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The role of implementing lean six sigma approach as a strategic HRM role on Talent Management Process

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Abstract

Recently, Talent Management (TM) was presented as an innovative approach for fostering creativity, balancing work-life commitments, enhancing motivation, reducing demotivation. However, lack of utilizing talented human capitals, which was counted as waste of resources, necessitated the implementation of lean six sigma as a strategic HRM role with TM. This research aims to create a conceptual framework model that defines the relationship between implementing lean six sigma approach as a strategic HRM role, talent management approach.

To achieve that aim, a research strategy consisted of literature review and questionnaire is designed to gather data sufficiently rich to cover the research topics and investigate the perception and application of pharmaceutical companies towards implementing lean six sigma as a strategic HRM role with talent management practices. Although only SEDICO was surveyed as a case study, other companies that share similar characteristics will benefit from the application of the framework towards creating competitive advantage.

Key Words;, Talent Management, Lean Six Sigma .

Introduction

Most of Business professionals admitted that lean six sigma is a contemporary quality excellence methodology for achieving the set goals in addition to achieving competitive advantages for the organization.

Although Lean Six Sigma is best known as a project-based improvement structure, but Lean Six Sigma is much broader than that. Lean Six Sigma is an established philosophy, an organizational and improvement structure as well as a set of tools. Using this perspective Lean Six Sigma addresses organizational issues with respect to competitiveness, cost reduction, and customer satisfaction.(1)

To deliver excellent results in talent management process, lean six sigma can be used as a strategic resource for problem solving, being more innovative in sourcing, recruiting, on-boarding talented employees in an attempt to create a competitive advantage.

Organizations like General Electric (GE) and Toyota are companies working to implement LSS approach for:-(2)

- Increase Productivity
- Improve quality for products and services.
- Reduce operational costs.
- Talent's dynamic usage
- Improve Communications Among the Team

Talent management of talented worker is becoming of great importance for the organizations which are working on global level. The demand for key position talented employees is high because those are the persons who will steer the organization and will be responsible to take the organization towards the peak of success, this is the reason organizations are in a state of fight for the best people(3).

1- Alfaro, C. R., Madrigal, G. B., & Hernández, M. C. (2020). Improving forensic processes performance: A Lean Six Sigma approach. *Forensic Science International: Synergy*, *2*, 90-94.,.

2- Bryan Rodgers&Jiju Antony(2019): Lean and Six Sigma practices in the public sector:a review, Heriot-Watt University, Edinburgh, UK,.

3- Khoreva, V. and Kostanek, E. (2019), "Evolving talent management patterns and challenges in Russia and .Kazakhstan", Baltic Journal of Management, Vol. 14 No. 3, pp. 411-426

Depending on your ambition and need, Lean Six Sigma can be implemented in phases.

Literature reviews about lean six sigma:

In pharmaceutical companies, Lean Six Sigma is a continuous improvement approach that focuses on improving customer satisfaction, speed, quality, and reducing process variation and defects.

Generally, the literature reviews about lean six sigma were to improve measures such as safety, efficiency, quality and customer satisfaction, to identify and eliminate waste, to define critical success factors for lean six sigma implementation, and to support staff to examine every process happened in their department.

Hence (Purwanto, Agus, et al.2020)[1] ,(Winatie, Adha, et al,2020)[2] , (Sneha Chavva, B. 2020)[3] discussed various tools for lean six sigma in pharmaceutical case studies such as; fishbone diagram, FEMA, pareto diagram. These studies depended on just in time and linking LSS to business strategy for more successful implementation.

The study of (Raja Sreedharan, V., et al, 2020)[4] focused on reviewing the impact of Lean Six Sigma (LSS) on HR practices from the literature arena. The study has reviewed 68 research articles. From the review, key findings concerning that LSS and HR go along very well and can be used as a strategy for creating competitive advantage. Implementing lean six sigma in human resource enhances its practices through depending on top management commitment, effective training, organizational culture, linking LSS to business strategy and finally just in time.

1-Purwanto, A., Wirawati, S. M., Arthawati, S. N., Radyawanto, A. S., Rusdianto, B., Haris, M., ... & Yunanto11, D. A. (2020). Lean Six Sigma Model for Pharmacy Manufacturing: Yesterday, Today and Tomorrow. *Systematic Reviews in Pharmacy*, *11*(8), 304-313.

2-Winatie, A., Saroso, D. S., Purba, H. H., & Wirani, A. P. (2020, July). Reducing of Defects in the Drug Tablets Production Process with DMAIC to Improve Quality–Study Case of Pharmaceutical Industry. In *IOP Conference Series: Materials Science and Engineering* (Vol. 852, No. 1, p. 012126). IOP Publishing

3-Sneha Chavva, B. (2020). *A Comparative Study on Lean and Six-Sigma Implementation at Various Pharmaceutical Industries in India and Ireland* (Doctoral dissertation, Griffith College).

4-Raja Sreedharan, V., Balagopalan, A., Murale, V., & Arunprasad, P. (2020). Synergizing Lean Six Sigma with human resource practices: evidence from literature arena. *Total Quality Management & Business Excellence*, *31*(5-6), 636-653..

Additionally, the study of (Lin Grensing-Pophal, 2020)[5] which depended on communication skills, effective training as the most important dimensions for lean six sigma implementation. The study was about how to implement Lean and Six Sigma in Talent Acquisition, the author tried to adopt of Lean Six Sigma methodology and tools to improve operational efficiency in all areas of the organization, including in HR.

The company reduced its recruiting cycle time by 56 percent by improving the company's social media presence, simplifying the job application and better defining Lawson's sales representative position. This was accomplished through a wide range of process improvements, including the use of technology to streamline some processes.

Literature reviews about talent management

Literature on talent management advocates that organization image and performance can be enhanced, if the capabilities of individuals are utilized accurately and successfully. In knowledge economy, the main issue is to find attract, develop and retain the talented people, so organizations are putting their focus on gaining and maintaining the competent people with them[1].

Studies concerning TM are largely conducted in USA and other developed countries (Hyun Mi Park, 2020)[2] , and very few researches have been initiated in developing and non-western countries (Roberto Luna-Arocaset al,2020)[3] . Therefore, TM can be an emerging concept for many Asian countries. There is a dearth of literature to confirm whether the practice of TM in Western countries implies the same meaning for Asian countries. (Bhatia, R.,et al, 2020)[4] conducted a study among the employees of Indian BPO(Business Process

5-Lin Grensing-Pophal.(2020), Lean and Six Sigma in Talent Acquisition. International journal for lean six sigma,7, 430-466.,

1- Meyers, M. C., van Woerkom, M., Paauwe, J., & Dries, N. (2020). HR managers' talent philosophies: prevalence and relationships with perceived talent management practices. The International Journal of Human Resource Management, 31(4), 562-588..

2- Hyun Mi Park, (2020). Talent management dilemma and distance between South Korea and the USA, International Journal of Export Marketing, 2020, vol. 3, issue 4, 335-355

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3- Roberto Luna-Arocaset al,(2020), Talent Management, Affective Organizational Commitment and Service Performance in Local Government, —The Busch School of Business, Department of Management, Washington, DC 20064, USA..

4- Bhatia, R., & Baruah, P. (2020). Exclusive talent management and its consequences: a review of literature. Asian Journal of Business Ethics, 9(2), 193-209.

Outsourcing) companies to find out the role of engagement in talent retention. The findings revealed that the higher the level of engagement, the greater will be the retention rate but only for a shorter period. This is because country like India has huge labor force but limited skilled employees; therefore, such employee-engagement practices cannot be directly applied in Indian organisational context. Practices adopted from western countries have to be customized according to the culture of the country. Through a study of Motorola India-Mobile Devices Business, Kravariti, F., et al(2020)[(1)] explored the relationship between talent acquisition and employee engagement level where they found that employees feel more passionate about their work and exhibit desired behaviors when there is a fit between recruitment needs and culture of the organization. Similarly, (Veselova, A. et al,2020)[(2)] in a study of talent retention in 281 service MNCs across six Asian counties, namely, Indonesia, Malaysia, Philippines, Singapore, Taiwan and Thailand, found that talent management is dependent on country-specific variables (culture and social networks), Exclusive talent management and its consequences: a review of... 197 and not all formal HR practices lead to talent retention. However, Asian firms heavily rely on informal recruitment methods, and thus, they have better retention rates.

Research problem Identification

In this study, the researcher focuses on depending on LSS as a system for improving the ways in which a talent management process operates.

The problem could be defined as follow:

" Is there an influence relationship for lean six sigma approach as a strategic HRM role on promotion the talent management process in the Egyptian pharmaceutical companies, especially SEDICO Pharmaceuticals?"

Research Importance

For the academic perspective

1- Kravariti, F., & Johnston, K. (2020). Talent management: a critical literature review and research agenda for public sector human resource management. *Public Management Review*, *22*(1), 75-95.
2- Veselova, A. & Latukha, M. & Veselova, L., 2018. "Talent Management in Asia-Pacific Region: How Not to Lose Global Competition for Talents," Working Papers 15120, Graduate School of Management, St. Petersburg State University..

-Highlighting the importance of lean six sigma methodology in emphasizing the ability to deliver high quality at a low cost which is central to the organizational success and survival.

-More focus on the best model for lean six sigma that enable the organizations to hire the right person, right skills, and right fit.

For the Empirical perspective

-Enhancing talent management process through implementing lean six sigma approach.

-In order to have a competitive advantages, organizations have to attract the right person to the right place, how to handle their employees on the day they decide to leave.

Research Objectives

1-To investigate the lean six sigma approach as a strategic HRM role in talent management process.

2- To create a conceptual framework model that defines the relationship between implementing lean six sigma approach as a strategic HRM role, talent management approach.

Researcher Hypotheses

- There is significant relation between the five components of lean six sigma as a strategic HRM Role and talent acquisition.
- There is significant relation between the five components of lean six sigma as a strategic HRM Role and talent evaluation.
- There is significant relation between the five components of lean six sigma as a strategic HRM Role and talent development.
- There is significant relation between the five components of lean six sigma as a strategic HRM Role and talent retention.

Research operational framework

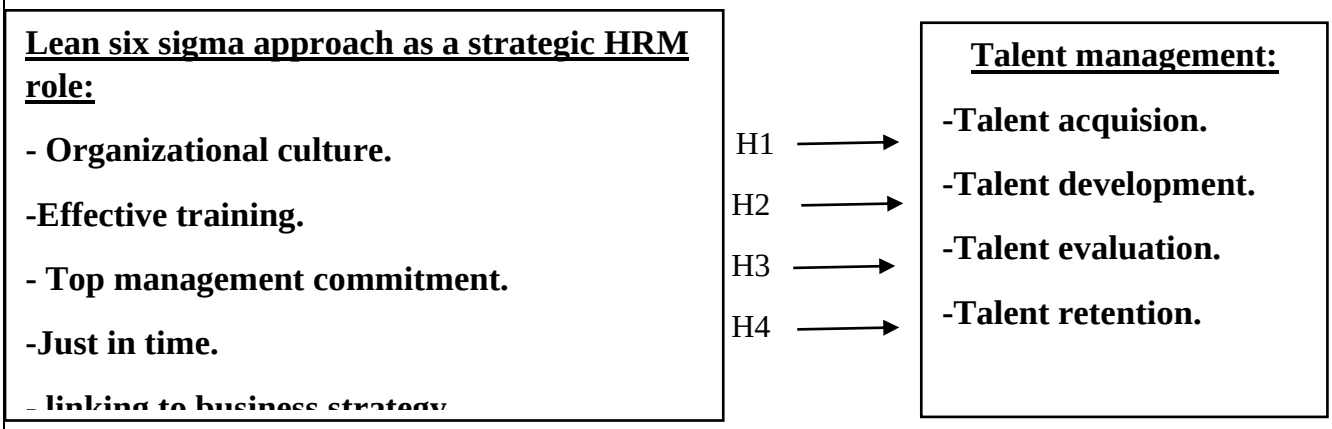


Figure (1) operational framework, designed by the researcher

Research Boundaries

Time

- October 2022 to December 2022 for the pilot study.
- 2020 to 2023 for the main study.

Place

The Egyptian pharmaceutical companies especially on SEDICO Pharmaceutical Company as a case study.

Research Population

Accordingly, the study will be applied on a sample of employees on SEDICO Pharmaceutical Company.

Research sampling unite

Simple random sample consists of 384 employees in senior and middle management at SEDICO Pharmaceutical Company, to produce reprehensive sample.

Research Methodology, tools, Plan

Research Methodology

This study is conducted through exploratory, descriptive and analytical methodologies as follows;

Exploratory Methodology:

- ❖ Quantitative analysis was under taken such as questionnaire for exploring the three key components.

Descriptive Methodology:

- ❖ For describing the theoretical base for the study in the theoretical study.

Analytical Methodology:

- ❖ The study covered both methodologies which are quantitative and qualitative research methods.
- ❖ The qualitative involves three questionnaires distributed to the employees within SEDICO Pharmaceutical Company that the researcher applies the study on them.

Research tools

- Interviews; The researcher conducted interviews with 50 employees from the senior and middle management.
- Questionnaires;

To ensure the validity and reliability of the study, the measurement items are adapted from exiting scales in the literature that have been developed and used from previous studies. All constructs were measured using multiple items and all items are measured via five-point Likert-type scales, ranging from "5" (highly satisfied) to "1" (highly dissatisfied).

Table (1) lean six sigma scale:

Dimensions	N. Measurements	Reference
Organizational culture.	5	J. Singh, H. Singh,2019 Noor Hazilah et.al,2018 Raja sredharan,et.al2020
Effective Training.	6	Costa,et.al,2020 Swaranker,et.al,2020 sarman,et.al,2022
Top management commitment.	6	Olga maria,et al2021 sarman,et al2022
Just in Time.	8	Swaranker,et.al,2020 Costa,et.al,2020 Lizarelli,et.al,2020
Linking to business strategy.	5	Jiju Antony,et al 2022 Sarman,et.al2022

Source: Designed By the researcher

Table (2) Talent management scale:

Dimensions	N. Measurements	Reference
Talent Acquisition.	6	veselova et al., 2020 Chirapat Kaewnaknaew.,2022
Talent Retention.	6	Alex anlesinya,et.al,2020. Stephen,et.al,2020. Mujtaba M,et.al,2022
Talent Evaluation.	6	Alex anlesinya,et.al,2020. Chirapat Kaewnaknaew,2022.
Talent Development.	6	veselova et al., 2020Chirapat Kaewnaknaew.,2022

Source: Designed By the researcher

Research Plan

The research divided into;

1- Research definitions.

2- Research dimensions.

3- Research model.

4- Statistical analysis.

1.1-LSS definitions;

The improved quality of processes and products is one of the most important modern business strategies. Development and implementation of an effective quality excellence strategy has become a crucial factor for the long-term success of organizations. Thus, the ability to deliver high quality at a low cost is central to an organization's success and survival.

Based on the above figure; Lean Six Sigma (LSS)[(1)] is a contemporary quality excellence methodology that allows firms to accomplish this objective through a combination of Lean and Six Sigma. Lean focuses on rapid process improvements (by elimination of waste and improving flow) and Six Sigma focuses on robust quality improvements (by reducing process variation and defects).

1- **Juliani**, F., & de Oliveira, O. J. (2020). Linking practices to results: an analysis toward Lean Six Sigma deployment in the public sector. *International Journal of Lean Six Sigma*.

(Vallejo, V,et al)[2] revealed that LSS is a methodology to improve operations and increase their advantage over competitors. The application of LSS can bring benefits to companies in terms of competitive advantage; lead time increases of up to 80%, quality and operation cost reductions by 20% and improvements to delivery times of up to 99%.

1.2- TM definitions;

Although TM as a field has evolved in the past decades, scholars are yet to reach consensus on clear-cut definitions as the concept has been defined severally by different scholars.

(O'Connor, E.P.et al(2019))[1] the recognition and acceptance that all employees have talent together with the ongoing evaluation and deployment of employees in positions that give the best fit and opportunity (via participation) for employees to use those talents.

(King and Vaiman (2019))[2] defined talent management as an integrative and inclusive philosophy of TM whereby the organisation's full workforce is seen as organisational talent in complement to the differentiated identification of specific workforce segments and individuals who are identified as having higher relative potential to contribute to the firm's performance and advantage through active development, retention and deployment in strategic positions

(Anlesinya, A.,et al (2020))[3] argued that talent management is characterised by slightly higher human resource-related investments in high performers or high potential employees, while at the same time investing broadly in the development and deployment of talent within the organization.

2- Vallejo, V. F., Antony, J., Douglas, J. A., Alexander, P., & Sony, M. (2020). Development of a roadmap for Lean Six Sigma implementation and sustainability in a Scottish packing company. *The TQM Journal*.

1– O'Connor, E.P. and Crowley-Henry, M. (2019), "Exploring the relationship between exclusive talent management, perceived organizational justice and employee engagement: bridging the literature", Journal of Business Ethics, Vol. 156 No. 4, pp. 903-917, doi: 10.1007/s10551-017-3543-1.

2– King, K.A. and Vaiman, V. (2019), "Enabling effective talent management through a macro-contingent approach: a framework for research and practice", BRQ Business Research Quarterly, Vol. 22 No. 3, pp. 194-206

3- Anlesinya, A., & Amponsah-Tawiah, K. (2020). Towards a responsible talent management model. *European Journal of Training and Development*.

(mitosis2021)[4] and (shah2021)[5] agreed that talent management is strategic HR investments to attract, develop, retain high performers.

2.1- LSS dimensions;

2.1.1- Organizational culture: Culture is the general customs, characteristics, beliefs, and knowledge of a particular group of people. While organizational culture is a system of shared values, assumptions and beliefs of the people behave in organizations. This can be defined as how employees understand each other's viewpoints well enough to agree with them as genuine and make changes in the organization[1].

2.1.2- Effective Training

Effective LSS training program would provide the platform to groom LSS experts and LSS project leaders, equipped with comprehensive LSS knowledge [2]. It is critical to provide the opportunity for employees to improve their skill and knowledge and connects the employees into the LSS world through training. Identify the need of training and development of training content are the two fundamental steps to ensure an effective training program.

2.1.3- Top management commitment (TMC)

Top management involvement and provision of appropriate resources and training is an important strategy in implementing a success LSS methodology[3].

4- Mitosis, K. D., Lamnisos, D., & Talias, M. A. (2021). Talent Management in Healthcare: A ..Systematic Qualitative Review. Sustainability, 13(8), 4469

5- Shah, G., Memon, N., & Tunio, G. (2021). Need for Talent Management and Investigating Its Impact on Organizational Performance of Higher Education Institutes. International ..Review of Management and Business Research, 10, 168-182

1- Antony, J., Lizarelli, F. L., & Fernandes, M. M. (2020). A global study into the reasons for Lean Six Sigma project failures: Key findings and directions for further research. *IEEE Transactions on Engineering Management*, *69*(5), 2399-2414.

2- Madhani, P. M. (2022). Lean Six Sigma deployment in retail industry: enhancing competitive advantages. *Available at SSRN*...

3- Sreedharan V, R., Sunder M, V., Madhavan, V., & Gurumurthy, A. (2020). Development of lean six sigma training module: evidence from an emerging economy. *International Journal of Quality & Reliability Management*, *37*(5), 689-710.

Top management commitment, support and guidance is essential for any quality implementation project to champion their employees' required skill and training development.

2.1.4- Linking to business strategy

Sarman,et.al (2022[1]) identified a weak link between LSS projects and strategic objectives of any business as part of top four critical failure factors. As suggested by Nursasongko, et al, the integration of lean and Six Sigma or sequential implementation alongside other competitive advantage measures must be part of cultural and strategic decision making of managers in any organisation.

2.1.5- Just in time

Just in time is a form of operations management method that dates back to the 1950s in Japan. It was implemented by Toyota and other Japanese manufacturing businesses, with great success: Toyota and other companies that followed the technique saw large increases in productivity[2].

2.2- TM dimensions:

2.2.1- Talent Acquisition

Talent Acquisition is the process of finding and acquiring skilled candidates for organizational needs and to meet any labor requirement. When used in the situation of the recruiting and HR profession, talent acquisition usually refers to the talent acquisition department or team within the Human Resources department[3].

2.2.2- Talent Evaluation

1- Sarman, S., & Soediantono, D. (2022). Literature Review of Lean Six Sigma (LSS) Implementation and Recommendations for Implementation in the Defense Industries. *Journal of Industrial Engineering & Management Research*, *3*(2), 24-34.

2- Nursasongko, H., Niman, N., & Biardhian, L. E. (2022). Sosialisasi Penggunaan Lean Six Sigma dengan Konsep DMAIC untuk Menghilangkan Muda Proses Pengambilan Baut Lebih dari Standar. *Jurnal Ilmiah Wahana Pendidikan*, *8*(11), 443-454.

3- Mujtaba, M., Mubarik, M. S., & Soomro, K. A. (2022). Measuring talent management: a proposed construct. *Employee Relations: TheInternational Journal*

Talent evaluation seems to be one of the most important, since it provides information that can be used when attracting new employees, planning the development of those already employed in the company, succession and managing career growth and personnel risks[1]. Additionally[2]; Talent evaluation tests are based on hiring and retention case studies and analyzing employee data. The test results will give the company an indication of how close a match the candidate taking the test will be to the company's hiring specifications.

2.2.3- Talent development is a set of learning experiences designed to enhance the applied skills and competencies of employees [3]. Development engages employees to perform better, and enlists leaders in advancing their organization's people strategies [4].

2.2.4- Talent retention

In the current business and social environments, firms are increasingly aware of the importance of employees with excellent abilities—also called key employees—for achieving success [5]. These talented workers with high potential are particularly valuable to organizations, so they become a scarce resource to be attracted and retained. The challenges most frequently mentioned by human resources (HR) professionals are retaining the best employees.

1- Kravariti, F., & Johnston, K. (2020). Talent management: a critical literature review and research agenda for public sector human resource management. *Public Management Review*, *22*(1), 75-95..

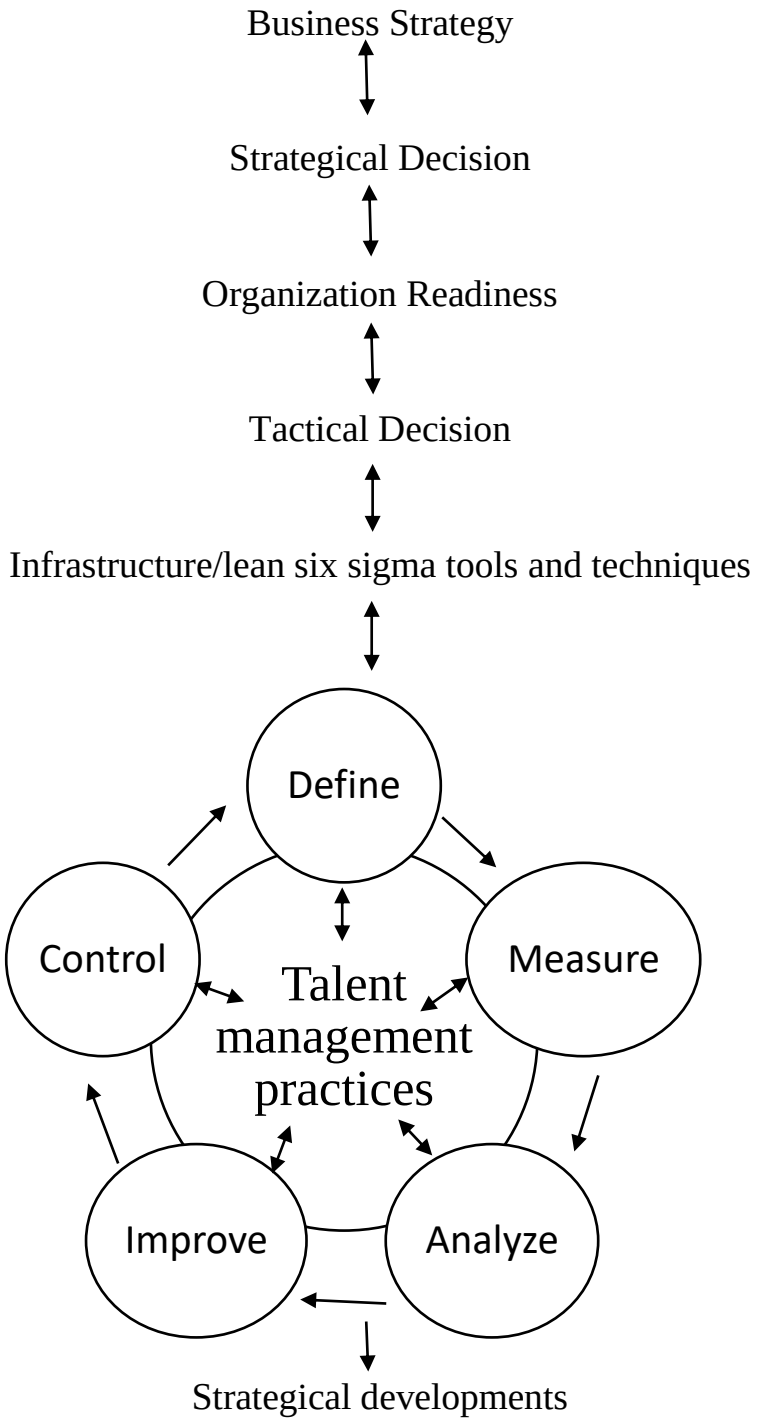
2- Luna-Arocas, R., & Lara, F. J. (2020). Talent management, affective organizational commitment and service performance in local government. *International Journal of Environmental Research and Public Health*, *17*(13), 4827..

3- O'Connor, E.P. and Crowley-Henry, M. (2019), "Exploring the relationship between exclusive talent management, perceived organizational justice and employee engagement: bridging the literature", Journal of Business Ethics, Vol. 156 No. 4, pp. 903-917, doi: 10.1007/s10551-017-3543-1.

4- Kilani, Y. M. (2022). The Impact of Human Talent Management Strategies on the Business Intelligence System A Field Study on the Royal Jordanian Airlines. *Journal of Positive School Psychology*, 9605-9614.

5- Luna-Arocas, R., Danvila-Del Valle, I., & Lara, F. J. (2020). Talent management and organizational commitment: the partial mediating role of pay satisfaction. *Employee Relations: The International Journal*, *42*(4), 863-881.

3- Research model.



(designed by the researcher)

Figure (2) LSS approach in T.M process

4- Statistical Analysis:

4.1 Respondents' Demographics

Table 4.1: Demographic characteristics

Variable	*Category*	*Count*	*%*
Gender	Female	63	46.0%
	Male	74	54.0%
Age	Less than 30 years old	30	21.9%
	From 30 - 40 years old	59	43.1%
	From 40 - 50 years	30	21.9%
	more than 50 years	18	13.1%
Marital Status	Married	97	70.8%
	Single	40	29.2%
Qualification	Bachelor	77	56.2%
	Diploma	5	3.6%
	Master	28	20.4%
	PhD	27	19.7%
years of experience	Less than 5 years	33	24.1%
	from 5 to 10 years	38	27.7%
	From 10 to 20 years	42	30.7%
	more than 20 years	24	17.5%
Job position	Assistant manager	41	29.9%
	Head section	29	21.2%
	Manager	36	26.3%
	Supervisor	31	22.6%

The demographic characteristics of respondents were reported in table 4.1 associated with some graphs that can be found in appendix B. Between the respondents, there about 54% of the sample were males, and 46% were females. 22% of the respondents aged less than 30 years' old, 43% aged from 30 - 40 years' old, 22% aged from 40 - 50 years, and 13% aged more than 50 years.

Among the respondents, 71% were married and 29% were single. 56% of them had bachelor degree, 4% had diploma, 20% had master's degree, and 20% had PhD. The results also show that 24% had experience less than 5 years, 28% had experience from 5 to 10 years, 31% had experience from 10 to 20 years and 18% had experience had experience more than 20 years. 30% of the respondents were Assistant managers, 26% were managers, 23% were supervisors, and 21% were head section.

4.2 Relative Importance Index

Relative Importance Index (RII) is used to determine the relative importance of quality factors involved. According to Chen et al. (2010), the importance levels from the relative importance index are derived as in table 4.3. The results of relative importance index are reported in table 4.4 along with the corresponding ranking and their importance level.

Table 4.2: Importance Levels

Importance Levels	Abbreviation	Range
High	H	0.8 < RII < 1.0
High-Medium	H-M	0.6 < RII < 0.8
Medium	M	0.4 < RII < 0.6
Medium-Low	M-L	0.2 < RII < 0.4
Low	L	0.0 < RII < 0.2

From the ranking table that fifty-nine items were identified as “High” importance levels which are considered of prime importance for the selection of its constructs. These “High” importance indicators have RII in the range of 0.861–0.800. The results also show that eleven items were identified as “High-Medium” importance levels which are considered of second importance for the selection of its constructs. These “High-Medium” importance indicators have RII in the range of 0.799–0.737.

Table 4.3: Ranking criteria for the selection of items

Variable	*Dimension*	*Item*	*Mean*	*RII*	*Ranking within the Dimension*	*Ranking within the Variable*	*Overall ranking*	*Import-ance level*
Lean Six Sigma	**Organizational Culture**	OC1	4.26	0.853	2	2	2	H
		OC2	4.25	0.850	3	3	3	H
		OC3	4.21	0.842	4	6	7	H
		OC4	4.31	0.861	1	1	1	H
		OC5	3.69	0.737	5	30	70	H-M
	Effective Training	ET1	4.22	0.844	1	5	5	H
		ET2	4.15	0.831	2	9	17	H
		ET3	4.01	0.801	3	25	56	H
		ET4	3.90	0.780	5	28	67	H-M
		ET5	3.88	0.775	6	29	68	H-M
		ET6	3.98	0.796	4	26	63	H-M
	Top Management Commitment	TMC1	4.16	0.832	1	8	16	H
		TMC2	4.04	0.807	6	23	46	H
		TMC3	4.07	0.813	4	21	39	H
		TMC4	4.12	0.825	2	13	25	H
		TMC5	4.04	0.809	5	22	43	H
		TMC6	4.09	0.819	3	19	33	H
	Just in Time	JIT1	4.11	0.822	6	16	28	H
		JIT2	4.07	0.815	7	20	38	H
		JIT3	4.12	0.823	4	14	26	H
		JIT4	3.92	0.784	8	27	66	H-M
		JIT5	4.12	0.823	5	15	27	H
		JIT6	4.17	0.834	1	7	12	H
		JIT7	4.13	0.826	2	10	21	H
		JIT8	4.12	0.825	3	12	23	H
	Linking to Business Strategy	LBS1	4.22	0.844	1	4	4	H
		LBS2	4.09	0.819	4	18	31	H
		LBS3	4.03	0.806	5	24	48	H
		LBS4	4.10	0.820	3	17	29	H
		LBS5	4.13	0.826	2	10	21	H

Talent Management	**Talent Acquisition**	TA1	4.21	0.842	1	1	6	H
		TA2	4.15	0.829	2	3	19	H
		TA3	4.00	0.800	6	18	57	H
		TA4	4.08	0.816	5	7	35	H
		TA5	4.12	0.825	4	5	24	H
		TA6	4.14	0.828	3	4	20	H
	Talent Development	TD1	4.17	0.834	1	2	12	H
		TD2	4.01	0.801	4	17	55	H
		TD3	3.99	0.799	6	21	60	H-M
		TD4	4.05	0.810	2	10	42	H
		TD5	4.01	0.803	3	15	53	H
		TD6	4.00	0.800	5	19	58	H
	Talent Evaluation	TE1	4.03	0.806	2	12	49	H
		TE2	3.93	0.785	5	23	64	H-M
		TE3	4.01	0.801	3	16	54	H
		TE4	3.93	0.785	5	23	64	H-M
		TE5	4.00	0.800	4	20	59	H
		TE6	4.04	0.809	1	11	45	H
	Talent Retention	TR1	4.06	0.812	3	9	41	H
		TR2	3.99	0.797	6	22	61	H-M
		TR3	4.02	0.804	4	13	51	H
		TR4	4.02	0.804	5	14	52	H
		TR5	4.07	0.813	2	8	40	H
		TR6	4.09	0.819	1	6	31	H

4.4 Internal Consistency Reliability

Table 4.4: Reliability of measurement model analysis

Construct	***Cronbach's Alpha***	***rho_A***	***Composite Reliability***	***Remark***
Culture	0.841	0.854	0.889	Reliability attained
Effective Training	0.916	0.916	0.935	
Just in time	0.929	0.93	0.942	
LSS	0.974	0.976	0.976	
Linking to business strategy	0.922	0.924	0.942	
Talent Management	0.982	0.982	0.983	

Talent acquisition	0.932	0.933	0.946	
Talent development	0.93	0.931	0.945	
Talent evaluation	0.951	0.952	0.961	
Talent retention	0.958	0.958	0.966	
Top management Commitment	0.908	0.91	0.929	

Despite its popularity, Cronbach's alpha is criticized for assuming that all of the indicators have equal outer loadings, and that the number of indicators influences the calculation of Cronbach's alpha in that fewer items produces lower value, especially in scales with items fewer than 10 (Pallant, 2010, Hair et al., 2017). Due to the limitations of Cronbach's alpha, researchers are advised to use other measures of internal consistency such as composite reliability (CR), and rho (Jöreskog, 1971). Jöreskog rho measure is a better reliability measure than Cronbach's alpha in SEM, since it is based on the loadings rather than the correlations observed between the observed variables (Demo et al., 2012). CR measures the internal consistency while considering that each indicator has a different outer loading. Following the previous rules, the reliability of each construct was assessed using the calculations provided in SmartPLS. The results in Table 4.4 show that all constructs had a reliability (Cronbach's Alpha, rho, and Composite Reliability) score of more than 0.70.

4.5 Convergent Validity

Table 4.5: Convergent validity (AVE)

Construct	**Average Variance Extracted (AVE)**	***Remark***
Culture	0.618	Accepted
Effective Training	0.705	
Just in time	0.668	
LSS	0.576	
Linking to business strategy	0.764	
Talent Management	0.708	
Talent acquisition	0.746	
Talent development	0.741	
Talent evaluation	0.806	
Talent retention	0.827	
Top management Commitment	0.686	

The AVE is a common measure used to establish convergent validity which represents the grand mean of the squared loadings of the indicators measuring a construct. The AVE of a construct should be 0.50 or higher to be considered

significant. Following the previous guidelines, the convergent validity through AVE was established as shown in table 4.5.

4.6 Descriptive statistics

Table 4.6: Descriptive Statistic for the Selected Variables

Construct	Mean	SD	CV
Organizational Culture	4.143	0.698	16.84%
Effective Training	4.022	0.836	20.79%
Top Management Commitment	4.088	0.733	17.93%
Just in Time	4.095	0.754	18.41%
Linking to Business Strategy	4.115	0.750	18.22%
Talent Acquisition	4.117	0.787	19.12%
Talent Development	4.039	0.824	20.41%
Talent Evaluation	3.989	0.920	23.06%
Talent Retention	4.041	0.896	22.17%
Lean Six Sigma	**4.093**	**0.685**	**16.75%**
Talent Management	**4.047**	**0.816**	**20.17%**

These include; mean (M), standard deviation (SD), and coefficient of variation (CV) were calculated and reported in table 4.6. The descriptive statistics for the independent variable "*Lean Six Sigma*" were $(M = 4.093, SD = 0.685, CV = 16.75\%)$, for the dependent variable "*Talent Management*" were $(M = 4.047, SD = 0.816, CV = 20.17\%)$. Between the dimensions of *Lean Six Sigma*, it was found that *Organizational Culture* has the highest average $(M = 4.143)$, and the minimal variability $(SD = 0.698, CV = 16.84\%)$. Moreover, among the dimensions of *Talent Management*, it was found that *Talent Acquisition* has the highest average $(M = 4.117)$, and minimal variability $(SD = 0.787, CV = 19.12\%)$.

4.7 Coefficient of Determination

Table 4.7: R Square and Associated R Square Adjusted

Construct	R Square	R Square Adjusted	Remark
Talent Management	0.797	0.795	High
Talent acquisition	0.756	0.754	High
Talent development	0.788	0.786	High
Talent evaluation	0.673	0.67	High

Talent retention	0.699	0.696	High

Coefficient of determination (R^2) refers to the effect of independent variables on the dependent latent variables (Hair, Sarstedt, Ringle, & Mena, 2012), which is one of the quality measures of the structural model (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). R^2 estimates vary from 0 to 1, in which 0 means low explained variance and 1 means high explained variance. Researchers have used a different cut-off of R^2 value. For example, in business research, Chin (1998) suggested that R^2 with 0.19, 0.33, or 0.67 are low, moderate, or high, respectively.

The results of R Square are reported in table 4.7. the R-Square value of Talent Management equals $R^2 = 0.797$ meaning that about 80% of the variations in Talent Management ware explained by the variation in LSS.

4.8 Effect size

Table 4.8: f² Effect Size

Main Hypotheses			
Path			***f-square***
LSS -> Talent Management			3.919
Sub-Hypotheses			
Path	***f-square***	**Path**	***f-square***
LSS -> Talent acquisition	3.093	LSS -> Talent evaluation	2.056
LSS -> Talent development	3.71	LSS -> Talent retention	2.319

Table 4.8 presents the f^2 effect size of the constructs. The results illustrate that all effect sizes were significant indicating great importance to the model, and were distributed as follows: LSS have large effect on Talent Management with $f^2 = 3.919$,. The results also showed that LSS has greatest effect on Talent development $f^2 = 3.71$, compared to Talent acquisition $f^2 = 3.093$, Talent retention $f^2 = 2.319$, and Talent evaluation $f^2 = 2.056$.

4.9 Goodness of Fit of the Model

Tenenhaus et al. (2005), proposed the Goodness of Fit (GoF) as a global fit indicator; it is the geometric mean of both the average R^2 the average variance extracted of the endogenous variables. The aim of GoF's is to take into consideration the research model at all stages, i.e. the measurement model and the structural model, with an emphasis on the overall model perforemance (Henseler & Sarstedt, 2013). The GoF index for the main hypothesis can be calculated as follow:

$GOF=\sqrt{(\overline{R^2}\times\overline{AVE})}=\sqrt{(0.74\times0.72)}=0.73$.

The criteria of GoF for deciding whether GoF values are not acceptable, small, moderate, or high to be regarded as a globally appropriate PLS model have been given. According to these criteria, and the value of (GoF=0.73), it can be safely concluded that the GoF model has a higher level of fit to considered as sufficient valid global PLS model.

Research findings

The current study determined the significance of Lean Six Sigma as a strategic HRM role in the talent management process as a whole, as well as the dimensions of the talent management process separately.

The study examined the relationship between lean Six Sigma and the talent management process, and it discovered a significant positive relationship.

The following is a discussion of the hypothesis analysis results.

- Lean six sigma has a greater effect on talent development, followed by talent acquisition, then talent retention, finally; talent evaluation, as showed in the next figure:.

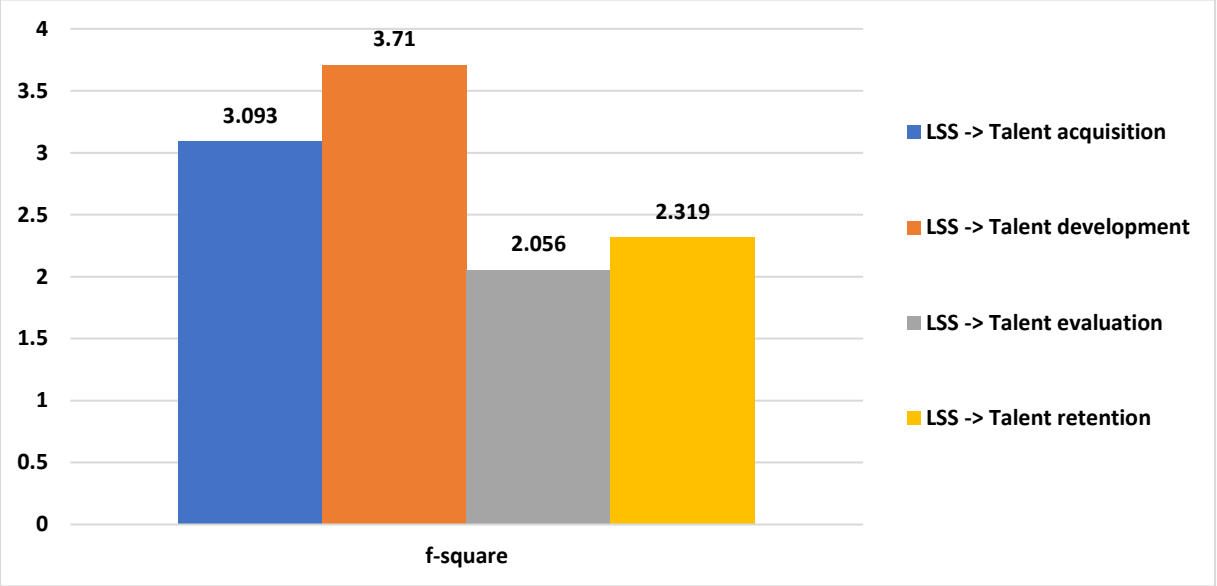


Fig. 4.1: the effect of LSS on Talent Management dimensions

- There is a direct significant effect between the five components of lean six sigma as a strategic HRM role and talent acquisition.

- There is a direct significant effect between the five components of lean six sigma as a strategic HRM role and talent development.

- There is a direct significant effect between the five components of lean six sigma as a strategic HRM role and talent evaluation.

- There is a direct significant effect between the five components of lean six sigma as a strategic HRM role and talent retention.

Recommendations

1- LSS action plan

Goals	Sub-goals	Responsibilities Who will do it? Who will participate?	Action steps	Objectives
Implementing lean six sigma approach as a strategic HRM role.	-organizational culture. -effective training. -Top management commitment. -just in time. -linking to business strategy.	The implementation of these goals is the responsibility of the senior management. All department in the organization should participate in it. *Lean Six Sigma can benefit every department with a focus on measuring performance indicators, not just outcomes.	-Encourage managers to closely monitor work time. -Encourage communication of successes and sharing best practices. - Provide resources to acquire training in lss improvement strategies. -Provide adequate technical training to have a high skill level compared to the competitors. -Support and actively participates in the activities of the lss projects (training, project selection, review and evaluation of results).	The time period over which the results of implementing LSS can be seen, ranges from one year up to three years. -Enhance company culture. -Gain hands-on experience in quality management, communication, and project management. -Improve business processes, maintaining quality enhancements and Reducing Project Lifecycle Time. -Eliminate errors, Saving Costs and support the organization. -Improved Employee Performance. -The employees learn how to perform better at their job, as well as how to set and surpass goals.

2- T.M action plan

Goals	Sub-goals	Responsibilities Who will do it? Who will participate?	Action steps	Objectives
Talent management process.	-Talent acquisition. -Talent development. -Talent evaluation. -Talent retention.	The implementation of these goals is the responsibility of human resource management.	-Relying on objective methods for selecting competencies. -The company focuses on defining its human resource needs on the quality with talent. -creating policies that encourage career growth and development opportunities. -the company creates individual development plans, links to firm's plan for growth rather than to generic competency levels. -the company systematically assess their worker's performance.	-Accomplishment of the organizational vision. -filtration of talented employees to retain the finest one as possible. -Employee Engagement. -Builds Effective Teams and learning Culture -Strengths the organizational culture by building strong human capital. -succeed over its competitors, establish a presence in the market. -Build up a good reputation among the job seekers.

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