and Economic Sciences, vol. 15, issue 2, Iraq.
- Render, B. (2012). The Encyclopedia of operations Management, A field Manual and Glossary of Operations Management, Terms and Concept, Al- Thru V. Hill.
- Richard, O. & Barnet, T. (2004). Cultural diversity in management firm performance, and the moderating role of entrepreneurial orientation dimensions, Academy of Management Journal, Vol. 47, No. 2 .
- Schroder, R. G. (2007). " Operations Management Contemporary Concepts and Cases " , 3rd Ed , McGraw – Hill, New York .
- Swafford, P.M. Gosh, S. & Murthy, N. (2008). "Achieving supply chain agility through IT integration and flexibility", International Journal Production economics, Vol. 116, No. 2.
- Tang, K.P.M., Marion, L., Dickson, P., & Weaver, K.M. (2009). A "hierarchical perspective of the dimension of Entrepreneurial Orientation, International Entrepreneurial Management Journal,5:181-201.
- Todorovic, Z.W., McNaughton, R.B., & Guild, P. (2011). ENTER-UA, "Entrepreneurial Orientation scale for universities" Tec novation ,31:128-137.
- Visser, B. (2009)."Lean principles in case management", master thesis Redbud universities Nijmegen, Netherlands.



Wales, W. J., Parida, V. & Patel, P.C. (2013)." Research Notes and Comment Aries Too Much of a good thing? Absorptive capacity, firm Performance and The moderating role of entrepreneurial orientation, Start. Mgmt. J., 34.

Wilson, L. (2010). How to implement lean manufacturing, McGraw– Hill, New York.

WWW.Cardiff.ac.uk.