

The role of lean manufacturing (Toyota model) in entrepreneurship for organisations/an analytical study of the opinions of a sample of workers at the Arab Integration Factory in Al-Muthanna Governorate

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Abstract

The current research sought to identify the role of lean manufacturing in entrepreneurship for medium and small-sized organizations, clarify the intellectual relationship between the two variables, and test the relationship of correlation and effect between them in the field.

The problem of the research was to find solutions for medium and small-sized organizations to face competitive challenges, and to obtain a market position so that they can survive and grow in a very complex, dynamic environment, by answering the main question of the research, which is what is the relationship of correlation and effect between the variable of lean manufacturing as an independent variable and the variable entrepreneurship as a dependent variable? The practical aspect of the research was applied in the Arab Integration Factory for the production and packaging of tomato paste. The researcher adopted the descriptive analysis approach in answering the research questions, as the sample was randomly selected from the individuals working in the factory, and the questionnaire was distributed electronically to (159) working individuals. The answer was given by only (150) respondents, and these are the questionnaires that were used for statistical analysis. The researcher used descriptive statistics, Pearson correlation, and (SEM). The research reached a set of conclusions, the most important of which is the existence of a statistically significant correlation and effect between lean manufacturing and entrepreneurship for organizations. In light of the conclusions, the researcher presented a set of recommendations, the most important of which was that the factory management should adopt the concept of lean manufacturing in all its dimensions and apply it in a clear and understandable way. For all working individuals, efforts towards achieving this are supported by the senior management.

Keywords: Lean Manufacturing, Entrepreneurship, Toyota Manufacturing System

The Introduction

Entrepreneurship is one of the important research concepts for today's organizations, especially small and medium-sized organizations, because due to intense competition and environmental fluctuations and the accompanying opportunities and threats, organizations are forced to adopt the concept of entrepreneurship in order to obtain a competitive advantage that helps them grow compete and find a place for themselves and their products in the markets local. It was mentioned (Glinyanova et al, 2021:1731) researchers have shown an increasing interest in better understanding the effectiveness of organizational entrepreneurship over the past fifty years, and the large number of publications has made organizational entrepreneurship a broad and complex research field. Based on the above, the problem of the current research is to find means and methods for medium and small-sized organizations that contribute to strengthening their presence in global markets and ensuring their continuity and growth, by answering the main research question (knowing the role of lean manufacturing according to the Toyota model in promoting entrepreneurship for organizations), and from this The question raises a number of sub-questions, which are:

1. What is the level of availability of lean manufacturing dimensions in the researched organization?
2. What is the level of availability of entrepreneurship dimensions in the researched organization?
3. What is the correlation and effect between lean manufacturing in entrepreneurship?

The research aims to identify the correlation and effect between lean manufacturing and entrepreneurship for the organization under study The Arab Integration Factory for producing and bottling tomato paste in Muthanna Governorate was chosen for the field aspect of the current research, and the size of the total community reached (270) individuals working in the factory, and based on what was mentioned by (Krejcie & Morgan, 1970, 608), the size of the research sample was (159) working individuals. The researcher distributed the questionnaire electronically via the Google Forum platform to the respondents, because this platform allows the researcher to ensure the answer to all items, and the answer was given by (150) respondents only, which is the sample that was dealt with in the statistical analyses.

Research hypotheses

The researcher assumes two main hypotheses:

Correlation hypothesis (there is a statistically significant correlation between lean manufacturing and entrepreneurship)

Effect hypothesis (there is a statistically significant effect of lean manufacturing on entrepreneurship).

Theoretical Background

Theoretical Background

First/1. The concept of lean manufacturing

The Japanese automobile company, Toyota, established the Lean Manufacturing (LM) system, which has been adopted by most industrial organizations around the world due to the almost certain benefits it brings in improving quality, reducing cost, flexibility, and rapid response (Palange & Dhattrak, 2021, : 729), and it was mentioned (Alefari et al, 2017:756) The concept of lean manufacturing began in the late 1980s, and nowadays the term lean manufacturing can be found almost everywhere, just to give a few examples: lean services, lean entrepreneurship, lean software development, and product development Lean, lean accounting, lean manufacturing organizations, the list goes on and on and although the basic concept is the same; Maximizing customer value with minimal waste, i.e. “manufacture/deliver more with less cost” The researchers (Chahal & Narwal, 2017,322) defined the lean manufacturing system as the elimination of waste in the production system that may be associated with working individuals, and inventory Time in the various stages of production is an effective and common tool in most manufacturing and service sectors for treating non-valuable activities and waste. (Buer et al, 2018:2924) stated that it can be said that lean manufacturing is the most prominent manufacturing model in recent times, as it supports industrialization. Lean manufacturing companies are in their efforts to improve in many areas, including reducing production costs, improving quality, and improving responsiveness by reducing lead times and increasing flexibility. He added (Schonberger, 2019: 359) The main goal of lean manufacturing should be to serve customers with a faster, more flexible, high-quality response - all in a customer attraction mode. Inventory reduction is an important contributor to services as well as goods. On the other hand, he wrote (Durakovic et al, 2018:130) Even if lean manufacturing helps many organizations reduce waste and thus improve many dimensions of performance, many organizations still struggle to successfully transform their organizations into lean manufacturing organizations, as most organizations fail to take into account strategic fit. Lean practices try to implement them in environments where they cannot be applied, while other organizations find that the basic methods of lean manufacturing are not sufficient and therefore do not meet the operational requirements of their organizations. According to (Wyrwicka & Mrugalska, 2017:780), the concept of lean manufacturing enables entrepreneurs to develop and improve their market position. However, organizations may often tend not to adapt to it, not only during the implementation of the concept, but also later, neglecting to act in accordance with the assumptions of the adopted philosophy. Perhaps it is important to mention that adopting the concept of lean manufacturing requires large financial expenditures in some cases to apply it systematically and obtain the desired results from it. Therefore, it is necessary for organizations that adopt this concept to allocate time and effort in addition to financial support for successful implementation.

.2Lean manufacturing according to the Toyota model (TPS)

The Toyota Lean Manufacturing Production System (Lean-TPS) provides many tools such as 5S, Kanban, and value flow mapping, but nevertheless, through many attempts to apply Lean-TPS, The administrative and organizational cultural dimension has emerged, and as a result, the lean production that has been introduced in global organizations differs from the original TPS, in which developing the skills of

individuals working in problem solving, their participation, teamwork, and respect for individuals are considered essential elements (Chiarini et al, 2018:428). According to (Taherimashhadi & Ribas, 2018:207) Lean manufacturing does not deal only with the production process, but is considered an interconnected system of soft and hard practices that are affirmed by a set of beliefs and values. Hard practices refer to technical tools while soft practices relate to the individuals working, which are equally important to achieving Outperforming, many organizations focus on deploying tools only without considering less obvious areas including cultural aspects. He mentioned (Dave, 2020:1600) The Toyota Production System (TPS) was proposing a system to obtain maximum economic efficiency with minimum resources. The key to TPS is to eliminate any type of waste, any activity that does not add value to the product: overproduction, inventory, transportation, waiting time, Storage space, maintenance/errors, and display time by assigning this responsibility to workers in the production area. According to (Paladugu & Grau, 2020:561), the theoretical basis of the TPS system is based on five main pillars: organizational behaviors to eliminate waste (Muda), continuous improvement (Kaizen), and supporting decision-making to stop production by working individuals (autonomy) (Jidoka), just-in-time (JIT) manufacturing, and standardization, and Figure (1) shows the foundations of this system

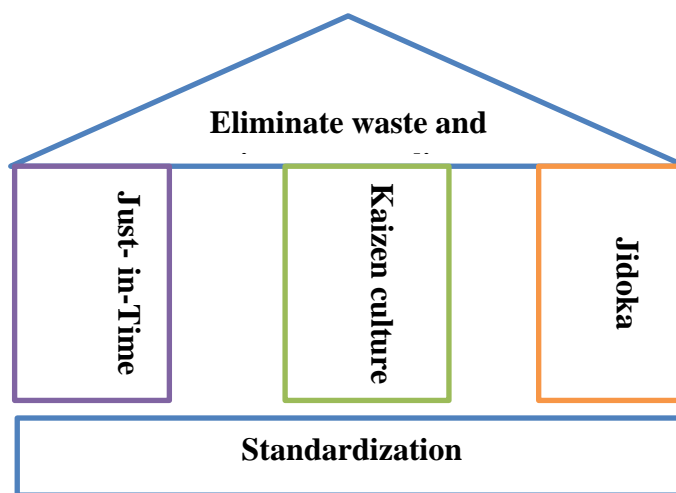


Figure (1) Toyota production system

Source: Paladugu, B. S., & Grau, D. (2020). Toyota production system-monitoring construction work progress with lean principles. In *Encyclopedia of Renewable and Sustainable Materials*. Elsevier, 1(5),560-565.

It was mentioned (Loyd et al, 2020:1443) The most important aspect of the Toyota production system is respect for working individuals. The combination of the TPS system and the culture of respect for individuals is crucial to the success of implementing lean manufacturing according to Toyota, as the culture of respect for individuals represents the cultural standard under which TPS thrives, where the culture is The cornerstone of the original TPS house, indicating that the pillar of Toyota's culture is what holds the three technical components of TPS (standardization, just-in-time manufacturing, and embedded quality) together to enable the successful implementation and performance of the Lean Manufacturing concept.

Second/ 1. The concept of entrepreneurship

Entrepreneurship in businesses refers to entrepreneurial activities such as innovation, adventure, and strategic renewal within established companies. The concept of entrepreneurship in businesses dates back to the mid-1970s, initially presented as a strategic model and leadership adopted by large companies to cope with increasing market disruptions.(Sakhdari, 2016:5). Mentioned (Kuratko, 2017: 442) Entrepreneurship in organizations (CE) is a term used to describe entrepreneurial behavior within existing small, medium, and large enterprises. Other common or related terms include organizational entrepreneurship, intrapreneurship, institutional entrepreneurship, and strategic entrepreneurship. It has become a strategy. Key in all types of organizations. According to (Kuratko & Morris, 2018:44) The concept of entrepreneurship is applied to organizations that either create new projects within existing organizations or transform existing organizations through strategic renewal and an orientation towards entrepreneurship. Waked (Tseng &

Tseng, 2019:110) History has proven time and again that organizations must be able to innovate, change, and transform quickly to meet rapidly changing market expectations. To adapt quickly, organizations need to enhance their innovation prowess, and companies need to tap into the creative power of their employees. This supports the trend of most global organizations toward Entrepreneurship. According to (Martín-Rojas et al, 2020:396) Corporate entrepreneurship is the process that occurs within an existing company, regardless of its size, and leads to new business ventures and other innovative activities such as the development of new products, services, technologies, management techniques, competitive strategies, and even new business models. It is considered entrepreneurship. Business in companies is a behavior or strategic stance through which individuals within organizations undertake new activities.

The concept of entrepreneurship is a concept that depends mainly on exploiting opportunities and building economic value for the organization by relying on its internal resources of individuals or groups, creating new businesses, developing current products to suit the orientation of customers, or creating new products or new markets. All of this is considered opportunities and areas that the organization can search for. And the risk of exploiting it (Glinyanova et al, 2021:1733). According to (Urbano et al, 2022:1543) Entrepreneurship is the ways in which companies create new businesses that generate new sources of revenue and value for shareholders. It is the process through which an individual or group of individuals, in cooperation with an existing organization, creates a new organization or instigates innovation or innovation within that organization. Added (Kuratko et al, 2023:133) Organizations that exhibit entrepreneurship are typically viewed as dynamic and flexible entities ready to take advantage of new business opportunities as they arise. Entrepreneurship in organizations is conceptualized as embodying entrepreneurial efforts that require organizational sanctions and resource commitments for the purpose of implementing innovative activities in the form of product and process innovations. And organizational. The main motivation for organizations to move towards entrepreneurship is creativity, innovation, and supporting individuals working in the organization who possess such mental talents, developing these talents and benefiting from them in order to develop ideas and find innovative solutions to organizational problems.

2.The importance of entrepreneurship

In organizations Operating in a constantly changing environment, therefore, the competitive advantage of companies is affected by the technological, social, political, economic, legal and global environmental conditions. Creating a new product and technology is crucial to many organizations. This requires creativity from the perspective of entrepreneurship. Innovative performance is a crucial element in forming competitive advantages. Organizations must develop an entrepreneurial strategy for organizations in order to grow and expand the business (Enginoğlu & Arikan, 2016:15). According to (Kuratko et al, 2017:274), the importance of entrepreneurship for organizations lies in recognizing opportunities and exploiting them to achieve success. It also enables organizations to facilitate continuous adaptation to dynamic competitive environments through the internal orientation of entrepreneurship, which is based on entrepreneurship in organizations. Added (Yunis et al, 2018:344) Entrepreneurship helps organizations increase revenues, improve profitability, enhance competitiveness, and increase reliance on information and communications technology to achieve and maintain competitiveness and success in today's dynamic market and thus obtain better efficiency and higher performance. According to (Salamzadeh et al,2019:279) Entrepreneurship contributes to the renewal of existing organizations and helps them to develop and improve businesses, increase income and profitability, and become leaders in producing and developing new products, services and processes. It is a survival strategy for organizations that operate in highly competitive business environments.

3.Dimensions of entrepreneurship for organizations

Male(Yiu & Bruton,2007:529-530) Three dimensions of entrepreneurship for organizations that will be adopted in the current research are (innovation, organizational adventure, and strategic renewal). Innovation is everywhere today as organizations include the term innovation in their vision, mission, and objective statements. The position of chief innovation officer is becoming more common, and innovation centers are also appearing in universities (Kahn, 2018:453). Added (Lee & Trimi, 2018:1) Global executives emphasize the importance of continuous innovation for new products/services and projects for customers the purpose of innovation is much deeper than simply creating greater value for customers, a better competitive advantage for organizations, and an environment to improve the quality of life the ultimate goal of innovation must be

to create a better future. As for organizational adventure, it was mentioned (Mckelvie et al, 2018:24) The ability to gain external market knowledge, or knowledge of customers' wants, needs and processes, is essential. To reduce risks and facilitate the exploration of markets and opportunities, and even the opportunity to make a leap by imitating successful competitors and venturing into new, unconventional fields for the sake of organizational success and achieving goals. As he wrote (Lerner & Nanda, 2020:238) Organizational adventure is necessary to explore and engage in opportunities because success depends on the extent of adventure and risk in order to achieve profits organizations must seek adventure while reducing risks as much as possible organizational adventure depends on the nature of the organization and the type of that adventure it may be entering new markets or offering innovative new products or unconventional organizational means. Regarding strategic renewal, according to (Schmitt et al, 2018:81) It is the process by which organizations change course by transforming their strategic intentions and capabilities. Recognizing, formulating, and implementing these transformation processes are central and important issues for the organization since most organizations need to transform themselves at one time or another, strategic renewal is a key consideration in understanding their survival. and its prosperity in the long term. Added (Järvi & Khoreva, 2020:77) Phenomena such as global outsourcing, healthcare management, bribery, corruption, political risk and poverty add to the challenges faced by organizations, as well as competitors with new ideas and market penetrating technologies making sustainable competitive advantage for organizations elusive in order to survive in the current times In the future, organizations must renew themselves strategically.

Third: The theoretical link between the research variables

The basic ideas behind organizations adopting a lean manufacturing system can provide benefits to organizations if obstacles can be reduced to a minimum. Opportunities may be very useful for supporting product innovation, exploiting opportunities, and reducing waste means reducing time and reducing costs, which supports organizations' orientation toward entrepreneurship (Edison et al,2018:71). According to (Autio et al, 2021:2) There is a new, iterative approach to discovering and validating entrepreneurial opportunities, often referred to as "lean entrepreneurship," which is based on the idea that entrepreneurial opportunities rarely simply appear in the "market" ready to be exploited by entrepreneurs. Therefore, opportunities must be created and shaped gradually through entrepreneurial experiences through which the entrepreneur tests ideas and intuitions, weeds out those that do not seem to work, and retains those that do.

The practical

First: research scale, statistical coding, and reliability testing

A. The independent variable (lean manufacturing/according to the Toyota model) This variable was measured based on the scale mentioned (Loyd et al, 2020:1449) Which consists of (4) sub-dimensions (unification and standardization, integrated quality, timely production, culture) and consists of (27) items .
 B. The dependent variable (entrepreneurship for organizations) was based on the scale mentioned (Yiu & Bruton, 2007: 529-530). It consists of (3) sub-dimensions (innovation, organizational adventure, strategic renewal) and consists of (14) items. Table (1) shows the variables, their sub-dimensions, the number of items for each dimension, the sources relied on in the scale, as well as the Cronbach alpha coefficient. According to Table (1), only the Cronbach coefficient reached alpha for the two variables (0.800, 0.713), respectively, and the statistical symbol used in the analysis

Table (1): Research scale, statistical symbol, and Cronbach's alpha coefficient

| Cronbach's alpha coefficient | Source | Statistical code | Number of items | Dimensions | variable |
|------------------------------|-----------------------------|------------------|-----------------|-------------------------------|-----------------------------------|
| 0.800 | Loyd et al,2020)(| S1-S5 | 5items | Standardization and stability | Lean Production System LEAN |
| | | Q1-Q7 | 7items | Built-in Quality | |
| | | J1-J6 | 6items | Just-in-Time | |
| | | C1-C9 | 9items | Culture | |
| 7130. |)Yiu & Bruton,2007:529-530) | I1-I6 | 6items | Innovation | Corporate entrepreneurship ENT |
| | | V1-V4 | 4items | Venturing | |
| | | S1-S4 | 4items | strategic renewal | |

Second: Normal distribution test

Show us a test (Kolmogorov-Smirnova) and the (Shapiro-Wilk) test for the lean manufacturing variable and the entrepreneurship variable showed that the value of (Sig) was greater than (0.05). This indicates that the data follows a normal distribution for both variables, as is clear in Tables (2) and (3). Figures (2) and (3) also show the normal distribution curve of the data

Table (2) Normal distribution of the lean manufacturing variable

| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|----------|---------------------------------|-----|-------|--------------|-----|------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| LEA N | .052 | 150 | .200* | .988 | 150 | .210 |

Table (3): Normal distribution of the entrepreneurship variable

| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|-----|---------------------------------|-----|------|--------------|-----|------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| ENT | .089 | 150 | .015 | .987 | 150 | .183 |

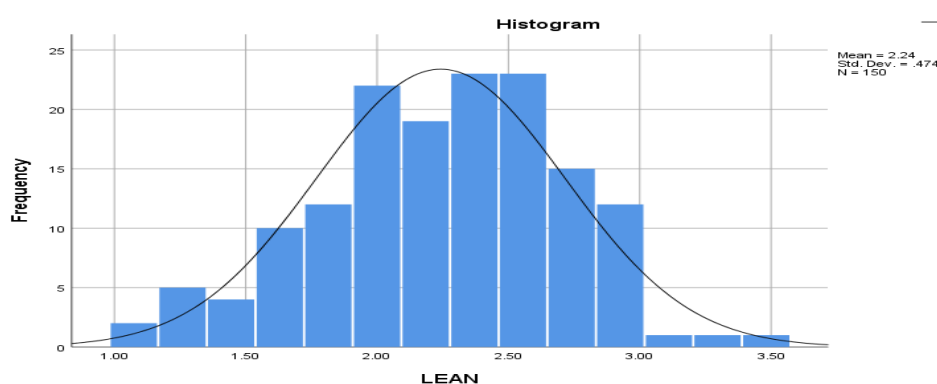


Figure (2) Normal distribution curve for the lean manufacturing variable

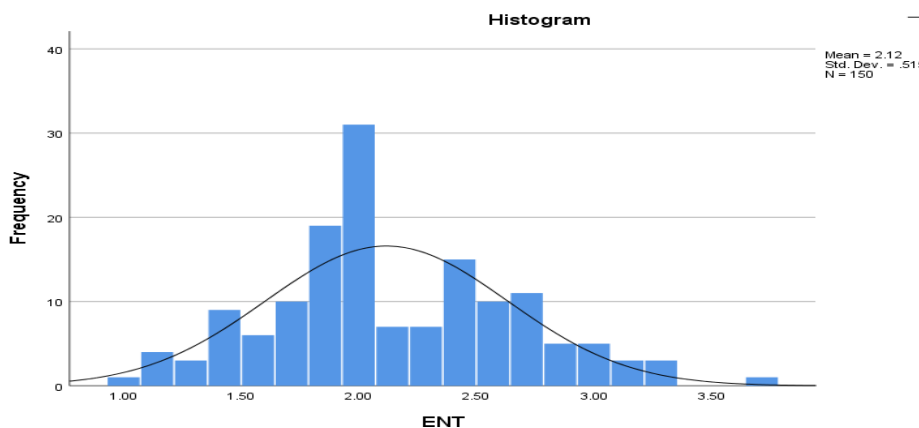


Figure (3): Normal distribution curve for the entrepreneurship variable

Third: Testing apparent validity and confirmatory validity (structural)

The researcher presented the questionnaire before distributing it to the respondents to a group of experts and specialists in order to clarify the paragraphs and their wording to verify the apparent validity of the questionnaire. Some of the dimensional paragraphs were modified and worded to suit the nature of the application environment. As for confirmatory (constructive) validity, which shows us the relationship of the paragraphs to their dimensions based on On the data collected, exploratory factor analysis was not used, given that the measures used in the research are ready-made measures that had been previously tested by

other researchers. Confirmatory factor analysis was used, which is a type of structural equation modeling that enables the researcher to verify the validity of the factor structure. Internal criteria for the approved measurement standards, and criteria are considered to ensure the saturation of the items on the dimensions, as mentioned (Schumacker & Lomax, 2015:169) First, the saturations between all dimensions and their paragraphs must be more than or equal to (0.40). The second is the goodness of fit indicators, which are (CMIN/DF < 5, IFI > 0.90, CFI > 0.90, IFI > 0.90, RMSEA < 0.08).

It was also mentioned (Meldrum,2010,3) The intended sample size, as recommended by most researchers, should be more than (100) respondents in order to allow the use of structural equation modeling to obtain good and valid results.

1. Confirmatory factor analysis of lean manufacturing change

The structure of the lean manufacturing variable includes four dimensions: (standardization (5) items, embedded quality (7) items, just-in-time manufacturing (6), culture (9) items). It is clear from Figure (4) that the values of all dimensional paragraphs achieved standard saturation higher than the specified standard of (0.40), which indicates their acceptance statistically, with the exception of paragraphs (Q2, Q3Q4, J2, J3, C5, C6) that were deleted because they were not saturated with the standard value (0.40), and (4) variance relationships were conducted between the items of the scale according to what the program indicated through (Modification Indices). Table (4) also shows the comparison indicators for accepting the quality of matching that were mentioned, and they all turned out to be identical, and this shows the correspondence between the data that was mentioned. It was collected from the questionnaire with the assumed structural model of the measurement model represented here by the lean manufacturing scale.

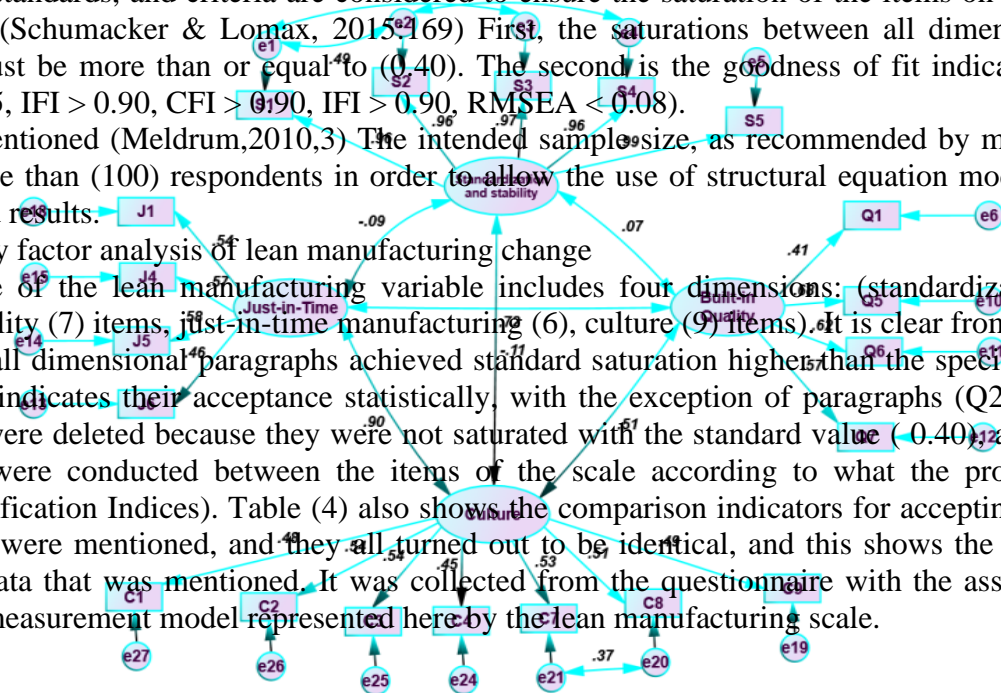
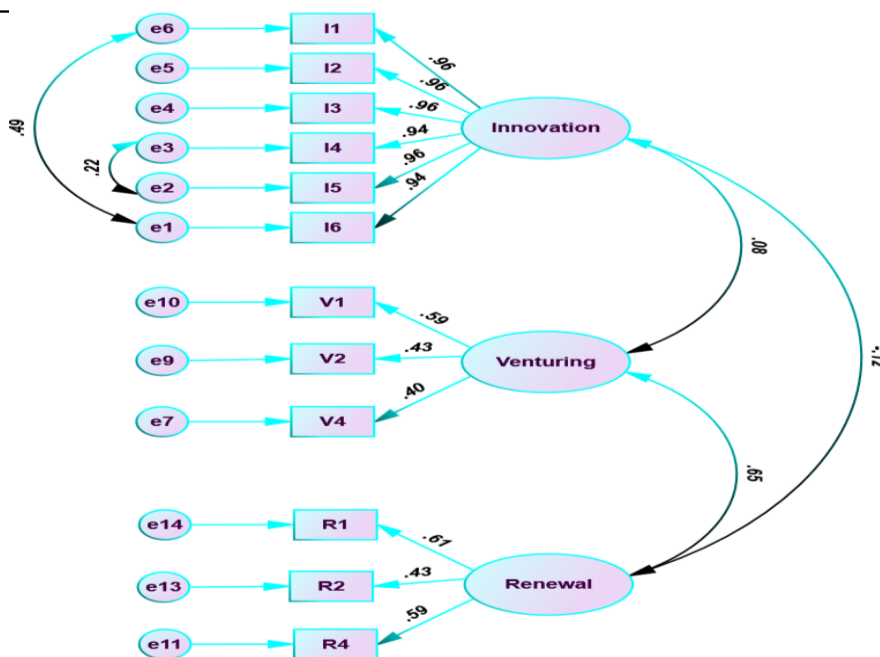


Figure (4) Confirmatory factor analysis of the lean manufacturing variable

Table (4) model matching criteria

| | |
|-------|---------|
| 1.558 | CMIN/DF |
| 0.948 | TLI |
| 0.956 | CFI |
| 0.957 | IFI |
| 0.061 | RMSEA |

2. Confirmatory of the entrepreneurship The structure of the entrepreneurship includes three (innovation (6 organizational items), strategic items). It is clear that the values of paragraphs had a saturation higher specified standard indicates their statistically, with the paragraphs were deleted



factor analysis variable variable dimensions: items), adventure (4 renewal (4 from Figure (5) all dimensional standard than the of (0.40), which acceptance the exception of (V3, R3) that because they

were not saturated with the standard value (0.40), and (2) was also conducted.) Contrast relationships between the items of the scale according to what the program indicated through (Modification Indices). Table (5) also shows the criteria for comparison indicators to accept the quality of matching that were mentioned, and they all turned out to be identical, and this shows the correspondence between the data collected from the questionnaire and the structural model. The measurement model represented here by the entrepreneurship scale is assumed.

Figure (5): Confirmatory factor analysis of the entrepreneurship variable

Table (5): Model matching criteria

| | |
|-------|---------|
| 1.066 | CMIN/DF |
| 0.948 | TLI |
| 0.988 | CFI |
| 0.998 | IFI |
| 0.021 | RMSEA |

Fourth: Descriptive analyzes of respondents' answers

Show us the table (6) Descriptive statistics (arithmetic mean, standard deviation, coefficient of variation, and relative importance) for the sub-dimensions of the research variables as well as for the overall variables. According to (Mazahreh et al., 2009: 403), the level of answers was determined in light of the arithmetic circles by determining their affiliation. For five categories: (1-1.80): very low, (1.81-2.60) low, (2.61-3.40) moderate, (3.41-4.20) high, (4.21-5.00) very high.

1. Statistical description of the lean manufacturing variable

It can be seen from the results of the table (6) The highest arithmetic mean was obtained after manufacturing in time, as it reached a value of (2.35), a standard deviation of (0.753), a coefficient of variation (32.02), and a relative importance of (47.04), which is low. This means that the Arab Integration Factory under study should pay attention to trying to manufacture Products at the time of their request and according to the required quantities and not producing in quantities exceeding what is needed, which leads to their accumulation in warehouses and thus leads to not utilizing space properly and time, effort and more costs. It was also the lowest weighted arithmetic mean obtained after standardization, as it reached a value of (1.78), a standard deviation of (0.846), a coefficient of variation of (47.46), and a relative importance of (35.65). The overall arithmetic mean of the variable reached (2.24), standard deviation (0.474), coefficient of variation (21.14), and relative importance (44.84).

2. Statistical description of the entrepreneurship variable

It can be seen from the results of the table (6) The highest arithmetic mean obtained after the organizational adventure was (2.36), standard deviation (0.835), coefficient of variation (35.46), and relative importance (47.10), which is low. The explanation for this is that the Arab integration factory under discussion must try harder to venture. Exploiting the opportunities provided by the environment, assessing risks accurately, and taking them in order to achieve growth, compete, and obtain competitive advantages. It was also the lowest weighted arithmetic mean obtained after standardization, as it reached a value of (1.81), a standard deviation of (0.827), a coefficient of variation (45.61), and a relative importance of (36.27). The overall arithmetic mean of the variable was (2.12), standard deviation (0.515), coefficient of variation (24.33), and relative importance (42.35).

Table (6): Statistical description of the research variables and dimensions

| Results of the statistical description of the lean manufacturing variable | | | | | |
|---|--------------------------|----------------|------|-----|----------|
| Relative importance | Coefficient of variation | Std. Deviation | Mean | N | Variable |
| 35.65 | 47.46 | 0.846 | 1.78 | 150 | S |
| 46.78 | 32.23 | 0.754 | 2.34 | 150 | Q |
| 47.04 | 32.02 | 0.753 | 2.35 | 150 | J |
| 46.98 | 27.71 | 0.651 | 2.35 | 150 | C |
| 44.84 | 21.14 | 0.474 | 2.24 | 150 | LEAN |
| Results of the statistical description of the entrepreneurship variable | | | | | |

| Relative importance | Coefficient of variation | Std. Deviation | Mean | N | Variable |
|---------------------|--------------------------|----------------|------|-----|----------|
| 36.27 | 45.61 | 0.827 | 1.81 | 150 | I |
| 47.10 | 35.46 | 0.835 | 2.36 | 150 | V |
| 46.73 | 34.37 | 0.803 | 2.34 | 150 | R |
| 42.35 | 24.33 | 0.515 | 2.12 | 150 | ENT |

Fifth: Testing the correlation hypothesis

The research verified the level of correlation and correlation between variables through a statistically determined correlation matrix in the program SPSS, which contains the independent variable lean manufacturing and the dependent variable entrepreneurship. Correlation analysis helps determine whether the emergence of the lean manufacturing variable is linked to the emergence of entrepreneurship within a factory. Arab integration is under discussion.

The correlation relationship that was imposed by the researcher explores the nature and level of correlation of the independent variable, lean manufacturing, and the entrepreneurship variable, which is considered statistically as (there is a statistically significant correlation between lean manufacturing and entrepreneurship), as the Pearson correlation coefficient was adopted to determine the extent Accept the hypothesis. It is clear from Table (7) that there is a very strong correlation relationship amounting to (0.751**), which is a statistically significant value. This result indicates the acceptance of the alternative hypothesis regarding the relationship between the independent variable (lean manufacturing) and the dependent variable (entrepreneurship), and that The direction of this relationship is a positive direction, and this indicates that the emergence of the lean manufacturing variable requires the emergence of the entrepreneurship variable. The value of the correlation is considered significant, which was within the level of significance (1%) as it reached (0.000), that is, with a level of confidence in the result (99%), and it is interpreted This relationship is that the availability of a level of lean manufacturing in the Arab Integration Factory will inevitably lead to a good percentage of entrepreneurship, and based on the above, the test results indicate acceptance of the correlation hypothesis, the content of which is (there is a statistically significant correlation between lean manufacturing and entrepreneurship) within the Arab integration factory under investigation.

Table (7): Correlation coefficient between lean manufacturing and entrepreneurship

| | | Dependent variable |
|-----------------------------|---|--------------------|
| Independent variable | | ENT |
| LEAN | Pearson Correlation | .751** |
| | Sig. (1-tailed) | .000 |
| | N | 150 |
| The outcome of the decision | There is a very strong, positive, statistically significant correlation between lean manufacturing and entrepreneurship | |

Sixth: Testing the impact hypothesis

The impact hypothesis that was imposed by the researcher is explored to verify the amount of influence of the independent variable on the dependent variable, which is statistically expressed as (there is a statistically significant effect of lean manufacturing in entrepreneurship) and will be tested using the structural modeling method. Table (8) and Figure (5) show the set of results related to testing the direct effect of the lean manufacturing variable and the entrepreneurship variable. The value of the coefficient of determination (interpretation) (R2) for lean manufacturing with the entrepreneurship variable was (0.56), and this indicates that manufacturing Lean waste explains (56%) of the changes that occur at the level of entrepreneurship, while the remaining percentage (44%) is due to the influence of other variables that were not studied in the statistical model of the research, while the value of the standard effect was (0.75), which is a value that indicates that the coefficient The marginal slope indicates a positive direct relationship between the variable lean manufacturing and entrepreneurship. This means that whenever the level of availability of the independent variable (lean manufacturing) increases by one unit, the dependent variable (entrepreneurship)

will increase by (75%). These values are considered significant. Moral significance because the (critical value C.R.) shown in Table (8), amounting to (13.880), is a significant value at ($P < .001$). This indicates acceptance of the hypothesis that suggests the existence of a significant influence relationship between lean manufacturing and entrepreneurship. Based on the above results, there is support for accepting the path of the influence hypothesis between the independent variable and the dependent variable, which matches the expectations of the research in its intellectual framework.

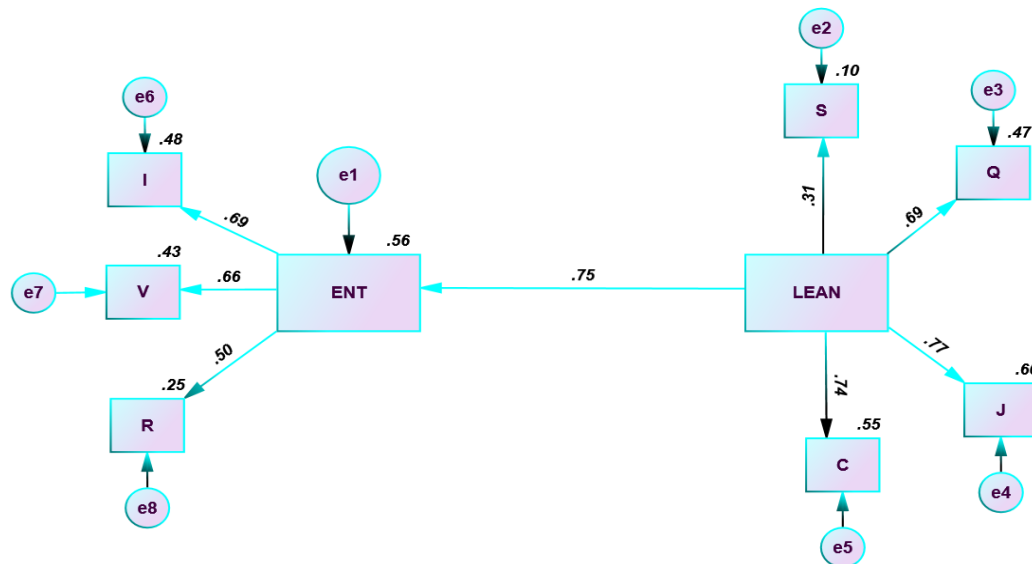


Figure (5) Testing the impact hypothesis

Table (8) Regression paths and weights to test the direct effect hypothesis

| Path | | Estimate | S.E. | C.R. | P |
|------|-----------|----------|------|--------|-----|
| ENT | <--- LEAN | .816 | .059 | 13.880 | *** |
| S | <--- LEAN | .555 | .139 | 3.990 | *** |
| Q | <--- LEAN | 1.094 | .095 | 11.574 | *** |
| J | <--- LEAN | 1.230 | .082 | 14.912 | *** |
| C | <--- LEAN | 1.021 | .075 | 13.568 | *** |
| R | <--- ENT | .774 | .111 | 6.976 | *** |
| V | <--- ENT | 1.065 | .100 | 10.635 | *** |
| I | <--- ENT | 1.108 | .095 | 11.638 | *** |

Conclusions

- 1.The management of the Arab Integration Factory under discussion is trying to unify its production processes and make them as stable and repeatable as possible with the aim of reducing costs, time and effort, and educating the working individuals, which leads to increasing their experience, but it was not at the required level.
- 2.The management of the Arab Integration Factory seeks to make quality its slogan in the workplace and to enable working individuals to ensure that quality is within production standards and a culture spread throughout the factory and everywhere, but the management’s steps towards achieving this are still below the level.
- 3.Factory management is trying with reasonable efforts to implement a lean manufacturing system in order to achieve the most important goals, which are higher quality, lower cost, and shorter time, but despite this, management efforts are still below the level required to achieve this.
4. The factory management encourages the working individuals to put forward new and creative ideas and find unconventional solutions to the organizational problems facing the factory and encourages the individuals to adopt a culture of innovation, but this is still below the level of the future ambitions and visions of the management.

5.The factory management seeks to achieve entrepreneurship and compete with organizations operating in the local markets with products of lower costs and reasonable quality in order to obtain a larger market share and a competitive advantage that enables the management to find a place for it in the local and then global markets, but these endeavors are still below the level Required expectations and ambitions

6. There is a correlation between the lean manufacturing variable and entrepreneurship. We conclude from this relationship that if there is a reasonable level of the lean manufacturing variable, the entrepreneurship variable must be present with it.

7. There is an impact of the lean manufacturing variable on entrepreneurship, and we conclude from this impact that the factory's senior management, if it wants to achieve a sustainable competitive advantage, expand its market share, and compete with international products in local markets, relying on innovation and adventure, and renewing its strategic plans and strategic positioning, must be aware of The concept of lean manufacturing that can achieve these goals

Recommendations

1.The management of the factory under study must adopt the concept of lean manufacturing in all its dimensions and apply it in a clear and understandable manner to all working individuals, and support efforts towards achieving this by the factory's senior management.

2.Invite the management of the factory under discussion to hold scientific courses and seminars to spread the culture of lean manufacturing by inviting experts and professors and in cooperation with universities specialized in this field.

3. The factory management should support innovation in a more realistic way and give the working individuals the freedom to express creative ideas that achieve the planned strategic goals, through the participation of the working individuals in the strategic plans and organizational and production problems and giving them independence in making immediate decisions in the workplace.

4. Encouraging the factory's senior management to take risks, exploit available opportunities, and correctly assess potential risks.

5. Urging the factory's senior management to renew its strategic plans and make them flexible to suit environmental conditions and economic and political changes, as well as updating its short- and long-term goals on an ongoing basis.

6. It is necessary for the factory management to know good relationship management with consumers in order to identify their requirements and expectations and try to meet them in the form of new products that serve the factory and achieve profitability and success.

7.Urging the factory management to stop waste in the production process and improve the productivity of working individuals, as well as monitor and analyze the factory's external environment correctly and well to identify the nature of the competition facing the factory.

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