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Transforming into Entrepreneurial Universities: EU-OECD as a Framework for Saudi Universities

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Abstract

The purpose of this study is to suggest a paradigm that will help Saudi universities, particularly emerging ones, transform into entrepreneurial universities in light of the EU-OECD framework. A quantitative research design was employed to collect data from academic leaders at four public Saudi universities. A total of 331 academic leaders participated in the study. A stratified random sampling method was utilized to stratify the sample based on university type, namely established universities or emerging universities. According to academic leaders' perceptions, entrepreneurship at Saudi universities reached a moderate level in light of the EU-OECD framework. The highest-rated dimension of entrepreneurial universities was Organizational Capacity, People, and Incentives. Other dimensions reached a moderate level, including Pathways for Entrepreneurs, followed by Leadership and Governance, University–Business/External Relationships for Knowledge Exchange, The Entrepreneurial University as an Internationalized Institution, Entrepreneurship Development in Teaching and Learning, and Measuring the Impact of the Entrepreneurial University. No statistically significant differences ($\alpha = 0.05$) were found in the average perceptions of academic leaders that can be attributed to gender, occupation, or leadership experiences in higher education in general. Nevertheless, there were statistically significant differences that can be attributed to university type in favor of established universities. A suggested paradigm to help Saudi universities transform into entrepreneurial universities is developed in light of the EU-OECD framework. Finally, based on the study findings, several recommendations are provided for Saudi universities to transform into entrepreneurial universities.

Keywords: *Entrepreneurial Universities; Saudi Universities; Academic leaders; EU-OECD Framework.*

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Introduction

"My first objective is for our country to be a pioneering and successful global model of excellence, on all fronts, and I will work with you to achieve that" (King Salman bin Abdulaziz Al Saud, 2016).

The entrepreneurial spirit is the driving force for economic and social expansion and thus being an entrepreneurial country requires creating entrepreneurial universities as higher education is a key component of a nation's progress (Hofer, & Potter, 2010; Milter, 2015). The Ministry of Education in Saudi Arabia has recognized the need to adapt to a rapidly changing environment to maintain their relevance and effectiveness in equipping students with the knowledge and skills they need to have a positive impact on the world. Thus, in 2019, a new system for Saudi universities that included some significant features was announced. Among these features are providing disciplined independence to universities, finding new funding sources and reducing dependence on the government budget, and applying the principles of privatization to the management and operation of higher education institutions (Ministry of Education, 2020a). Therefore, leaders at Saudi universities must act rapidly and effectively to achieve global entrepreneurship. Higher education institutions need to evaluate their operational strategies and become engineers of innovation and transformation to respond to the external forces driving change, all of which requires entrepreneurial leaders (Utash, 2017). The entrepreneurial university represents a response to the challenges faced by higher education institutions as they seek to discover ways to adapt to new trends (EC-OECD, 2012).

Numerous studies have confirmed that universities play a critical role in countries' entrepreneurship as well as the development of knowledge-based economies (Audretsch, 2014; Bronstein & Reihlen, 2014; Clark, 1998; EC & OECD, 2012; Guerrero et al., 2011; Markuerkiaga et al., 2014; Rothaermel et al., 2007; Salamzadeh et al., 2011). In this case, universities are required to act more entrepreneurially in their activities, marketing their research outcomes and establishing new knowledge-based enterprises (Guerrero-Cano, Kirby & Urbano, 2006). Universities in both developed or developing countries are looking forward to becoming entrepreneurial universities and being highly ranked internationally; this requires significant effort and intensive work. Universities are under pressure from the public to facilitate access to higher education as well as pressure from the government to contribute to their countries' economic and social development (Peterka & Salihovic, 2008; Smith, 2007). However, remaining in the status quo will not meet the growing demands of society and government. The conventional university focuses on two functions, teaching and research, while the entrepreneurial university, in addition to the above, focuses on the commercialization of new knowledge for economic development (Etzkowitz et al., 2000; Fernández-Nogueira et al., 2018; Perkmann et al., 2013). Teaching, research, and business activities cannot be separated, so universities must integrate them to achieve long-term sustainability (Etzkowitz et al., 2000). In the same context, Arnaut (2010) and Fernández-Nogueira et al. (2018) emphasized that the integration of economic and social development with the mission of a university can help transfer it from a traditional university focused on teaching and research to an entrepreneurial university. Thus, transformation to an entrepreneurial university has become an obsession among universities, as regular universities can no longer satisfy the increasing needs of society (Fernández-Nogueira et al., 2018; Guerrero, Cunningham, & Urbano, 2015; Gordon, Hamilton, & Jack, 2012; Johnstone & Huggins, 2016; Larty, Jack, & Lockett, 2016).

Notwithstanding the resistance of some critics to entrepreneurialism in the context of higher education, Etzkowitz et al., (2000) argued that transformation into an entrepreneurial university will help develop regional or national economic performance and improve university funding as well as its faculty. It should be noted that the transition to a leading university does not mean a

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university should abandon its research mission but that research and other activities should serve as capital for the university (Blenker et al. 2006).

Saudi Vision 2030 includes a considerable focus on transformation from an oil-based economy to a knowledge-based economy. In this sense, Saudi universities, particularly emerging ones, should work hard to transform themselves into entrepreneurial universities, which is in line with Saudi Vision 2030 that includes the goal to be a pioneer country in various fields. Turning to such universities requires adopting the approach of the "Triple Helix", which involves enhancing cooperation among three sectors (university-industry-government) to support innovation and a knowledge-based economy (Etzkowitz, 2006). This transformation will be a driving force for increasing innovation and technology as well as the Kingdom's economic growth, which will, in turn, enhance its global competitiveness. The Saudi Ministry of Education launched an ambitious project entitled "Global Entrepreneurship Program at Saudi Universities" that includes methods of developing high-quality higher education institutions to achieve global entrepreneurship in various fields and specialties (Ministry of Education, 2020b).

Despite the enormous advantages of transforming universities using entrepreneurial ideals, this path is not always smooth and the process is not always straightforward. It requires creating entrepreneurial leaders, establishing infrastructure, creating strategic plans, and drawing on the expertise of developed countries. Indeed, there may be internal resistance from faculty, for instance, on the route to transforming a university (Kalar & Antoncic, 2015). While the social and economic benefits of entrepreneurial universities are apparent, the systems of universities must change drastically to allow such a transition (Etkowitz, 2016). Despite these potential restrictions, it is evident that moving university structures at least partially towards entrepreneurial educational models will be advantageous for universities, individuals, and national economies on all fronts (Eisenberg et al., 2019). Leading universities in Europe, such as IE in Madrid, Imperial College in London, and American institutions such as Stanford University, have led the way in demonstrating how such a model can be efficiently and effectively implemented. As a result, universities in developing countries should take advantage of the valuable lessons offered by such leaders in innovation and benefit from their experiences, which can be used as a guiding framework. For instance, EU-OECD, a framework for ambitious universities that are seeking to be entrepreneurial and reach high rank (OECD, 2012), is adopted in the current study.

Purpose of the Study

The purpose of the current study is to suggest a paradigm that will help Saudi universities, particularly emerging ones, transform into entrepreneurial universities in light of the EU-OECD framework.

Research Problem

The concept of the entrepreneurial university is a relatively recent one (He, Standen, & Coetzer, 2017; Leitch, & Volery, 2017), particularly in developing countries. The concept emphasizes the need to transform the traditional research university model into an entrepreneurial university model (Al-Shammari, 2018). Many famous entrepreneurs such as Steve Jobs and Bill Gates dropped out of their universities, which may indicate that traditional universities are not an appropriate place for innovative students to build their brand and obtain the required skills to succeed in a rapidly changing world.

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The emergence of a knowledge-based economy, the communication and information technology revolution, and various economic changes make it imperative for higher education institutions, not only in Saudi Arabia but also globally, to shift from traditional universities to entrepreneurial universities. This will enable higher education institutions to cope with volatile circumstances (Etzkowitz et al., 2000; Fernández-Nogueira et al., 2018; Lazzeretti and Tavoletti, 2005). Recently, several universities have adopted entrepreneurial education methods in their strategic plana. New Business Insider rankings indicate that several global programs are turning their focus to entrepreneurial teaching and learning approaches (Kiersz, 2019). Many of these programs promote entrepreneurship and innovation, and yet they represent a certain elite in developed countries. As such, extending the scope of the traditional university to include entrepreneurship becomes an obvious requirement for international universities, particularly those in developing countries.

Saudi Vision 2030's main focus is on the development of a knowledge-based economy through optimal investment in human capital, which in turn will create new scientific ideas and innovations that will allow the Kingdom to be a pioneering country in various fields. Saudi Vision 2030 sets a goal for at least five Saudi universities to be among the top 200 international universities globally by 2030 (Saudi Vision 2030). However, retaining the status quo will prevent universities from competing and contributing to economic development and thus the transition of universities to entrepreneurial universities will play a significant role in achieving the vision to create leading universities globally (Sultan, 2017).

Despite the focus of Saudi Vision 2030 on promoting entrepreneurship and establishing several innovation and entrepreneurship centers at Saudi universities that embrace various entrepreneurial activities, it lacks clear plans for the transformation of Saudi universities, especially emerging ones, into entrepreneurial universities. Moreover, there is a lack of research on the transition of Saudi universities to entrepreneurial universities. Hence, there is a need to develop entrepreneurial universities that can keep up with various developments and contribute to the development of the country's economy to achieve this ambitious vision. Additionally, taking advantage of developed countries' experiences in the field of entrepreneurship is commensurate with the environment of Saudi universities. Therefore, the current study develops a suggested paradigm for Saudi universities to transform into entrepreneurial universities in light of the EU-OECD framework.

Research Questions

The main research question addressed by the current study is: *RQ:* What is a suggested paradigm to assist Saudi universities in their transformation into entrepreneurial universities in light of the EU-OECD framework?

A number of the sub-questions stem from this main question:

RQ1: What is the level of entrepreneurship at Saudi universities in the light of the EU-OECD framework from academic leaders' perceptions?
RQ2: What is the level of entrepreneurship at established Saudi universities in the light of the EU-OECD framework from academic leaders' perceptions?
RQ3: What is the level of entrepreneurship at emerging Saudi universities in the light of the EU-OECD framework from the academic leaders' perceptions?
RQ4: Is there a statistically significant difference ($\alpha = 0.05$) among academic leaders' perceptions regarding the level of entrepreneurship at Saudi universities that can be attributed to the study variables (gender, university type, occupation, and leadership experience in higher education)?

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Significance of the Study

The results of this study can assist leaders at both established and emerging Saudi universities with having a better understanding of the entrepreneurial university concept. It is also anticipated that the study results will help leaders at Saudi universities understand the current entrepreneurship situation and support transformation into entrepreneurial universities following the suggested paradigm. Additionally, this study is valuable as it is one of the first attempts to study Saudi universities' process of transforming into entrepreneurial universities and can help pave the way for researchers in the field of entrepreneurial university transformation in Saudi Arabia.

Literature Review

The Concept of the Entrepreneurial University

Transformation into an entrepreneurial university requires an understanding of the concept by all stakeholders. Numerous definitions have emerged and vary regarding the concept of the entrepreneurial university, and there is no standard definition agreed upon by scholars. Etzkowitz (1983) defined entrepreneurial universities as those "that are considering new sources of funds like patents, research under by contracts and entry into a partnership with a private enterprise." Chrisman et al. (1995) mentioned that the entrepreneurial university is "the creation of new business ventures by university professors, technicians, or students."

Clark (1998) described the entrepreneurial university as an innovative university. Through these definitions, it is clear that scholars have focused on new production and innovation to achieve the mission of the entrepreneurial university and meet the growing demands of the public. Clark (1998) emphasized that the entrepreneurial university is one that can rely on itself and develop itself; in other words, it is a stand-up university.

Some authors have stressed the point that transformation must involve all parties (i.e., students, employees, and faculty) while others have emphasized adopting the "Triple Helix", which describes the relationship among university, industry, and government, to define the entrepreneurial university. For instance, Kirby et al., (2011) indicated that an entrepreneurial university is "a natural incubator that endeavors to simultaneously fulfill its missions (teaching, research, and entrepreneurial activities) while providing an adequate atmosphere in which the university community (academics, students and staff) can identify, explore, and exploit innovative and creative ideas that could be transformed into new ventures".

The entrepreneurial university seeks to achieve its mission by incubating entrepreneurial initiatives for all stakeholders (i.e., students, academics, faculty members, and employees) (Guerrero-Cano et al., 2006). Arnaut (2010) and Etzkowitz (2006) highlighted that the entrepreneurial university integrates economic and social development as a third mission, along with teaching and research. Likewise, Etzkowitz (2006) focused on the "Triple Helix" and the promotion of space for innovation based on the knowledge economy to create an entrepreneurial university. It can be said that a university is entrepreneurial when it is free from fears of the commercialization of its ideas and is not considered contrary to academic values, which allows it to create value in the community (Clark, 2004).

According to the outlined literature, the current study defines the entrepreneurial university as one that leads in a pioneering manner, is characterized by innovation and risk-taking, and adds value to

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its community by contributing to economic development through the promotion of a knowledge-based economy. An entrepreneurial university leads in a pioneering way to produce non-traditional funding sources, is distinguished from other universities, adds value to its community, and helps reduce unemployment and create jobs for its alumni. This diversity of views and definitions of the entrepreneurial university concept (OECD, 2012) calls for a framework for the entrepreneurial university that supports the many existing definitions.

EU-OECD "HEInnovate" Entrepreneurial University Framework

Although there is no agreement by researchers on the precise concept and characteristics of the entrepreneurial university, there have been some attempts and models that can be utilized for guidance. Therefore, Saudi universities seeking innovation and excellence and aspiring to global entrepreneurship can take advantage of existing models and best practices to become entrepreneurial universities. The EU-OECD "HEInnovate" Entrepreneurial University Framework is one of the models that can be used by universities seeking innovation and excellence at all levels and an entrepreneurial rank (OECD, 2012). This framework was produced in cooperation with the European Commission and the OECD and is recommended by a panel of six independent experts in the entrepreneurial university field. It consists of seven dimensions, which are (OECD, 2012):

- Leadership and Governance.
- Organizational Capacity, People, and Incentives.
- Entrepreneurship Development in Teaching and Learning.
- Pathways for Entrepreneurs.
- University – Business/External Relationships for Knowledge Exchange.
- The Entrepreneurial University as an Internationalized Institution.
- Measuring the Impact of the Entrepreneurial University.

These dimensions are likely to be features of an entrepreneurial university, and each contains a series of items (OECD, 2012). This framework can assist Saudi universities with gaining a greater understanding of the entrepreneurial university concept along with its different dimensions, assess the current situation, and identify and address strengths and weaknesses while taking into consideration what is suitable for the local environment (OECD, 2012).

Pathways to Transformation into an Entrepreneurial University

Currently, several universities embody in their mission statements the words "enterprise" and "entrepreneurship". However, these terms need to be more than a reference (OECD, 2012). The transition from traditional university into an entrepreneurial one is not smooth; it requires considerable strategies and processes. By reviewing the theoretical literature in addition to the EU-OECD "HEInnovate" Entrepreneurial University Framework, scholars have provided many pathways for universities to achieve entrepreneurship status, as shown in Table 1.

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Table 1
Pathways to transformation into an entrepreneurial university

Author	Pathways/ Framework
Clark (1998a)	- Establishing a core steering committee. - Extending the development periphery. - Diversifying the funding base. - Stimulating the academic heartland. - Spreading an entrepreneurial culture.
Etzkowitz (2004)	- Capitalizing on knowledge. - Managing interdependence with industry and government. - Establishing the autonomy of a particular field. - Managing hybridization in the tension between independence and interdependence. - Embodying reflexivity through the continuous renewal of internal structures.
Clark, 2004	- Diversifying university self-financing. - Promoting steering capacity. - Increasing the development field. - Encouraging academic spirit. - Creating an entrepreneurial culture.
Schulte, 2004	- Focusing on job creation instead of job seeking. - Developing specialized leadership. - Depending on research outcomes as a source for socio-economic innovation.
Gibb, Haskins & Robertson (2009)	- Maximizing independence and individual patent initiatives. - Uniting by shared values/mission and not specific control systems. - Incentivizing innovation and learning from mistakes. - Providing extensive opportunities for holistic project management. - Organizing a reward system for success with customers and to create stakeholder credibility. - Implementing flexible strategic thinking instead of formal planning. - Encouraging and rewarding learning by doing. - Supporting overlapping and informal integration inside and outside the organization. - Delegating responsibility to see things through. - Encouraging staff to develop external relationships.
Al-Shammari (2010)	- Focusing on creating jobs rather than on employment. - Building partnerships with stakeholders from the public and private sectors as well as alumni. - Transferring technology and knowledge through close contact with outstanding Western and Eastern universities in the field of entrepreneurship. - Implementing education based on creativity and innovation. - Providing capable leadership for the material and moral potential of entrepreneurs.
OECD (2012)	- Leadership and Governance - Organizational Capacity, People, and Incentives - Entrepreneurship Development in Teaching and Learning - Pathways for Entrepreneurs - University–Business/External Relationships for Knowledge Exchange - The Entrepreneurial University as an Internationalized Institution - Measuring the Impact of the Entrepreneurial University.

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Methodology

The current study used a quantitative research method to analyze the levels of entrepreneurship at Saudi universities. Since no previous study has examined the transformation of Saudi universities into entrepreneurial universities in light of the EU-OECD "HEInnovate" Entrepreneurial University Framework, a survey designed by EU-OECD was adopted for this study. A pilot study was conducted to measure the survey's reliability and validity as well. The online survey was sent to leaders (i.e., Deans, Vice Deans, Department Chairs, and Vice Department Chairs) at two established universities and two emerging universities in Saudi Arabia.

Study Sample

The study population consisted of all academic leaders at four Saudi universities, two of which were established universities and two emerging universities. In this study, an established university and an emerging university were intentionally selected from the same region so that the entrepreneurial opportunities were approximately equal among both samples. A stratified random sampling method was used to select the respondents from each university, according to the university type. The suitable sample size for the target population was 331 individuals, based on Krejcie and Morgan's (1970) table for determining sample size.

Characteristics of the Study Sample

The current study examined the characteristics of its sample population by identifying demographic variables such as gender, university type, occupation, and leadership experience in higher education, as illustrated in Table 1.

Table 1
Characteristics of the study sample.

Variable	Category/ Characteristics	No.	%
Gender	Male	215	65%
	Female	116	35%
University Type	Established University	193	58%
	Emerging University	138	42%
Occupation	Dean	4	1%
	Vice Dean	75	23%
	Department Chair	181	55%
	Vice Department Chair	71	21%
Leadership Experience in HE	Less than 5 years	114	34%
	From 5 years to 10 years	159	48%
	More than 10 years	58	18%

The Study Instrument

A survey from the OECD Entrepreneurial University Framework was adapted and utilized to answer the present study's research questions. The purpose of the adapted survey was to collect data to provide a paradigm to help Saudi universities—particularly emerging ones—transform into entrepreneurial universities in light of the EU-OECD "HEInnovate" framework. To ensure the

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stability and accuracy of translation from English to Arabic, a back-translation procedure was performed. A panel of bilingual professors translated the questionnaire from English to Arabic, since Arabic was the native language of all participants. Other bilingual professors then translated the survey back into English without viewing the original version. The questionnaire addressed seven main dimensions: leadership and governance; organizational capacity, people, and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university and business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university. The questionnaire had 41 items and utilized a six-point Likert scale. The answer options ranged from strongly agree to strongly disagree, with no neutral point.

The perceptions of academic leaders at Saudi universities regarding the level of entrepreneurship at their universities were quantified and divided into three levels using statistical methods. The levels of entrepreneurship were categorized as low, moderate, and high, with scores of 1.00 to <2.68, 2.68 to <4.36, and 4.36 to 6.00, respectively.

Validity and Reliability

A pilot study was conducted with a sample of 30 respondents to measure the validity and reliability of the instrument. The respondents from the pilot study were not included in the actual study's sample. The instrument had a large Cronbach's alpha of 0.846, and the seven main dimensions had acceptable reliabilities of 0.924, 0.728, 0.721, 0.758, 0.676, 0.642, and 0.714, respectively.

To measure the items' validities, the Pearson correlation coefficient was determined for each item in the pilot study within its dimension, as well as for the total questionnaire scores within each dimension. As shown in Table 2, the item correlation scores ranged from .315* to .896**, and most correlations were significant at $p < 0.01$. Similarly, Table 3 shows the correlation coefficients for the total scores in each dimension, which ranged from .317* to .705**, and most were significant at $p < 0.01$.

Table 2
Pearson correlation coefficients for each item within each dimension.

Dimension 1		Dimension 2		Dimension 3		Dimension 4		Dimension 5		Dimension 6		Dimension 7	
N	R	N	R	N	R	N	R	N	R	N	R	N	R
1	.725**	6	.766**	13	.345*	19	.837**	26	.706**	32	.792**	37	.802**
2	.851**	7	.635**	14	.878**	20	.315*	27	.701**	33	.355*	38	.642**
3	.887**	8	.739**	15	.396**	21	.833**	28	.597**	34	.742**	39	.808**
4	.862**	9	.336**	16	.841**	22	.348*	29	.537*	35	.859**	40	.483**
5	.852**	10	.395**	17	.878**	23	.896**	30	.656**	36	.529**	41	.690**
		11	.801**	18	.411**	24	.880**	31	.561**				
		12	.652**			25	.387*						

Table 3
Pearson correlation coefficients for the total scores in each dimension.

Dimension 1		Dimension 2		Dimension 3		Dimension 4		Dimension 5		Dimension 6		Dimension 7	
R	.615**	R	.694**	R	.317*	R	.515**	R	.516**	R	.705**	R	.532**

** Correlation is significant at $p < 0.01$ (2-tailed).
* Correlation is significant at $p < 0.05$ (2-tailed).

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Results and Discussion

The current study investigated the levels of entrepreneurship at both established and emerging Saudi universities in light of the EU-OECD framework to provide a paradigm for transformation into entrepreneurial universities. Overall, the level of entrepreneurship reported by the academic leaders was moderate at the universities studied. Notably, the level of entrepreneurship at the established Saudi universities was higher than at the emerging universities. This is likely because emerging universities are newly established, and their entrepreneurial practices do not yet rival established universities.

The survey items for this study were analyzed using the Statistical Package for the Social Sciences (SPSS) program. A t-test, Kruskal-Wallis test, and Mann-Whitney test were used to determine whether any differences among the academic leaders' perceptions of entrepreneurship levels could be attributed to demographic variables (i.e., gender, university type, occupation, and experience as an academic leader in higher education).

Results Related to Entrepreneurship Level

The overall means (*M*) and standard deviations (*SD*) were calculated for the total scores as well as for each item and dimension. The entrepreneurship level at Saudi universities was determined within seven dimension subscales titled (1) Leadership and Governance; (2) Organizational Capacity, People, and Incentives; (3) Entrepreneurship Development in Teaching and Learning; (4) Pathways for Entrepreneurs; (5) University and Business/External Relationships for Knowledge Exchange; (6) The Entrepreneurial University as an Internationalized Institution; and (7) Measuring the Impact of the Entrepreneurial University. Table 4 demonstrates the descriptive statistics for the seven dimensions of entrepreneurial universities and the overall score for the level of entrepreneurship at Saudi universities as a whole in light of the EU-OECD framework, based on academic leaders' perceptions.

Table 4
Descriptive statistics for academic leaders' perceptions of the level of entrepreneurship at Saudi universities overall and within the subscales (N = 331).

Dimensions of Entrepreneurial Universities	***M***	***SD***	**Level**
Leadership and Governance	3.94	.35	Moderate level 3
Organizational Capacity, People, and Incentives	4.38	.47	High level 1
Entrepreneurship Development in Teaching and Learning	3.29	.42	Moderate level 6
Pathways for Entrepreneurs	4.15	.35	Moderate level 2
University and Business/External Relationships for Knowledge Exchange	3.84	.41	Moderate level 4
The Entrepreneurial University as an Internationalized Institution	3.37	.40	Moderate level 5
Measuring the Impact of the Entrepreneurial University	3.10	.47	Moderate level 7
Overall	3.72	.26	Moderate level

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As shown in Table 4, the overall score for the level of entrepreneurship at Saudi universities in light of the OECD framework, based on the academic leaders' perceptions, was 3.72, with a standard deviation of 0.26. This score indicates a moderate level of entrepreneurship at Saudi universities. The highest-rated dimension of entrepreneurial universities was Organizational Capacity, People, and Incentives (M = 4.38, SD = 0.47), which reached a high level. All remaining dimensions scored at a moderate level.

The results of the current study are consistent with those of previous studies (e.g., Sultan, 2017; Iglesias-Sánchez, Jambrino-Maldonado, Velasco, & Kokash, 2016), which also found moderate levels of entrepreneurship at different universities. The reason for this consistency in entrepreneurship levels is likely due to perceived risks, and the notion of arguing entrepreneurial abilities hinder people from starting an entrepreneurial venture. Hunady, Orviska, and Pisar (2018) stated that since universities are aware of this problem, they are on track to support the practice of starting businesses. Furthermore, universities could focus on commercializing some of the innovations that students develop in these institutions' business incubators. This prior study highlighted the vital function that universities play in training entrepreneurial minds. Din, Anuar, and Usman (2016), while recognizing the low levels of entrepreneurship, attempted to demonstrate how higher levels of entrepreneurship education influence employment, earnings, and satisfaction. Their study recommended higher-level training and support of entrepreneurship in higher education institutions to drive the establishment of new ventures.

As already stated, the academic leaders surveyed in the present study reported moderate levels of entrepreneurship at Saudi universities in light of the EU-OECD framework. However, academics from both established and emerging universities were studied. Established universities are those that have existed for a long time, whereas emerging universities were recently founded. Tables 5 and 6 contain the descriptive statistics from the survey results regarding the level of entrepreneurship at established and emerging universities, respectively.

Table 5
Descriptive statistics for academic leaders' perceptions of the level of entrepreneurship at established Saudi universities overall and within the subscales (N = 331).

Dimensions of Entrepreneurial Universities	*M*	*SD*	Level
Leadership and Governance	3.94	.34	Moderate level
Organizational Capacity, People, and Incentives	4.66	.40	High level
Entrepreneurship Development in Teaching and Learning	3.29	.43	Moderate level
Pathways for Entrepreneurs	4.24	.39	Moderate level
University and Business/External Relationships for Knowledge Exchange	3.83	.42	Moderate level
The Entrepreneurial University as an Internationalized Institution	3.36	.41	Moderate level
Measuring the Impact of the Entrepreneurial University	3.14	.46	Moderate level
Overall	3.78	.30	Moderate level

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Table 6
Descriptive statistics for academic leaders' perceptions of the level of entrepreneurship at emerging Saudi universities overall and within the subscales (N = 331).

Dimensions of Entrepreneurial Universities	*M*	*SD*	Level
Leadership and Governance	3.93	.38	Moderate level
Organizational Capacity, People, and Incentives	3.99	.21	Moderate level
Entrepreneurship Development in Teaching and Learning	3.29	.42	Moderate level
Pathways for Entrepreneurs	4.03	.26	Moderate level
University and Business/External Relationships for Knowledge Exchange	3.85	.40	Moderate level
The Entrepreneurial University as an Internationalized Institution	3.38	.39	Moderate level
Measuring the Impact of the Entrepreneurial University	3.04	.48	Moderate level
Overall	3.64	.17	Moderate level

As shown in Tables 5 and 6, the level of entrepreneurship at established and emerging Saudi universities was scored at a moderate level, with scores of $M = 3.78$, $SD = 0.30$ and $M = 3.64$, $SD = 0.17$, respectively. The dimension of Organizational Capacity, People, and Incentives obtained the highest level among established Saudi universities, which could be attributed to the fact that these universities were established a long time ago and have received significant financial support from the government. Furthermore, these universities are primarily concentrated in the main economic cities in the Kingdom of Saudi Arabia. All other dimensions scored at a moderate level for both established and emerging universities.

Results Related to the Statistically Significant Differences among Study Sample Responses According to Demographic Variables

A t-test was used to determine whether there was a significant difference ($\alpha = 0.05$) regarding the reported level of entrepreneurship among academic leaders at Saudi universities that could be attributed to gender or university type. Similarly, a Kruskal-Wallis test and Mann-Whitney test were performed to determine whether there was a difference in responses linked to occupation or leadership experience in higher education.

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Table 7
T-test results of the differences between the mean responses of academic leaders by gender.

Dimensions of Entrepreneurial Universities	Group	N	M	SD	t	Sig. (2-tailed)
Leadership and Governance	Male	215	3.93	0.35	-.378	.706
	Female	116	3.95	0.35		
Organizational Capacity, People, and Incentives	Male	215	4.42	0.47	1.896	.059
	Female	116	4.32	0.45		
Entrepreneurship Development in Teaching and Learning	Male	215	3.26	0.44	-2.064	.040
	Female	116	3.35	0.38		
Pathways for Entrepreneurs	Male	215	4.17	0.37	1.566	.118
	Female	116	4.11	0.33		
University and Business/External Relationships for Knowledge Exchange	Male	215	3.81	0.40	-1.512	.131
	Female	116	3.88	0.43		
The Entrepreneurial University as an Internationalized Institution	Male	215	3.34	0.40	-1.421	.156
	Female	116	3.41	0.40		
Measuring the Impact of the Entrepreneurial University.	Male	215	3.07	0.49	-1.496	.136
	Female	116	3.15	0.44		
Overall	Male	215	3.71	0.24	-.780	.461
	Female	116	3.74	0.29		

An independent-samples t-test was used to determine whether there were significant differences in the average perceptions between male academic leaders and female academic leaders regarding the level of entrepreneurship at Saudi universities. As shown in Table 7, there was no significant difference between the scores of male academic leaders (M = 3.71, SD = 0.24) and female academic leaders (M = 3.74, SD = 0.29), t (329) = -.780, p = 0.461. These results are consistent with the findings of Adachi and Hisada (2017), who observed that both men and women are equally likely to start new businesses.

Moreover, no statistically significant differences were observed among the five dimensions of Leadership and Governance, Pathways for Entrepreneurs, University and Business/External Relationships for Knowledge Exchange, The Entrepreneurial University as an Internationalized Institution, and Measuring the Impact of the Entrepreneurial University. However, there was a noticeable difference in the dimension of Organizational Capacity, People, and Incentives between the average perceptions of male academic leaders (M = 4.42, SD = 0.47) and female academic leaders (M = 4.32, SD = 0.45), t (1.896) = 0.059, p = 0.05, in favor of male respondents. This could be attributed to men's orientation to the job market earlier than women. There was also a difference between men's (M = 3.26, SD = 0.44) and women's responses (M = 3.35, SD = 0.38), t (-2.064) = .040, p < 0.05 in the dimension of Entrepreneurship Development in Teaching and Learning, in favor of female respondents. This, in turn, may be due to the fact that more women are interested in the field of education. A study by Chowdhury, Endres, and Frye (2019) found that gender variations were mainly influenced by the three fields of education, experience, and knowledge. Kanze, Huang, Conley, and Higgins (2018) found that differences arose based on access to funding

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since men are expected to be more successful in business than women. Daoud (2018) emphasized that both genders are able to invest in entrepreneurship, yet differences exist due to traditional roles and experiences. Bengtsson, Sanandaji, and Johannesson (2017) stressed the need to focus on three areas in which differences may arise between men and women, including the key characteristics of entrepreneurs, performance attributes of entrepreneurial companies, and the role of financial capital.

Table 8
T-test results of the differences between the mean responses of academic leaders by university type.

Dimensions of Entrepreneurial Universities	Group	N	M	SD	t	Sig. (2-tailed)
Leadership and Governance	Established Universities	193	3.94	0.34	.247	.805
	Emerging Universities	138	3.93	0.38		
Organizational Capacity, People, and Incentives	Established Universities	193	4.66	0.40	19.262	.000
	Emerging Universities	138	3.99	0.21		
Entrepreneurship Development in Teaching and Learning	Established Universities	193	3.29	0.43	-.062	.950
	Emerging Universities	138	3.29	0.42		
Pathways for Entrepreneurs	Established Universities	193	4.24	0.39	5.851	.000
	Emerging Universities	138	4.03	0.26		
University and Business/External Relationships for Knowledge Exchange	Established Universities	193	3.83	0.42	-.379	.705
	Emerging Universities	138	3.85	0.40		
The Entrepreneurial University as an Internationalized Institution	Established Universities	193	3.36	0.41	-.387	.699
	Emerging Universities	138	3.38	0.39		
Measuring the Impact of the Entrepreneurial University	Established Universities	193	3.14	0.46	1.940	.053
	Emerging Universities	138	3.04	0.48		
Overall	Established Universities	193	3.78	0.30	5.182	.000
	Emerging Universities	138	3.64	0.17		

As can be observed in Table 8, significant differences were found in average perceptions regarding the level of entrepreneurship at Saudi universities between established universities (M = 3.78, SD = 0.30) and emerging universities (M = 3.64, SD = 0.17), $t(329) = 5.182$, p = .000, in favor of established universities. This finding does not support the results of Anwar and Saleem's (2019) study, which found that students from diverse schools demonstrated the same level of knowledge regarding entrepreneurship. In the present study, there were also significant differences in the three dimensions of Organizational Capacity, People, and Incentives; Pathways for Entrepreneurs; and Measuring the Impact of the Entrepreneurial University, in favor of established universities. However, no significant differences were found between established and emerging universities regarding the level of entrepreneurship at Saudi universities in other dimensions.

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Zagelmeyer (2017) highlighted the need to develop an entrepreneurship ecosystem at institutions. Although numerous universities have functioned with such a strategy, the information asymmetries and variances in entrepreneurial endeavors are far more important (Belenzon, Chatterji, & Daley, 2017). A multilevel analysis must be applied to universities to determine not the existence of entrepreneurial programs, but rather their effectiveness (Clauss, Kesting, Miller, & Meerman, 2018). Miller and Acs (2017) remarked that transforming universities into entrepreneurship ecosystems requires a high level of specialization and effort.

Table 9
Kruskal-Wallis results of the differences between the mean responses of academic leaders by occupation.

Dimension	Occupation	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Leadership and Governance	Dean	4	159.63	1.763	3	.623
	Vice Dean	75	176.65			
	Department Chair	181	160.28			
	Vice Department Chair	71	169.70			
	Total	331				
Organizational Capacity, Peoples and Incentives	Dean	4	191.88	3.814	3	.282
	Vice Dean	75	152.41			
	Department Chair	181	174.39			
	Vice Department Chair	71	157.51			
	Total	331				
Entrepreneurship Development in Teaching and Learning	Dean	4	191.50	2.869	3	.412
	Vice Dean	75	181.09			
	Department Chair	181	160.70			
	Vice Department Chair	71	162.14			
	Total	331				
Pathways for Entrepreneurs	Dean	4	111.88	4.993	3	.172
	Vice Dean	75	157.03			
	Department Chair	181	175.65			
	Vice Department Chair	71	153.92			
	Total	331				
University and Business/External Relationships for Knowledge Exchange	Dean	4	241.50	6.915	3	.075
	Vice Dean	75	177.84			
	Department Chair	181	155.24			
	Vice Department Chair	71	176.66			
	Total	331				
The Entrepreneurial University as an Internationalized Institution	Dean	4	260.88	8.393	3	.039
	Vice Dean	75	179.85			
	Department Chair	181	155.31			
	Vice Department Chair	71	173.27			
	Total	331				
Measuring the Impact of the Entrepreneurial University	Dean	4	153.63	.276	3	.964
	Vice Dean	75	169.45			
	Department Chair	181	164.05			
	Vice Department Chair	71	168.02			
	Total	331				
Overall	Dean	4	203.38	1.661	3	.646
	Vice Dean	75	172.97			
	Department Chair	181	160.78			
	Vice Department Chair	71	169.84			
	Total	331				

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According to the Kruskal-Wallis test, there were no statistically significant differences in the average perceptions of entrepreneurship levels at Saudi universities regarding occupation (χ^2 = 1.661; p > 0.05) in the six dimensions of
Leadership and Governance (χ^2 = 1.763; p > 0.05);
Organizational Capacity, People, and Incentives (χ^2 = 3.814; p > 0.05);
Entrepreneurship Development in Teaching and Learning (χ^2 = 2.869; p > 0.05);
Pathways for Entrepreneurs (χ^2 = 4.993; p > 0.05);
University and Business/External Relationships for Knowledge Exchange (χ^2 = 6.915; p > 0.05); and Measuring the Impact of the Entrepreneurial University (χ^2 = .276; p > 0.05).
However, there were significant differences in the average perceptions according to participants' occupation within the dimension of The Entrepreneurial University as an Internationalized Institution (χ^2 = 8.393; p < 0.05).

In order to determine which groups were favored in terms of occupation, the Mann-Whitney U test was performed and indicated that there were no significant differences among the following:

- Dean and Vice Dean (U = 71.500; Z = -1.781; P = .075)
- Vice Dean and Vice Department Chair (U = 2556.000; Z = -.424; P = .672)
- Department Chair and Vice Department Chair (U = 5722.500; Z = -1.369; P = .171)

However, there were significant differences among the following:

- Dean and Department Chair (U = 141.000; Z = -2.117; P = .034) in favor of the Dean (Mean Rank = 148.25).
- Dean and Vice Department Chair (U = 62.000; Z = -1.920; P = .055) in favor of the Dean (Mean Rank = 58.00).
- Vice Dean and Department Chair (U = 5776.500; Z = -1.900; P = .057) in favor of the Vice Dean (Mean Rank = 141.98).

Some entrepreneurs prefer to be job creators rather than job seekers as they transfer from paid employment to establishing their ventures (Xi, Block, Lasch, Robert, & Thurik, 2018). Nonetheless, no statistically significant differences were found between the entrepreneurs who held a paid job and those who did not in the aforementioned study. Lilischkis (2017) stressed that teaching entrepreneurship at universities should be the role of every faculty member.

Kaartemo, Coviello, and Zettinig's (2019) results were compatible with the results of the current study, in that the deans were motivated to market the significance of entrepreneurship so that more students would enroll in their universities. Walsh (2019) found that although there were differences in universities' regional capabilities in terms of entrepreneurship educations, those variations may not reflect the actual characteristics of the universities.

A Kruskal-Wallis test was also conducted to determine whether there were significant differences in the average perceptions of the entrepreneurship level at Saudi universities among academic leaders that could be attributed to experience as an academic leader in higher education. As shown in Table 11, there were no significant differences in the average perceptions that could be attributed to experience as an academic leader in higher education (χ^2 = .842; p > 0.05) overall or within any of the seven dimensions of the entrepreneurial university. These findings are consistent with Harris's (2018) findings that leadership experiences do not have significant statistical influences on entrepreneurship. Robinson, VanderPal, and Nhat Hoang (2017) emphasized the importance of mentorship, observing that it is significantly different from leadership. Mentorship creates the

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foundation for increasing external relationships. Furthermore, Bienkowska, Klofsten, and Rasmussen (2016) revealed the need to improve perceived support for entrepreneurship.

Table 11
Kruskal-Wallis results of the differences between the mean responses of academic leaders by experience as an academic leader in higher education.

Dimension	Leadership Experience	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Leadership and Governance	Less than 5 years	114	174.40	2.846	2	.241
	from 5 to 10 years	159	156.94			
	more than 10 years	58	174.34			
	Total	331				
Organizational Capacity, People, and Incentives	Less than 5 years	114	170.50	1.391	2	.499
	from 5 to 10 years	159	167.53			
	more than 10 years	58	152.96			
	Total	331				
Entrepreneurship Development in Teaching and Learning	Less than 5 years	114	169.09	.257	2	.879
	from 5 to 10 years	159	163.32			
	more than 10 years	58	167.27			
	Total	331				
Pathways for Entrepreneurs	Less than 5 years	114	168.65	1.190	2	.552
	from 5 to 10 years	159	168.60			
	more than 10 years	58	153.66			
	Total	331				
University and Business/External Relationships for Knowledge Exchange	Less than 5 years	114	154.69	3.638	2	.162
	from 5 to 10 years	159	167.73			
	more than 10 years	58	183.48			
	Total	331				
The Entrepreneurial University as an Internationalized Institution	Less than 5 years	114	168.36	.913	2	.633
	from 5 to 10 years	159	161.29			
	more than 10 years	58	174.28			
	Total	331				
Measuring the Impact of the Entrepreneurial University	Less than 5 years	114	174.03	1.363	2	.506
	from 5 to 10 years	159	163.12			
	more than 10 years	58	158.11			
	Total	331				
Overall	Less than 5 years	114	170.22	.842	2	.656
	from 5 to 10 years	159	161.00			
	more than 10 years	58	171.41			
	Total	331				

A Suggested Paradigm for Transformation into an Entrepreneurial University

The current study investigates the level of entrepreneurship at established and emerging Saudi universities in the light of the EU-OECD framework from academic leaders' perceptions. Thus, based on the study results and the EU-OECD structure, along with a review of prior related studies, a paradigm is suggested for transformation into entrepreneurial universities. The four stages of the developed paradigm are presented in the following (Figure 1).

First Stage: Adopt the Idea of the Entrepreneurial University at Saudi Universities

The first stage is highly dependent on the senior leaders at Saudi universities as they should strongly believe in and be aware of the importance of transformation into entrepreneurial universities. Further, academic leaders must work on applying the dimensions of entrepreneurial universities by forming higher management at each university that is focused on ensuring the application of the

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principles and the aspects of entrepreneurial universities. This stage can be implemented by the Ministry Deputy for Research and Innovation in the Ministry of Education through the General Directorate for Innovation and Entrepreneurship as well as the University Affairs Council according to the new system.

Second Stage: Experimental Application

The second stage involves a demo that includes the following set of steps:

- ***Preparing a guide for the EU-OECD Framework:*** This guide will contain the requirements and stages for implementing the seven dimensions of entrepreneurial universities according to the EU-OECD model and will be distributed to all leaders, faculty and staff members, and students.

- ***Academic Leader Training:*** This will be developed by identifying training needs for educational leaders at Saudi universities, and establishing a plan for training and development in line with the requirements of entrepreneurial universities.

- ***Preparing a plan to implement the EU-OECD Framework model:*** This stage involves creating a plan for the experimental application of the framework at two universities, an established university and an emerging university. The university will adopt the seven dimensions of an entrepreneurial university according to the EU-OECD model and proceed with implementation. This experimental application must be carried out in stages on a minor scale; for example, the application can be applied to a college in the targeted university until the success factors are measured. Then, the application can be completed for the rest of the colleges, departments, and units of the university based on the fruitful results.

- ***Spreading and promoting an entrepreneurial culture:*** This will be a continuous step in all stages of the experimental application.

- ***Follow-up and evaluation:*** This will be a continuous step in all stages of the experimental application.

Third Stage: Evaluate the Experience (Correction & Improving)

The third stage is one of the most critical and assists in addressing weaknesses as well as identifying and confronting challenges. The evaluation process must take place in light of the entrepreneurial university requirements following the EU-OECD model.

Fourth Stage: Complete Application and Generalization of the Experience (Correction and Improvement)

The fourth stage is taken in light of the results of the follow-up and evaluation step as well as successful experimental applications, which allows the successful experimental application to be generalized to other Saudi universities. Having an integrated team that can transfer expertise to other universities is essential to expand the implementation of the entrepreneurial university model in Saudi universities. Finally, an Entrepreneurial University Award can be created and awarded to

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Saudi universities that have excelled in applying the standards of the entrepreneurial university according to the EU-OECD model.

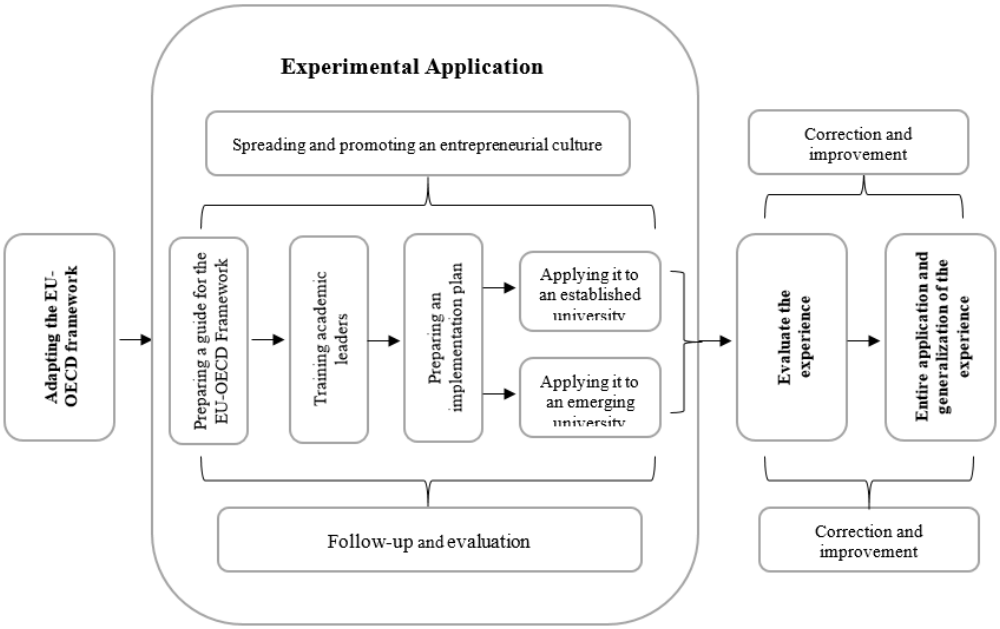

Figure 1. Suggested Paradigm for Transformation into an Entrepreneurial University (Al Ghamdi, 2020)

Recommendations

In light of the study results and the suggested paradigm for transformation into entrepreneurial universities, the following recommendations are provided:

1. Apply the suggested paradigm for the transformation of both established and emerging Saudi universities into entrepreneurial universities provided in the current study in light of the EU-OECD framework (Figure 1).

2. Promote a culture of entrepreneurship by holding conferences, forums, and seminars.

3. Integrate entrepreneurial activities at all levels of the university and commit to implementing an entrepreneurship strategy by academic leaders.

4. Ensure the diversification of self-financing sources instead of depending only on government funding.

5. Create a clear plan to integrate entrepreneurship in teaching and learning in a manner that promotes diversity and innovation rather than relying on traditional methods.

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6. Promote new relationships with internal and external stakeholders to build an entrepreneurial system.

7. Build external partnerships with incubators and science parks to create opportunities for knowledge exchange.

8. Integrate research, education, and industry activities to influence the ecosystem and transform it into an entrepreneurial system.

9. Support international mobility for university employees and students, in a way that allows the experiences of other pioneering universities to inform entrepreneurship and to provide benefits.

10. Establish an entrepreneurial strategy and continuously measure its impact at Saudi universities.

Conclusion

What transforms a university into an entrepreneurial one? Since it is challenging to determine one thing that turns university into an entrepreneurial university, this study provides a suggested paradigm in light of the EU-OECD framework for such transformation for Saudi public universities to be entrepreneurial universities. Indeed, the world today needs an entrepreneurial university instead of a traditional university that can cope with the turbulent environment. Those universities will not only benefit themselves but also will contribute to the development of the economy for the country as well by making pioneering outputs that capable of dealing and adapting with conditions of different types and difficulty levels.

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