

The Mediating Effect of Managerial Awareness on Mis and Entrepreneurial Ecosystems in Jordan

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Abstract. The purpose of current study was to examine the mediating effect of managerial awareness on the relationship between management information systems dimensions (technical, human, behavioral and organizational) and entrepreneurial ecosystems from perspective of managers and leadership working within organizations operating in the field of manufacturing single-use food packaging in Jordan. Quantitative methodology was adopted through utilizing a questionnaire that was self-administered by (147) individuals. SPSS/AMOS were employed deal with primary data. Results of study indicated the acceptance of the hypothesis arguing, *“Managerial awareness mediates the relationship between MIS dimensions and entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan”*. Implications of current study lies in helping policy and decision makers to make better decision regarding ecological and ecosystem potentials that they have or seek to get through their internal operations.

Keywords: Management Information Systems, Entrepreneurial Ecosystems, Ecological, Managerial Awareness

1. Introduction

There is a lot of research that has linked the success of entrepreneurial ventures and ecosystems to what are called entrepreneurial ecosystems today. Studies have indicated that the development of workable ecosystems in pioneering projects contributes to doubling the chances of success of these projects and improving their outputs (Cetindamar et al, 2020). Volkmann et al (2021) stressed that the interaction between individuals and workers, effective communication and organized culture, the tools and devices used, in addition to supporting innovation and creativity are sufficient to provide a fertile work environment that supports entrepreneurial projects and provides the necessary technical support for them, which can lead to an improvement in the quality of work. Products and services offered.

On the other hand, Song (2019) stressed on the idea that building effective management information systems (MIS) have a significant and sensitive role in strengthening the foundations of sustainability by directing the right decisions of the organization towards achieving the goals. When looking at the main dimensions of management information systems, we see that they are associated with the organization, the human element working in it, its adopted technologies and its internal culture. These are the main motivators in directing attention towards how to determine the role of MIS and its impact on entrepreneurial ecosystems, especially through the mediating role of administrative awareness within administrations on both level of management, higher and middle (Bischoff, 2021).

Bischoff (2021) aimed to explore the perceived entrepreneurial ecosystems under the dimensions of stakeholder theory and culture. The study adopted a questionnaire that was distributed on a sample of (225) entrepreneurs in Germany who are involved in entrepreneurship ecosystems. Results of study indicated that stakeholder theory dimension and culture dimension of entrepreneurial ecosystems have a positive and essential impact on strength of entrepreneurial ecosystems. Furthermore, the study concluded that stakeholder theory dimension and culture dimension are positively correlated with each other, indicating that a strong culture dimension can enhance the effectiveness of the stakeholder theory dimension in promoting sustainable entrepreneurship.

Volkmann et al (2021) aimed to explore areas of development and research related to entrepreneurial ecosystems for sustainability. A lot of previous theoretical literature has been reviewed and the entrepreneurial ecosystems and entrepreneurial projects are defined in terms of the challenges, motives and opportunities they present. The study concluded that entrepreneurship ecosystems are able to reach sustainable development goals, improve economic growth, and achieve community well-being, and that there are many challenges, including stakeholder cooperation, management awareness, and effective governance.

Cetindamar et al (2020) aimed at examining the level of scientific and technological empowerment in ecosystems in Sydney, Australia. The study relied on a case study in Sydney, where data were collected from (36) operating establishments in order to analyze the relationship between ecosystems and scientific and technological development. The study concluded that there is a large spread of technology and artificial intelligence, especially in entrepreneurial projects, and that these projects are clearly interested in their ecosystems as one of the means of sustainability and environmental responsibility for entrepreneurial projects. The study focused on the importance of cooperation and management awareness of ecosystems in pilot projects in order to achieve effective sustainability.

Song (2019) adopted a critical analysis of the concept of entrepreneurial ecosystem and digital development and rebuilding the concept to present a vivid understanding of this phenomenon. The critical and theoretical study was adopted for the purpose and previous studies were reviewed. The study concluded that there is a vagueness in identifying the components of the digital information system related to the ecosystem, and the lack of a unified methodology for entrepreneurial projects in order to adopt a clearer picture of the digital ecosystem for entrepreneurial projects.

According to Awwad et al. (2022), Jordan has placed significant focus on cultivating its digital

economy and startup scene. In 2019, it launched Jordan Innovation Week to nurture technological innovation and networking within the burgeoning entrepreneur community. According to 2019 data from Startup Genome, Amman ranked amongst the top 20 global startup ecosystems in terms of funding and total nascent companies. The Queen Rania Foundation Youth Employment Program aims to develop the abilities of 60,000 young Jordanians through programs focused on digital literacy, entrepreneurship, and project administration - key domains facilitated by greater MIS awareness (Al-Dalahmeh and Héder-Rima, 2021). A 2020 survey by Jordan's ICT Association found over 80% of Jordanian corporations acknowledged the significance of digital shift and cloud services for future growth. This demonstrates rising managerial priority on leveraging technologies. Several Jordanian universities such as the University of Jordan now provide specialized degree programs in fields including MIS, data analytics, and digital transformation in response to private sector demands for more tech-savvy leaders (Al-Shqairat et al., 2020; Moh'd Abu Bakir, 2019).

Based on hypotheses development above, it can be seen that there is a literary gap in gathering between the three variables of (MIS, Entrepreneurial Ecosystem and Managerial Awareness). This gap was found within the previous literature which did not take into account the role of MIS in supporting entrepreneurial success from an ecosystem point of view. In addition to that, it was seen that the managerial awareness did not mediate the relationship between the two previous variables in any recent articles.

From the literary gap, the purpose of current study is to examine the mediating influence of managerial awareness on the relationship between MIS (technical, human, behavioral and organizational dimensions) and entrepreneurial ecosystems from the perspective of managers and leaders working within organizations operating in the field of manufacturing single-use food packaging in Jordan.

Reaching the main aim of study was done through answering the following questions:

- A) What is the relationship between MIS and entrepreneurial ecosystems in an organizational environment?
- B) How can managerial awareness be of positive influence in supporting the relationship between MIS and entrepreneurial ecosystems?

In order to answer the aforementioned questions, researcher put a group of objectives to be reached that included identifying the main dimensions of MIS that intersect with entrepreneurial ecosystems. Shedding the lights on the importance of entrepreneurial ecosystems awareness within the internal operations of the organization. In addition to focusing on the process of how managerial awareness can be of help in supporting such a relationship.

It is worth mentioning here that previous studies proved that technology in all its forms have the ability to better support ecosystem and entrepreneurial efforts through organizational practices. However, there was a shortage in focusing on how the awareness on human capital especially the management in an organization would encourage individuals to be more effective in that space.

Highlighting the relations between variables was done through the a model, researcher has built the following model from which hypotheses were extracted:

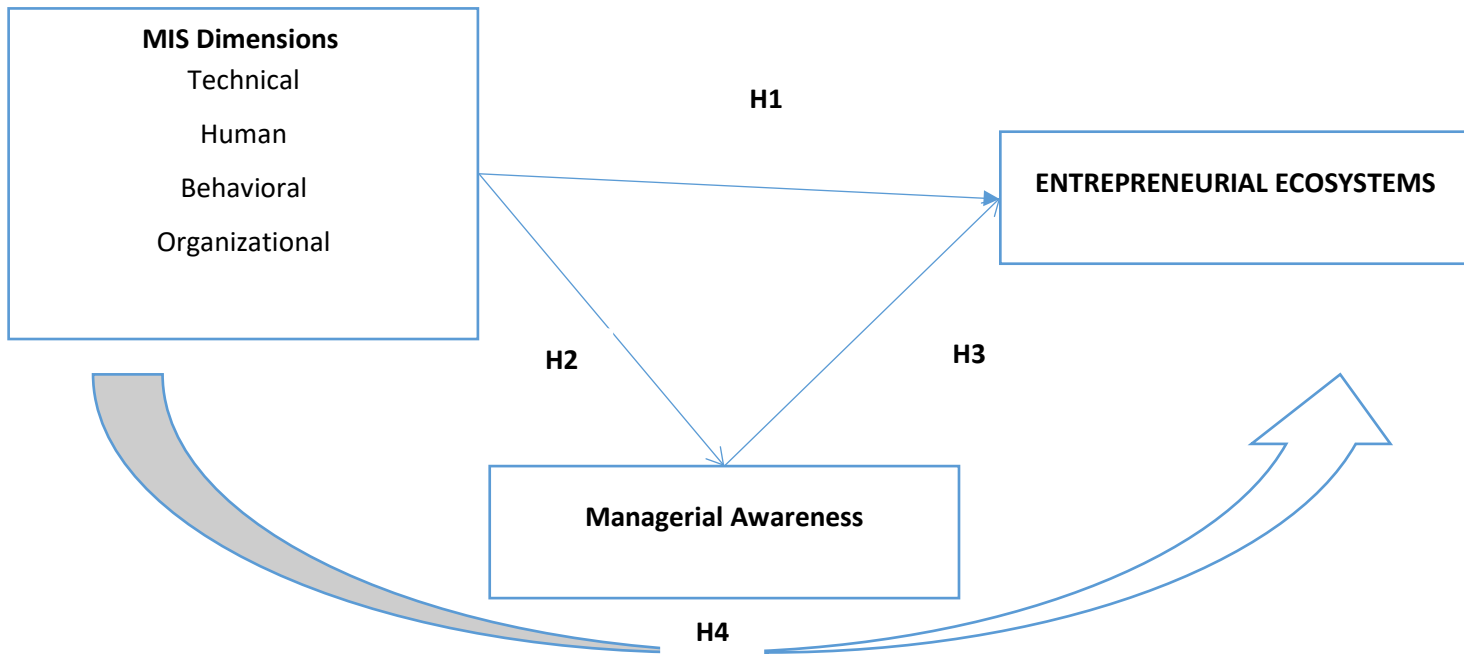


Fig.1: Study Model

H1: MIS dimensions have a statistically significant influence on entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

H2: MIS dimensions have a statistically significant influence on managerial awareness from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

H3: Managerial awareness has a statistically significant influence on entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

H4: Managerial awareness mediates the relationship between MIS dimensions and entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

2. Literature Review

2.1. Management Information Systems MIS

Berdik et al (2021) indicated that management information systems, or as known (MIS), are systems adopted by the organization, and their aim is to collect, store, and analyze information resulting from organizational operations. This information is usually able to provide support to management in order to make the most appropriate management decisions, and it is able to identify strengths and weaknesses in the organizational strategy (Ismagilova et al, 2019; Hashem, 2016).

Song (2019) presented MIS as a set of different tools and techniques that have the ability to lead the right management decisions. While Beynon-Davies (2019) saw as systems adopted by the organization in order to convert data into information of value and significance for the organization and its management, including hardware, software, behaviors, and people. From perspective of Davis and Yen (2019) MIS was one of the critical tools for the success of the modern organization, as it helps the

organization to reach the most appropriate decisions and implement them in a way that guarantees the success of the organization and the achievement of its goals.

2.2. Dimensions of MIS

He et al (2021) confirms that MIS improves the quality of managerial decisions, and it also provides a clear map of the path that the organization takes and clarifies the opportunities, challenges and threats in order to deal with them smoothly. Bednar and Welch (2020), Rossi et al (2019), Tamilmani et al (2021), and Tallon et al (2019) confirmed that MIS is based on a set of the most important and influential dimensions, including:

2.2.1. Human Dimension

This dimension is very important, and it represents the individuals working in the organization and the skills they possess in order to manage the aforementioned systems, devices and networks. The importance of the human dimension launches from the idea that it is the main trigger for management operations, data analysis and access to the required information. Organizations are interested in training the human dimension and developing its skills in order to facilitate the possibility of dealing with these systems in a smooth and easy way.

2.2.2. Technical Dimension

This dimension focuses on devices, computers, networks, and software that are employed in order to deal with organizational data. This dimension also includes databases and the mechanism for dealing with them, internal and external networks that are used to exchange information between individuals and organizations, in addition to the structure The technological infrastructure on which the organization relies in its work.

2.2.3. Organizational Dimension

Organizational dimensions is very crucial, and it refers to the culture of the organization is an important dimension of the MIS dimensions, it is mainly the internal culture, the extent to which it supports innovation, stimulating critical thinking, creativity, and thus continuous improvement. In other words, the organizational dimension in MIS can be represented in the existence of a culture of information exchange between management, stakeholders and employees, in addition to cooperation, resource allocation, innovation and creativity.

2.2.4. Behavioral Dimension

Behavior as a dimension is an important factor, as behavior refers to the procedures and methods used in collecting, analyzing and providing information necessary for making administrative decisions. It also includes the behaviors of individuals working within the organization in terms of effective cooperation and continuous communication between employees, suppliers, management and stakeholders in order to achieve organizational goals in all its forms.

2.3. Entrepreneurial Ecosystems

Cao and Shi (2021) and Volkmann et al (2021) defined entrepreneurial ecosystems as a network of organizations, resources, and individuals that provide full support in order to maintain sustainability in entrepreneurial ventures in a particular geographic area or industry.

Entrepreneurial ecosystems are built on a group of stakeholders, entrepreneurs, investors, government agencies, and business incubators that work to create an environment that encourages innovation and collaboration for entrepreneurship based on environmental foundations and high sustainability (Audretsch et al, 2021).

As for Fernandes and Ferreira (2021) indicated that the main components of entrepreneurial ecosystems include capital, a supportive environment, an entrepreneurial culture, talent, and various market networks. It works to promote entrepreneurial projects, accelerate economic growth and create

job opportunities, in addition to contributing to the well-being of all societies. Perhaps the most important example of an entrepreneurial ecosystem is Silicon Valley in the United States, which has included a large number of globally successful companies in the past decades (Wurth et al, 2022).

Stam and Van de Ven (2021) confirmed that entrepreneurial ecosystems are considered one of the important factors in entrepreneurship. Its vision is targeted to achieve environmental sustainability and ensure an improvement in the environmental performance of entrepreneurial projects and operate within several areas that include as according to Cantner et al (2021), Theodoraki et al (2022), Prokop et al (2021) and Elia et al (2020):

Waste management

It is based on adopting all practices related to the collection, storage, treatment and disposal of solid, liquid and hazardous waste in a healthy and safe manner. Its main objective is to legalize and reduce the negative effects of industrialization on the environment and the quality of its elements.

Environmental resource management

The environmental systems of the leading projects work to enhance and improve the water use machine so as to guarantee the best level of sustainability in addition to wastewater management.

Renewable energy

It is all the practices on which the environmental systems of pilot projects are based in order to generate renewable energy and reduce dependence on fossil fuels.

Environmentally friendly products

These practices encourage organizations to design environmentally friendly products, reduce waste, and improve energy efficiency

Regulations and laws

These include the regulations and instructions adopted and launched by organizations in order to improve the environmental performance of pioneering projects such as monitoring emissions, drainage, storage, and waste, and adopting incentives for distinguished environmental performance.

Awareness

The role of management appears in educating workers in pilot projects about the importance of environmental issues and sustainability, and improving environmental performance based on environmentally friendly practices.

Content et al (2020) points out that entrepreneurial ecosystems are represented by many characteristics, the most important of which is the integration of their environmental and social dimensions, as these systems work to preserve the environment and develop society, and thus achieve both goals at the same time. As for Roundy (2020), he summarized that entrepreneurial ecosystems target sustainability by preparing the local community in the long term to implant the values of sustainability in them and improve the quality of life of individuals in the community through cooperation with the local and international community of individuals, groups, organizations and governments. As for Roundy and Bayer (2019), he indicated that the concept of ecology in entrepreneurial projects adopts the foundations of cooperation, innovation, and the development of new solutions for the environment. It also deepens the concept of social responsibility for organizations so that they are keen to adopt the necessary measures to ensure environmental sustainability.

2.4. Managerial Awareness

According to Kharel et al (2022), managerial awareness is defined as the ability of senior and middle management to understand and realize the influences that would interfere with managerial performance. Adekola et al (2021) noted that managerial awareness includes the ability of management to think strategically, plan for threats and challenges, and exploit available opportunities. As for Pathak et al

(2021) and Jensen et al (2021), managerial awareness includes identifying the problems that organizations' management may face, analyzing these problems, evaluating them, and making the most appropriate decisions to address them in order to ensure success and continuity of work.

Rogayan and Nebrida (2019) stated that a management that is aware or a management that has the needed awareness is recognized by having full understanding of the technology adopted in the organization and its impact on managerial performance. As del Carmen Rodríguez-Hernández and Ilarri (2021), indicated that it is the management that is characterized by the ability to adapt to changes and the possibility of being aware of the development and continuous change of the technological tools adopted in the organization. On the other hand, it was found Bautista et al (2019) that it is the administration that adopts the foundations of strategic analysis in order to achieve organizational goals. While Fortes et al (2021) emphasized that the aware administration in management is aware of the importance of environmental and social responsibility for the organization and emphasizes the importance of the ecosystem of organizational work in all its forms.

3. Methods and Materials

The research adopted the quantitative approach as a path to realize hypotheses of study. The suitability of the quantitative approach came from its ability to take a larger sample size and present numerical data that can be easily explained and highlight the phenomenon under examination. A questionnaire was adopted as a tool to collect primary data. The questionnaire was built by researcher through the aid of previous studies - *Content et al (2020); Roundy (2020); Song (2019); Roundy and Bayer (2019) and Volkmann et al (2021)* – and adopted likert five point scale “(1) Strongly Disagree; (2) Disagree; (3) Neither Agree nor Disagree; (4) Agree; (5) Strongly Agree”. The questionnaire consisted of two main sections, the first took into perspective demographics of study sample including (age, qualification and experience); while the other section contained (MIS, Entrepreneurial Ecosystem and Managerial Awareness). It is worth mentioning that the questionnaire was arbitrated by a group of professional academics in the field, after arbitration the questionnaire consisted of (37) statements as in the following table 1.

Table 1. Statements Distribution of Variables

Variable	# of Statements
MIS Dimensions	
Technical	6
Human	6
Behavioral	6
Organizational	6
Entrepreneurial Ecosystems	6
Managerial Awareness	7

All managers and leaders working within organizations operating in the field of manufacturing single-use food packaging in Jordan synthesized the population in current research. The study tool was uploaded online on Google Forms, and the link was sent to the human resource department of the chosen organization. The questionnaire remained online for total of 4 consecutive weeks for the sake of data collection. After application process, researcher was able to withdraw (180) answered questionnaire from the website which formed the convenient sample of the study. When the questionnaires classified, it was see that (147) questionnaires were properly filled and valid for statistical analysis, this indicated (81.6%) response ratio as statistically accepted. The questionnaire of study was based on likert 5-point scale ranging from 1 strongly disagree to 5 strongly agree.

Statistical package for social sciences SPSS/AMOS was chosen to screen and analyze gathered data. Frequency and percentages, mean and standard deviation, and multicollenarity test were used to

analyze data. Cronbach’s Alpha was used to test reliability and consistency of study tool. All variables scored higher than 0.70, which indicated the reliability and consistency of study tool as according to table 2 below:

Table 2. Alpha Value

variable	Alpha value
Technical	0.714
Human	0.81
Behavioral	0.642
Organizational	0.782
ENTREPRENEURIAL ECOSYSTEMS	0.79
Managerial Awareness	0.849

4. Results and Discussion

4.1. Demographics

As it appeared in table 3 below, results of descriptive analysis indicated that most of respondents were within age range (28-33) forming (32.7%). Also, most of respondents held BA degree forming (66%) with an experience of (10-13) forming (32.7%) of total sample.

Table 3. Descriptive Demographics

	f	%
Age		
22-27	26	17.7
28-33	48	32.7
34-39	45	30.6
+40	28	19.0
Qualification		
BA	97	66.0
High studies	50	34.0
Total	147	100.0
Experience		
2-5	18	12.2
6-9	50	34.0
10-13	48	32.7
+14	31	21.1
Total	147	100.0

4.2. Questionnaire Analysis

Mean and standard deviation were calculated for questionnaire in table 4 below. It appeared that all statements scored higher than mean of scale 3.00 which indicated that they were positively received by study sample. The highest variable was (Organizational Dimension) scoring 4.07/5.00 compared to the least – but still positive – variable (Technical Dimension) scoring 3.81/5.00 which was also higher than mean of scale 3.00.

Table 4. Questionnaire Analysis

Statement	Mean	Std. Deviation
Appropriate software is chosen in the organization to achieve the objectives	3.76	.902
Appropriate equipment is employed in order to ensure that objectives are achieved	3.38	1.279
There are networks for data and information to store and ensure easy access	4.01	.832
The organization provides a high level of security and protection for information stored on management information systems	3.97	.947
There is technical support available all the time for the people working on the systems	4.11	.908
Management information systems are integrated with the rest of the systems used in the organization	3.65	1.064
Technical	3.8129	.64103
The organization has all the necessary competencies to work with information systems, and employees are trained in an appropriate scientific and administrative manner.	4.05	.866
There is adequate administrative support for staff to ensure that there is easy access to information in the systems	4.01	.852
The organization has an organizational culture that encourages the use of efficient and effective information systems	4.12	.807
Incentives are employed in the organization to encourage employees to use the systems appropriately and to develop their skills in them	3.99	.906
Communication within the organization is suitable for conducting operations and exchanging information	3.98	.996
There is an identification of the appropriate responsibilities of each individual within the organization for the use of the systems	4.19	1.075
Human	4.0567	.65992
The organization sets the appropriate goals for the administrative systems and directs the work to achieve the desired goals	3.89	1.028
Attention is given to training employees on administrative systems in order to ensure their effective use	4.04	.935
There is an adequate exchange of information between workers within the framework of administrative and informational systems	3.80	.936
The organization monitors administrative and information systems and measures the extent to which goals are achieved	3.63	.870
The organization supports creativity and innovation initiatives in the use of management information systems	3.84	.876
Continuous learning is an integral part of the organization's behavior	3.82	.803
Behavioral	3.8345	.54497
The organizational dimensions of management information systems include a number of important aspects that organizations need to consider. Among these aspects:	4.15	.743
The main and sub-objectives of using management information systems are identified	4.14	.740
There is a clear plan and a clear definition of the administrative responsibilities of the systems	3.97	.943
There is a unit responsible for ensuring the proper implementation of management information systems requirements	4.10	.850
Administrative processes within the systems are implemented in the correct and effective manner	4.09	.819
The level of performance of management information systems is monitored and measured periodically	4.00	.891
Organizational	4.0760	.57743
Management information systems ensure a good level of waste management by tracking and analyzing the amount of waste and pollution	3.99	.899

Management information systems improve the management of natural resources by improving the level of water and energy consumption	3.77	.861
Management information systems ensure a good level of transparency and disclosure about the organizations' performance in environmental terms	3.65	.984
Management information systems contribute to improving communication with stakeholders by providing accurate information from organizational initiatives	3.99	.997
Management information systems improve the management of energy consumption	3.98	.989
Management information systems ensure the social and environmental responsibility of organizations and improve their environmental footprint	3.80	1.120
Entrepreneurial Ecosystem	3.8639	.68358
Management awareness helps improve the relationship between management information systems and entrepreneurial business ecosystems by providing programs and workshops	3.94	1.061
Management awareness determines the future strategic frameworks of the organization in order to operate periodically	3.92	1.037
Administrative awareness understands the principle of sustainability and works to achieve it in every possible way	3.88	1.037
Administrative awareness depends on artificial intelligence and data analysis in measuring the environmental awareness of the organization	3.86	1.066
Administrative awareness is committed to local and international environmental legislation	3.61	1.024
Administrative awareness contributes to the continuity of communication with local, international and regulatory authorities in order to improve the relationship between administrative and environmental systems	3.94	.995
Environmental awareness invests in modern technologies that ensure the most efficient application of management and environmental information systems	3.71	.972
Managerial Awareness	3.8367	.74419

4.3. Multicollinearity test

VIF and Tolerance were calculated for each independent variable to determine whether or not there was multicollinearity between them. According to the statistics in table 5, the VIF values were less than 10, while the Tolerance values were more than 0.10 (Gujarat & Porter, 2009).

Table 5. Multicollinearity

variable	Tolerance	VIF
Technical	.539	1.854
Human	.357	2.801
Behavioral	.376	2.660
Organizational	.696	1.437

4.4. Hypotheses Testing

Table 6 below presented that all of the indicators were within acceptable ranges, as according to studies and sources listed, which indicated that researcher can use the study model's results with confidence and share the study's results in the right way.

Table 6. Fit Model

Indicator	AGFI	$\frac{\chi^2}{df}$	GFI	RMSEA	CFI	NFI
Value Recommended	> 0.8	< 5	> 0.90	≤0.10	> 0.9	> 0.9

References	(Miles and Shevlin, 1998).	(Tabachnick and Fidell, 2007)	(Miles and Shevlin, 1998).	(MacCallum et al, 1996)	(Hu and Bentler, 1999).	(Hu and Bentler, 1999).
Value of Model	0.90	2.217	0.976	0.091	0.989	0.98

			Direct impact	Indirect impact	Total Impact	C.R.	P	Label
Managerial awareness	<---	MIS	0.325		0.325	3.076	.002	accept
entrepreneurial ecosystems	<---	Managerial awareness	0.838		0.838	20.991	***	accept
entrepreneurial ecosystems	<---	MIS	0.16	0.271	0.431	2.893	.004	accept

H1: MIS dimensions have a statistically significant influence on entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

This hypothesis was accepted (C.R. = 2.893; $P < 0.05$; = 0.004). This means that MIS dimensions have a statistically significant influence on entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan.

H2: MIS dimensions have a statistically significant influence on managerial awareness from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

This hypothesis was accepted (C.R. = 3.076; $P < 0.05$; = 0.002). This means that MIS dimensions have a statistically significant influence on managerial awareness from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

H3: Managerial awareness has a statistically significant influence on entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

This hypothesis was accepted (C.R. = 20.991; $P < 0.05$; = 0.000). This means that Managerial awareness has a statistically significant influence on entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

H4: Managerial awareness mediates the relationship between MIS dimensions and entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

This hypothesis was accepted (Indirect impact= 0.271; $P < 0.05$; = 0.004). This means that Managerial awareness mediates the relationship between MIS dimensions and entrepreneurial ecosystems from perspective of managers and leaders in organizations operating in the field of manufacturing single-use food packaging in Jordan

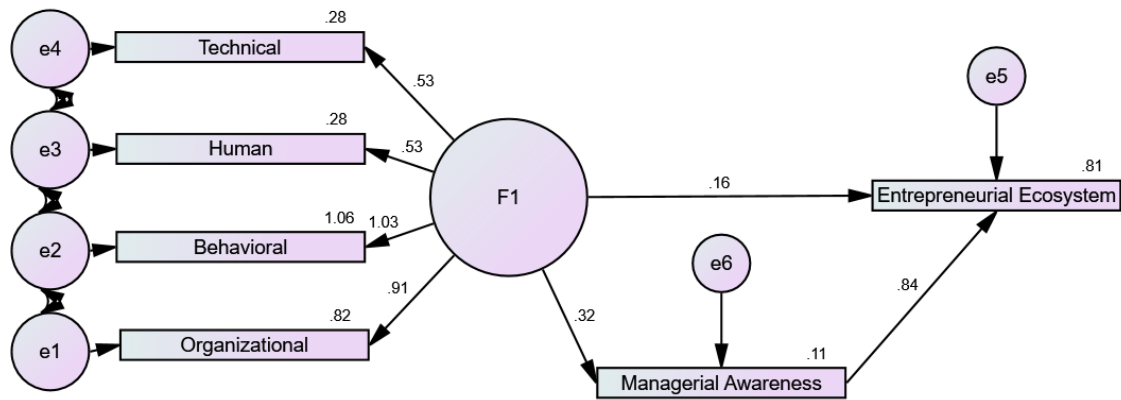


Fig.2: Hypotheses Testing

4.5. Discussion

This research study sought to investigate the mediating influence of managerial awareness on the relationship between management information systems MIS and entrepreneurial ecosystems from perspective of (147) manager and leader from organizations operating in the field of manufacturing single-use food packaging in Jordan. Quantitative methodology was adopted through utilizing a questionnaire. SPSS was used to deal with primary data. Results of analysis indicated the acceptance of all study hypotheses which meant that managerial awareness mediates the relationship between MIS and entrepreneurial ecosystems.

MIS Supports Better Entrepreneurial Ecosystems

Going through the above results, the study proved that management information systems have a positive impact on entrepreneurial ecosystems, as they ensure planning and organization of entrepreneurial projects and provide the necessary information that would assist in decision-making. In addition, management information systems of all kinds ensure proper management of organizational resources. Which leads to sound ecological pioneering projects. The study also proved that management information systems enhance innovation and creativity in entrepreneurial projects based on the provision of data and information that guide ideas and help in developing products and services. This result agreed with Bischoff (2021) and Cetindamar et al (2020) when they indicated that management information systems would improve effective communication between workers, managers and leaders within entrepreneurial projects, and thus provide databases that guide decision-making processes.

MIS Can Better Orient Managerial Awareness

The hypothesis that management information systems support managerial awareness has been accepted through the above results. As management information systems have an active role in converting data into useful information, which is employed in reports that help management to understand and analyze. Also, management information systems improve management effectiveness by supporting strategic and planning operations and developing the foundations of monitoring and evaluation, thus increasing the organization's ability to make effective decisions and identifying opportunities and threats that may face the organization. These results agreed with Content et al (2020) and Roundy (2020) who confirmed that management information systems enhance innovation and creativity in entrepreneurial projects and show aspects of development and improvement, which leads to management that is more aware of market requirements.

Aware Management Means Better Entrepreneurial Ecosystems

Combining the two previous hypotheses; it can be said that aware management supports entrepreneurial ecosystems by focusing on innovation and creativity, and improving the foundations of effective communication, which in turn ensures an effective exchange of information between working

parties within the organization, in addition to effective communication between the organization and its external environment. It was also found through the analysis that management awareness is sufficient to direct the organization towards improving agility and productivity based on the adoption of effective practices that improve production processes, adopt the right strategies, and improve the performance of the organization in general. Such result agreed with Song (2019); Roundy and Bayer (2019) and Volkmann et al (2021).

The main hypothesis of the study argued “managerial awareness mediates the relationship between MIS and entrepreneurial ecosystems”. Results of study accepted the hypothesis with all its means as it appeared that aware management can determine the nature of the organization's needs that it expects from management information systems, and thus manage operations in a way that saves time and effort and guarantees the best performance results. In addition, mediating managerial awareness of the relationship between management information systems and environmental systems for entrepreneurial projects depends on data analysis, which in turn contributes to improving environmental performance and providing key and effective indicators in the possibility of reaching the goals set within the entrepreneurial project strategy. The role of management awareness in improving the relationship between management information systems and environmental systems for entrepreneurial projects cannot be denied by increasing management awareness of the importance of effective communication and realizing the importance of adopting the application of appropriate environmental measures.

From a practical perspective, the study can help to understand the nature of the relationship between the variables (MIS, Management awareness and entrepreneurial ecosystems) in order to develop a set of effective strategies capable of managing entrepreneurial projects based on specific guidance for decision-making. In addition to providing the necessary support in order to help managers and stakeholders to adopt training and assistance programs to support entrepreneurship.

From the theoretical perspective, the study may contribute to explaining the mediating effect of management awareness in strengthening the relationship between management information systems and entrepreneurial ecosystems, and standing on the development of a theory of the mechanisms through which the relationship between administrative parameter systems and ecosystems of entrepreneurial projects can be developed.

5. Conclusion

5.1. General Conclusion

The study proved, through its results, that management information systems (MIS) have an effective role in directing decision-making towards the interest of the organization by reducing costs and focusing on improving the efficiency of organizational operations and improving operations. Mediating the role of management awareness by directing the organization's attention towards the information that data is analyzed based on management information systems and the mechanism of its employment in strengthening entrepreneurial ecosystems and thus improving the overall performance of the organization. As a total conclusion, it can be said that management aware of the environmental systems of entrepreneurial projects and the mechanism of linking them with MIS is able to understand the importance of improving the outputs of administrative work and adopt the foundations of innovation and strategic analysis to be used effectively in the organization. The current study may contribute into orienting the higher management into focusing more on aspects that may increase interest of working staff towards employing technology in supporting ecosystem aspects. In addition, current study may help higher management into realizing their undeniable effect in sustainability in practices as simple as showing more awareness or increased interest.

5.2. Recommendations

From study discussion and conclusion, researcher recommended the following:

- The need to develop a unified scale for evaluating the entrepreneurial ecosystem to better understand and develop this phenomenon.
- The need for effective cooperation and communication with all concerned parties to achieve managerial goals.
- The need to support efforts to improve managers' and leaders' awareness of management information systems and their potential impact on entrepreneurial ecosystems.

5.3. Future Studies

Current study was limited to managers and leadership working within organizations operating in the field of manufacturing single-use food packaging in Jordan. The main focus was on organization of Jordanian nationality, and foreign and multinational organizations weren't taken into consideration of this study. From conclusion and results of study, researcher suggested the following future studies:

1. Examine the impact of artificial intelligence (AI) on entrepreneurial ecosystems and identify aspects of AI that are most effective in supporting entrepreneurship and why.
2. Investigate the role organizational culture or leadership style on the performance of entrepreneurial ecosystems.
3. Examine the relationship between types of entrepreneurial projects and management information systems like small business startups, social enterprise, and corporate entrepreneurship projects

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