

Marketing Engineering And Making Marketing Decisions

Mahmood Jasim Alsamydai

Abstract : The concept of marketing engineering has become, today, an issue of great importance because it has helped in enabling marketing management to gain information and analyze it by using computer devices, communication networks, software and marketing decisions support systems, thus helping marketing management to take marketing decisions. The term marketing engineering can be traced back to Lilien et al. in "The Age of Marketing Engineering" published in 1998. In this article the authors defined marketing engineering as the use of computer decision models in making marketing decisions. The definition of marketing engineering was also developed by Lilien et al. 2002, who defined marketing engineering as "the systematic process of putting marketing data and knowledge to practical use through the planning, design, and construction of decision aids and marketing management support systems (MMSSs)". Among the driving factors toward the development of marketing engineering are the use of high-powered personal computers connected to LANs and WANs, the exponential growth in the volume of data, and the reengineering of marketing functions. Other researcher also called marketing engineering "the systematic process of putting marketing data and knowledge to practical use through the planning, design, and construction of decision aids and marketing management support systems." Marketing management works in a variable and unstable environment, where it is requested to be flexible and interactive with these changes in the internal and external environment of the organization. There is a tremendous flow of information, where marketing engineering has to collect and analyze, by adopting information systems, information technology management decision support systems. Marketing engineering played the major role in that and enabled marketing management to adapt to and accommodate external environmental factors and take the proper marketing decisions. The objective of this paper is to know the relation between marketing engineering and the process of making marketing decisions and to provide the knowledge frame for marketing engineering, the supporting phrases of it, the technology used, as well as the information technology, marketing technology, market technology and phrases used in support of marketing engineering.

Index Terms: Communications, Development, Marketing, Marketing Decisions, Marketing Engineering, Technology, Organizational

1. INTRODUCTION

The tremendous development in information and communication, whether electronic or traditional, affects business the environment, which requires more and more research, analysis and accuracy in making marketing decisions. Marketing decisions obey and follow up engineering process and structure in design based on procedures of research, studies, gathering of data and information, and using statistical methods with modern technology in manipulating and processing these data and information targets [1],[2]. Simulation is also required to know the market and the way to deal with it and respond to its requirements and needs in order to enable marketing managers to design effective marketing plans that provide it with capabilities to achieve goals and organizational targets [1],[2]. Marketing concept differs according to the stage or phase that it is passing through. Some people believe that traditional marketing represents an art; others see it as a science. As for specialists in marketing engineering, they merge the art and the science to solve certain problems. Engineering work is concerned with solving problems as well as modifying processes and procedures to enter new products or techniques or knowledge and new methods, and this represents a solution for problems,

Solving it occurs through assigning engineers to be part of this change, by interacting and working with marketing engineering to enable this management to make marketing decisions and solve the problems that it faces by adopting developed techniques and technology and effective communication tools so that it becomes capable of working on enhancement of current products and providing new products with differentially competitive advantages. Good pricing, promotions distribution and other marketing activities are also needed to improve marketing decisions related how to communicate and approach the market. All can be done by developing scientific research concerning different marketing activities and by adopting marketing engineering [3],[4]. The direction towards marketing engineering contributes in the transformation from traditional methods to the most modern techniques, statistical methods, software and depending on internet network and statistical programs in research, development, and meeting customers' desires and needs. It enables marketing managers to implement their activities with high efficiency because statistical programs help and assist in discovering multiple alternatives that enable marketing administrations to differentiate among them and take the appropriate decision by increasing awareness and improving good practices among employees and workers in the marketing department. Besides that, marketing engineering and their tools provide an analytical method to determine the best marketing strategies and assist in making marketing decisions [5].

2 MARKETING ENGINEERING CONCEPT

The marketing engineering term was introduced first by Lilien and Arvind in 1998 [6], where they indicated that marketing engineering is formed by using decision forms and computer to take marketing decisions. In 2002, they indicated that marketing engineering represents an organized method to utilize and employ data and knowledge to drive effective marketing process to take decisions through decision-making processes supported by technology and model. Lilien et al. [7],

Mahmood Jasim Alsamydai; Department of marketing, The Faculty of Business, Al-Zaytoonah University, P.O box-130. Amman, Jordan. E-mail: Mahmood_jasim2000@yahoo.com, Phone: 0096265862982, 00962777397835.

define marketing engineering as a systematic process of putting data and marketing knowledge into practical use through planning, designing and building assistant devices to take decisions, and the systems of marketing decisions support; and to adopt local communication network and computer network which contribute to enable individuals use personal computers and share in developing and adopting marketing engineering [7], [8]. The accelerating growth in the volume of data, information and the efforts to restructure or reengineer marketing engineering businesses require the following:

- Efficiency in implementing marketing engineering
- The comparison between offer and demand along with the properties of system design for marketing decisions support
- The nature and features of an implementation process that depends widely on differences between end user systems and the developed systems of marketing decisions support system
- Employees training on using programs and communication network

The style and method that marketing engineering relies and depends on are restricted and available only to managers in large organizations who have a strong motive to adopt them in addition to huge budgets and computers connected to networks with programs that are easy to use in implementing and confirming marketing engineering methods. But the development of the communication process and the modern trends among employees, consumers and organizations to use the available communication tools like computers, network connection and mobiles play a role in increasing implementation efficiency of marketing engineering. For sure, it contributes in supporting marketing management to make and support marketing decisions in a way that it satisfies the best results when implementing these decisions on the practical side because marketing engineering is involved in following accelerated developments in the external and internal environment based on data analysis and its manipulation by statistical methods and by using statistical programs developed in this process, which contributed to gaining accurate information and took part in making the right decisions.

The main job of marketing management depends on environmental analysis for the target of defining the factors of the external environment that affect an organization's business, achieving its goals and targets, and at the same time marketing management objectives and targets, which represent part of the organization's objectives [9].

Also, marketing management usually works to identify the internal environment through available information by using records of organization and marketing department along with internal reports in order to determine and identify the weak and strong points of the organization. It will help much to describe the surrounding circumstances of the organization accurately and specifically and identify market directions by using market technology so that it will enable management to issue effective, efficient and successful marketing strategies [10].

From this, the role that marketing engineering plays becomes clear, as the process and operation through which information is put in a usable sequence by using analysis, computer and the proper statistical programs.

As a matter of fact, there are four main reasons that make

marketing engineering the future of marketing:

- Marketing is a technical job where marketers of today are using complicated technology, increasingly, to communicate with clients and customers. They must understand, for example, search engine algorithms and procedures, data analysis, marketing automation systems, popups' filters, and email marketing regulations, using applications of the programs, browsers and features of the browser across many [11],[12],[13],[14],[15],[16],[17].
- More experience is required when a marketing team develops marketing tools or mobile applications.
- Marketing authorities can also run campaigns management through social media using supervising programs and fixed assets management tools, which focus on dataware houses identical to what management systems of engineering products and operations are doing currently [11],[12],[13],[14],[15],[16],[17].
- Major marketing supervisors can now spend easily on technology more than their colleagues in information technology or technology control. Digital marketing is the field that is the fastest in growing towards marketing expenditure and gaining talents in different fields [11],[12],[13],[14],[15],[16],[17], [18].

- 3 Technology and Marketing Engineering

The foundation for marketing engineering success is the employment and use of technology, which is considered as the key to this success, especially in the current days. Marketing management receives tremendous volumes of data and information by adopting marketing information system which includes marketing researches, marketing intelligence, internal reports and work to process and manipulate data through marketing decisions support system. This system provides information about market directions, competitors, consumption attitudes for targeted markets, indicators for awareness, experience and predictions of sales, demand estimation, how far the effectiveness of the marketing mix is. It also follows variations in the external environment. All these made marketing management face huge volumes of data that require the use of modern technology to gain and gather data and information, then process and analyze them to reach positive results when used properly. For that, marketing engineering locates data and information in a usable sequence for the sake of reaching effective and successful marketing decisions [19].

The concept of technology, as stated by Alsamydai and Rudaina [20], expresses the real potentials to implement scientific knowledge for practical purposes. It includes the usage of methods, systems and devices that are produced from scientific knowledge used for practical purposes that lead to accumulated knowledge, experience, creation and invention for the sake of providing more developed techniques than the previous period, and these techniques are a result of technology. The technique for that represents a method to accomplish business through the use of developed devices, programs, software, and communication tools as well as reliance on mathematical or statistical equation to process and analyze data.

Sultan and Christian [21], indicated that adoption of communications and information technology by organizations and marketing management was of positive effect on marketing strategy, selection of targeted sectors, market

division, understanding consumer behavior, marketing campaigns management and understanding the market. Avramović [22], added that the business of successful companies demanded that these companies be interactive and flexible with the dynamic changes in the surrounding environment and in the market, which lead to the continuous, fast and accurate flow of possible and potential information through information systems and technology. The continuous development of technology of information and communication had a serious effect on businesses and their functions like sales, marketing, purchases, funding, accounting, research and development. According to Brady [23], technology had encouraged the development of marketing relations, which improved the relation between the consumer and the company by improving marketing mixture and managing the relation with customers. Communications process and technology development played an effective role in supporting marketing management to connect with current and potential customers, and at the same time, it enables the organization and marketing management to search for information concerning consumers, markets, competitors, suppliers and other factors that affect their business by using the internet, personal computers and mobiles. Also, they played a significant role in enabling marketing management to select and choose targeted markets through market analysis and market division along with understanding consumer behavior and advertising about product value for the customer. As a social point of view, marketing is the binding between the physical requirements of the society and its economic patterns [22]. This change in marketing management businesses, the technological environment, communication tools and external environment pushed and motivated market departments to reengineer their business and to adopt modern technology, develop communication methods and go towards marketing engineering because it realized the importance of marketing engineering in achieving targeted goals. The rise of developed technology and electronic communication methods contributed to getting new customers. Also, it contributes to decision making. Technology development has a major role in internet appearance which shares effectively in enabling the organization and marketing management to products marketing on the level of local and global markets and directs their activities towards the targeted market. Esha and Ashank [24], on the same subject, indicated that marketers believe that technology brings new customers and helps in following up automation. Also, it helps in making decisions. Marketers devoted their efforts, continuously and seriously, to present new ideas to market their products. This technology development shared in the development of marketing concept and directed them towards digital marketing, customer relation management, business automation and marketing engineering. Modern technology, a development that took place in communication tools and methods, and the rise of the marketing information system as a marketing job, all contribute to performance enhancement of marketing management. The use of information technology in planning and implementation of marketing activities, including traditional ones, become the basis of the formulation of marketing strategies due to positive implications for the use of this technology in raising the efficiency of the marketing performance of various organizations. The importance of the concept of technology and its reflection on marketing decision making performance in business organizations still hold the interest of many current

researchers including [25], [14], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [38] have turned their attention to information technology and its competitive advantage.

4 MARKETING TECHNOLOGY AND MARKETING ENGINEERING

Technology and its rapid developments had an impact upon finding devices, equipment, internet network, fast communication methods and social media methods, which took part in increasing the capability of organizations and marketing departments to manage and process marketing activities and reach or approach consumers. In the dynamic world of today, where globalization processes and the rapid development in technology have brought about huge and tremendous changes in the market; the creation is considered an important, critical and crucial factor to deliver new products that are capable of following up with developments occurring in consumption patterns. These products enabled organizations to create a valuable and lasting competitive advantage in a complicated and changing market. For sure, creative organizations will be more successful in producing, developing and dealing with the changing environment. They will simply own new capabilities that allow them to achieve high performance at all levels [27]. Technology development in the field of marketing activities played a major role in enabling organizations to create and develop products and all related fields, to develop strategies for all marketing activities. At the same time it shares in enabling organizations to reserve their competitive positions in the market within a rapidly changing environment. For that, creation and development became a significant sign of success for these organizations to achieve a lasting competitive advantage. Marketing technology is an expression that is synonymous with technology expression in the field of marketing. The technology development shares in finding devices and communication methods for all organizations and departments that belong to it. It founded and established, at the same time, devices, instruments and communication methods that played a basic role in the success of marketing activities. Because of that, marketing technology is represented in knowledge and experiences that contribute in formulating and executing marketing strategies by using techniques from devices, instruments, tools, communication methods and information that contribute in the development of marketing activities and the fulfillment of market needs. It facilitated and enabled the way marketing departments proceed with research and studies and collect information with the required accuracy and speed through the use of software, programs, and computer devices. It relies on marketing information systems and supports marketing decisions [18], [17], [10]. Marketing engineering provides many opportunities to use techniques and information to reengineer marketing decisions and to support new business opportunities. Also, it provides a common analytical foundation for marketing decisions that include the most recent ideas and practices related to marketing decisions industry (like markets division, products development, distribution, and connection with current and potential consumers, promotion and other activities). For all of that, marketing technology is considered to be the foundation and the base of marketing engineering. Marketing technology is the main reason for its existence and longevity [39]. It shows, based on all previous facts, that marketing engineering is a result of adopting the principle of reengineering by marketing departments and their employees.

Their activities and business involve using the technology developed, as well as information and experience, to enhance marketing decisions and respond to a market that is blustered (stormed) by rapid changes.

5 MARKETING ENGINEERING AND MARKETING INFORMATION SYSTEMS

The development that took place in external and internal environments contributed to pushing marketing management to reengineer its business and find a special department to manage marketing information systems, considering it the foundation in supporting marketing management by data and information that enable it to achieve the goals efficiently. Marketing information system (MIS) is composed of people, devices, instruments and procedures to collect, classify, analyze, evaluate and distribute critical and important information properly and provide it to decision makers in marketing. Data and information collection is usually done through marketing research and marketing intelligence where analysis is carried by using mathematical and statistical methods in the marketing decisions support system [9]. This system provides information about the market, company, managers, external partners like suppliers, distributors, marketing services agencies and other issues. However, this system cannot be implemented efficiently nowadays without relying on devices and instruments like computers, communication methods and tools, in addition to the availability of experience and information in using these devices, instruments and the proper mathematical and statistical methods [40]. Here, the relation appears between marketing engineering and marketing information system. beckoned that marketing information department realized the need to create a department that supported it to gather information in a form that is scientific, organized, and based on modern technology, devices and methods, which enabled it to establish a marketing information system [41], [29]. the marketing information system is considered an efficient tool that supports decision making. Almost all organizations are aware of the important role played by information in identifying the factors that affect organizational performance, and this role gains more efficiency by adopting modern technology. Montotoya and Ottum and Moore focused on the relation between three functions: research and development, production and marketing, integration and coordination between these functions which will share in the development, support creation processes and produce products with competitive advantage that plays a role in the success of marketing management [42]. Since all information and its processing and analysis contribute in developing marketing concepts and the tools used, they contribute in finding marketing engineering, which direct marketing departments towards the automation of their various activities depending on technology and techniques of high efficiency like computers, software, programs, statistical and mathematical models and modern communication methods. Berend and Gerrit define marketing decisions support system as "Any device that combines information technology, analytical capabilities, marketing data and marketing knowledge, where it is made available by marketing decision makers in order to enhance the quality of marketing department by depending on marketing models, marketing experts systems and marketing neural networks." [43]. Adapting the concept of marketing engineering and marketing activities has an important and

effective role in developing marketing activities as a result of knowledge, experience and techniques used in the marketing field that considered formulating marketing decision as the first step in adopting marketing engineering. Migley pointed out that "marketing engineering has an important role, not only in making and supporting marketing decisions, but also in creating and identifying four purposes codifying marketing knowledge and marketing experience [44], [45]:

- Facilitating the progress of marketing as a science
- Promoting the discipline within its institutional and professional environments
- Better educating and improving the credential of the potential manager
- Providing competitive advantage to the firm

6 MARKETING ENGINEERING AS ASSISTANT TOOL IN MAKING MARKETING DECISIONS

Adopting marketing engineering has contributed to the increasing role and efficiency of marketing management decisions support systems effectively. It has assisted marketing managers to be more effective in making decisions concerning marketing mixture factors, especially in the electronic marketing field. Marketing engineering became a companion associated with the fast and enormous development in information technology and provided, to marketing managers, an enormous volume of data that enabled them to process, manipulate and transform data to information used as support and stanchion in making marketing decisions. Marketing information system focuses on manipulating and processing this data by using programming technology, statistical programs (like SPSS), proper statistical methods (like correlation coefficient, simple linear regression, multiple regression, produce T-Test value) and other models that match the objective nature of data processing to provide marketing management with information, knowledge and experience according to the adoption of marketing engineering concept. The capability of marketing management to make successful decisions depends on the level of success of the marketing information system, the development in information technology, model methodology, marketing knowledge, marketing through the internet and the reliance on electronic companies' sites and social media sites [45]. All these have led to an advanced and important position in marketing management support systems and the marketing decisions in the organization structure of the marketing department. As a matter of fact, the practical situation for this management (administration) is the marketing decisions support system, which is considered as a part of marketing information system that includes marketing research, marketing intelligence and internal reports. Marketing decision support systems play the major role in making marketing decisions because they concentrate on data collection and process data by depending on methods developed in the analysis. These methods identify the effective factors in making marketing decisions including internal and external factors that contributed to push and drive marketing management to reengineer marketing activities and adopt the marketing engineering concept to be capable of adjusting with the marketing environment and making the right decisions [43]. Workers in the field of marketing engineering are aware of the important role that marketing engineering plays in achieving organizational objectives by recognizing the nature of products desired by consumers and also the nature of products that are provided by competitors. It works side by

side with products engineering to produce a product capable of meeting and sharing in making a decision as to product features and specifications through determining effective factors in products marketing, choosing the proper distribution points, delivering products of good quality at the right time and place and for a good price. To achieve this by marketing management, its reliance on marketing engineering plays an effective and crucial role in market reengineering or restructuring so that it can be a way to accomplish an exchange process [35], [23], [33]. Market engineering includes an organized, systematic, theoretical and practical procedure to analyze, design, enter and guarantee markets quality, in addition to its legal and canonical frame concerning market procedures, delivery and circulation rules, systems, means and intermediary, media and their business models, all at the same time. [37], [46], [47]. For Weinhardt et al.[48] market engineering depends on concepts, methods, styles, procedures and techniques from the economy, especially concepts of game theory and mechanism design. But also it borrows concepts from finance, information systems and operations research to enable marketing managers make decisions and produce successful sales strategies that leave workers in the sales department in a position to do their jobs and duties with high efficiency. The workers in market engineering work within the legal and economic environment, and this has an effect on all the business of the sales department and the organization because they deal directly with market components like partial market structure, information technology infrastructure and business infrastructure [48] Market engineering is also concerned with determining the factors that influence products marketing, choosing the proper distribution points, delivering products in the proper quality, time and place and for a suitable price. The objective of market engineering is to restructure the market to be a channel to achieve and accomplish the exchange process. Another objective for market engineering is to make the market work as efficiently as possible, from the design to the commercial exchange process. Dealing with the market concept is very useful in implementing new policies and proposing rules that reserve company style and objectives by identifying factors or elements that are most efficient in the market so that marketers can accomplish the exchange process successfully according to market engineering objectives [48], [49], [50], [51], [52].

We include the following market engineering objectives:

- Analyzing and designing commercial deals elements, market divisions, infrastructure and business structure in markets
- Determining implementation fields where coordination, based on the market, is an effective and efficient way or channel or coordination
- Producing new ways, methods, channels, tools and knowledge to markets engineering; also determining implementation fields or sectors for coordination that is based on the market
- Contributing and sharing in making decisions taken by marketing management concerning marketing activities
- Contributing and sharing in making decisions that are concerned with products and services that are produced by the organization

Lilien [5], have adopted a model that concentrated on the role of marketing engineering in making marketing decisions. The

model includes five phases, started by Data and ended by Implementation, combined with the marketing environment, as explained in Figure (1).

7 CONCLUSION

The trend and attitude towards marketing engineering contribute to transforming from using traditional methods to using the most modern techniques, statistical methods, and programs as well as depending on internet network and statistical programs in research, development, and meeting customers' desires and needs. It enables marketing managers to implement their activities with high efficiency because statistical programs help and assist in discovering multiple alternatives that enable marketing management to differentiate among them and take the proper decision by increasing awareness and improving practices of employees and workers in marketing management. Besides that, marketing engineering and their tools provide an analytical method to determine the best marketing strategies and assist in making marketing decisions. (In this paper we produced many concepts related to marketing engineering and its role in making marketing decisions. Technology and information technology are considered the foundation and the key to marketing engineering. The term marketing technology is complementary, integral and synonymous to marketing engineering and its role in making marketing decisions. In addition, market technology helps and assists marketing engineering to know the markets, consumers and the environmental factors that affect them, which can be considered their foundation and base, by using marketing engineering in designing marketing strategies and making various marketing decisions efficiently and successfully.

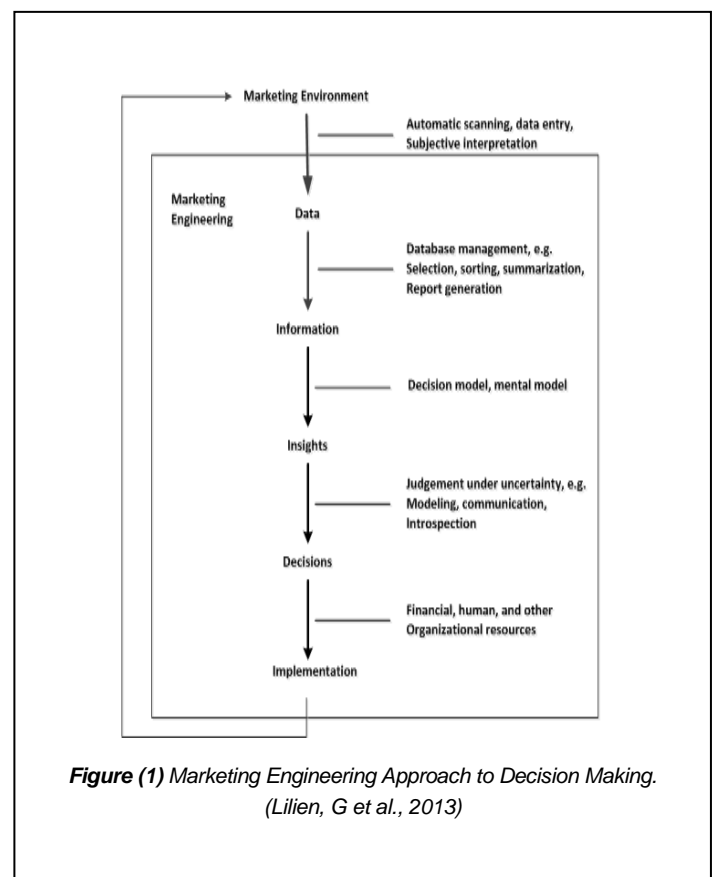


Figure (1) Marketing Engineering Approach to Decision Making.
(Lilien, G et al., 2013)

REFERENCE

- a. Ferrell, O., Gresham, L. G., & Fraedrich, J. A synthesis of ethical decision models for marketing. *Journal of Macromarketing*, 1989, 9(2), 55-64.
 - b. Hanafizadeh, P., & Zare Ravasan, A. An empirical analysis on outsourcing decision: the case of e-banking services. *Journal of Enterprise Information Management*, 2018, 31(1), 146-172.
 - c. Savransky SD. *Engineering of creativity: Introduction to TRIZ methodology of inventive problem solving*. CRC Press; 2000 Aug 29. Camilleri, M. A. *Integrated Marketing Communications*. In *Travel Marketing, Tourism Economics and the Airline Product*, 2018, (pp. 85-103). Springer, Cham
- [2] Lilien, G. L., Rangaswamy, A., & De Bruyn, A. Principles of marketing engineering. *DecisionPro*. 2nd ed. Page 2013, 7-9
 - [3] Lilien, G. L., & Rangaswamy, A. Marketing engineering: computer-assisted marketing analysis and planning. *DecisionPro*. 2004, page 11.
 - [4] Lilien, G. L., & Rangaswamy, A. (2001). The marketing engineering imperative: introduction to the special issue. *Interfaces*, 31(3_supplement), S1-S7.
 - [5] Lilien, G. L., Rangaswamy, A., & Matanovich, T. The age of marketing engineering. *Marketing Management*, 1998, 7(1), 48.
 - [6] Kotler, P., & Armstrong, G. *Principles of marketing*. Pearson education. 2014, 716 page.
 - [7] Alsamydai, Mahmood. *Modern Marketing Strategies*. Dar Al Hamed Publishing and Distribution, Amman, Jordan. 2018.
 - [8] Alsamydai, Mahmood & Yousif, Rudaina. Factors Influencing Woman Behavior to Visit Dental Clinic to Improve their Smile. *Indian Journal of Public Health Research and Development*. 2019. 10. 504-409.
 - [9] AL-SAMYDAI, Mahmood; AL-KHOLAIFEH, Ali; AL-SAMYDAI, Ali. The Impact of Social Media in Improving Patient's Mental Image Towards Healthcare Provided by Private Hospitals' in Amman/Jordan. *Indian Journal of Public Health Research & Development*, 2019. 10.2.
 - [10] Alsamydai, A. M. J. the opinions of pharmacists about the possibility of using electronic means of communication by pharmaceutical companies to facilitate the process of trade exchange. *International Journal of Business Management & Research*. 2014. Vol. 4, Issue 6, Dec, 63-72.
 - [11] Alsamydai, A. M. J., & Baqer, A. B. M. Measuring patient satisfaction regarding the quality of healthcare service provided by pharmacists. *International Journal of Medicine and Pharmaceutical Science*. 2015. Vol. 5, Issue 6, Dec, 71-84.
 - [12] Ali AL-Samydai, Lena A. Al-Elaimi, Sundos H. Abbad, Lubna Al-Khareisha, Measuring Awareness of Over the Counter Analgesics Use and Risks Associated With It Among Jordanian Population In Amman, *Asian Journal of Pharmaceutical research and Development*; 2018. 6 (5):9- 15 DOI: <http://dx.doi.org/10.22270/ajprd.v6i5.429>
 - [13] Ali Alsamydai, Ghaida' Baqa'in, Ibrahim Al-Helli, Hala Aladwan, Karim Salman, Rola Herimi, and Prof. Talal Aburjai. The Role of Information Resources on Building Health Awareness - Study Conduct in Amman Jordan, *International Research Journal of Pharmacy and Medical Sciences (IRJPMS)*, 2018. Volume 1, Issue 6, pp. 44-49.
 - [14] Alsamydai, Ali & Alsamydai, Mahmood & Yousif, Rudaina & Aburjai, Talal & Al-Mamoori, Farah & Azzam, Hanan. Protein supplements between consumer's opinion and quality control: an applied study in Jordan. *International Journal of Research in Pharmaceutical Sciences*. 2019.10. 1961-1969. 10.26452/ijrps.v10i3.1402.
 - [15] Rudaina othman Yousif, Mahmood Alsamydai, Perspective of Technological Acceptance Model toward Electric Vehicles, *international journal of mechanical and production engineering research and development (ijmperd)* 9 (5), 2019, 873–884.
 - [16] Alsamydai, Mahmood Jasim. "The Trust of Viral Advertising Messages and Its Impact on Attitude and Behaviour Intentions of Consumers." *International journal of marketing studies* 2016, 8.5 : 136.
 - [17] Alsamydai, Mahmood and Rudiana Othman *Marketing Technology*, Dar Almanhg for publishing and distribution. Amman, Jordan, 2017, 22-26.
 - [18] Alghamdi, Sultan and Bach Christian. Technological factors to improve performance of marketing strategy. ASEE 2014 zone 1 conference, April 3-5 university of Bridgeport, CI, USA.
 - [19] Avramovi ć. Mira, Information Communication Technology in The Function of Improvement of Competitive Position of Tourist Destination. *Economics and Organization*, facta universitatis series: Economics and Organization. 2010, 7(2): p. 209 – 217.
 - [20] Baker, M. J. What is marketing?. In *The Marketing Book* 2013, (pp. 25-42). Routledge.
 - [21] Esha Jain¹ & Ashank Yadav. *Marketing and Technology: Role of Technology in Modern Marketing*. IOSR Journal of Business and Management (IOSR-JBM) 2017. Volume 19, Issue 5. Ver. VI PP 49-53.
 - [22] Agan, Y. Impact of operations, marketing, and information technology capabilities on supply chain integration. *Journal of Economic and social research*, 2011, 13(1), 27.
 - [23] Alsamydai Mahmood Jasim & Dajani Dima Mousa. Measuring the Impact of Information Technology Use on the Marketing Performance of Business Organizations. *International Review of Management and Business Research*. 2016, Vol. 5 Issue.3.
 - [24] Aghazadeh, H. Strategic marketing management: Achieving superior business performance through intelligent marketing strategy. *Procedia-Social and Behavioral Sciences*, 2015, 207, 125-134.
 - [25] Alghamdi, S., & Bach, C. Technological Factors to Improve Performance of Marketing Strategy. AISEE report. 2014.
 - [26] Ali Ahmadi, A., Alahyari, A., competition strategy and innovation in business, Tolide Danesh Publications, 1th edition 2003.

- [27] Breznik, L. Can information technology be a source of competitive advantage?. *Economic and Business Review for Central and South-Eastern Europe*, 2016, 14(3), 251.
- [28] Boomak, S. The influence of Management information system and information technology on management performance and satisfaction. In *The global conference on Business and Economics*, (2007, October). ISBN (pp. 978-0).
- [29] Chan, S. H., Sutton, S. G., & Yao, L. G. Wealth Creation from Information Technology Investment: An Assessment of Firm Performance Differences Using the EVA. Presented paper, La Trobe University, University of Connecticut, and Western Michigan University, USA. 2006.
- [30] Dhar, R. L. Service quality and the training of employees: The mediating role of organizational commitment. *Tourism Management*, 2015, 46, 419-430.
- [31] Dehning, B., & Stratopoulos, T. Determinants of a sustainable competitive advantage due to an IT-enabled strategy. *The Journal of Strategic Information Systems*, 2003 12(1), 7-28.
- [32] Grudin, J.. Obstacles to participatory design in large product development organizations. In *Participatory Design 2017*, (pp. 99-119). CRC Press.
- [33] Ghorbani, H., & Fakhimi, A. A Study of the Effect of Technology & Marketing Strategies on Innovative Performance from the Standpoint of the Organizational Project Management (Case study: Home appliances manufacturing companies in Esfahan Province). *International Journal of Academic Research in Business and Social Sciences*, 2013, 3(11), 168.
- [34] Hajihaydari, N Khakbaz, S. B Pourestarabadi, M . Heydarifard, Z. Comprehensive framework for marketing information system: a systematic perspective with design science approach 2018, Vol. VI, Issue 1, January 2.
- [35] Hakhu, R., Kiran, R., & Goyal, D. Success of marketing information system (MKIS) model: Analysis of manufacturing small and medium enterprises (SMES). *Middle-East Journal of Scientific Research*, 2012 11(6), 777-786.
- [36] Stark, J. Product lifecycle management. In *Product Lifecycle Management (Volume 1)* (pp. 1-29). 2015, Springer, Cham.
- [37] Lodish, L. M., Curtis, E., Ness, M., & Simpson, M. K. Sales force sizing and deployment using a decision calculus model at Syntex Laboratories. *Interfaces*, 1988, 18(1), 5-20.
- [38] Neumann, D. G. Market Engineering: A structured design process for electronic markets. Univ.-Verlag Karlsruhe. 2004.
- [39] Ottum, B. D., & Moore, W. L. The role of market information in new product success/failure. *Journal of Product Innovation Management: an international publication of the product development & management association*, 1997, 14(4), 258-273.
- [40] Soo, C., Chen, S., & Edwards, M. G. A Knowledge-Based Approach to Public Value Management: A Case Study of Change Implementation in Disability Services in Western Australia. *Australian Journal of Public Administration*, 2018 77(2), 187-202.
- [41] Song, X. M., Montoya-Weiss, M. M., & Schmidt, J. B. Antecedents and consequences of cross-functional cooperation: A comparison of R&D, manufacturing, and marketing perspectives. *Journal of Product Innovation Management: an international publication of the product development & management association*, 1997, 14(1), 35-47.
- [42] Theaker, A. What is public relations?. In *The Public Relations Strategic Toolkit 2017*, (pp. 17-27). Routledge.
- [43] Wierenga, B., van Bruggen, G. H., & Althuizen, N. A. Advances in marketing management support systems. In *Handbook of marketing decision models 2008*, (pp. 561-592). Springer, Boston, MA.
- [44] Weinhardt, C., & Gimpel, H. Market engineering: An interdisciplinary research challenge. In *Dagstuhl seminar proceedings. Schloss Dagstuhl-Leibniz-Zentrum für Informatik.*, 2007.
- [45] Weinhardt, Christof; Neumann, Dirk. "Computer-aided Market Engineering". *Communications of the ACM*. 2006, 49 (7): 79. doi:10.1145/1139922.1139953.
- [46] Weinhardt, C., Holtmann, C., & Neumann, D. Market-engineering. *Wirtschaftsinformatik*, 2003, 45(6), 635-640.
- [47] Wierenga, B., Van Bruggen, G., & van Bruggen, G. H. Marketing management support systems: Principles, tools, and implementation 2000, (Vol. 10). Springer Science & Business Media.
- [48] Wind, J., Green, P. E., Shifflet, D., & Scarbrough, M. Courtyard by Marriott: Designing a hotel facility with consumer-based marketing models. *Interfaces*, 1989, 19(1), 25-47.
- [49] Rudaina Othman Yousif, The impact of Health Awareness Campaigns to Quit Smoking (A Case Study in Amman city), *Indian Journal of Public Health Research & Development*, Vol 10 (9).