



Research article

Development model for palm processing industries with emphasis on total innovation management (TIM) in Kerman province

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ABSTRACT

Conversion and complementary industries are one of the best ways to develop agricultural waste prevention. One of the problems facing the date-making and finishing industries is the problem. Lack of attention to the innovation of these industries and consequently lack of sufficient share in domestic markets and lack of access to global markets. This study examines the total innovation management in the fields of branding, packaging and pricing, customer orientation, and date and time-consuming advertising. Method: According to the goals and assumptions, descriptive-analytical research and its survey method is a survey. According to the Cochran formula, 155 people are involved in marketing, packaging and processing of dates in Kerman province. To answer the research question, a questionnaire was designed as the main research tool. SPSS software and AMOS software were used to analyze the results. Findings "Extensive Database of Resources", "New Technology", "Risk-taking Power", "How to Manage Workshops" are Top Priorities in Comprehensive Innovation Management in Convertible and Supplementary Industries and "Customer Oriented" Component Marketing And in the packaging of the component "smart packaging to maintain product quality" and in the processing of products "investment in the disinfection and grading sector" are the most important elements in the development of conversion and complementary industries.

1. Introduction

As one of the most important and effective industries in the world economy, the food industry faces many changes due to the globalization of economies and increasing competitiveness. Under these circumstances, to hold a position and create value added for the customers to keep them loyal, food companies are forced to generate competitive advantages. Therefore, they have to keep up and even expand these advantages (Food industry strategy plan, 2016). This industry currently has a vital role in the economy of our country (Iran), wherein more than 10,000 units are active in the food industry. These units cover more than 15% of the total industrial employment of the country. This industry makes up about 3.5% of GDP and more than 15% of the industrial value added. In 2015, Iran exported more than 1.575.000.000 dollars of food products. The export rate is increased by 1.5% from 2011 when it was 1.552.000.000 dollars (Fayz et al., 2015).

Given that the food industry in the industrial world is accompanied by intense competition and the active presence of large

transnational companies, competition in this industry goes beyond national borders and puts a lot of competitive pressure on activists in this field. The food industry in Iran is one of the important and influential industries in the economy, which will undoubtedly face many changes with the globalization of the economy and increasing competitiveness. In such a situation, to maintain the position and to create the value-added for customers and maintain them, food companies are forced to create competitive advantages for themselves and they try to maintain and develop these advantages (Food Industry Strategy Plan, 2016).

Harvesting over 900,000 tons of date every year, Iran is one of the largest date producers in the world. Many people in Iran depends on this product, as it provides various job opportunities (Iranian National Date Association, 2018). According to studies, due to the lack of investment and information about maintenance and taste of purchasers, no significant changes have taken place in processing industries and no major success has been accomplished in health issues and packaging in the export sector. One of the main failure factors is lack of coordination

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among administrative agents of the policies (which can meet part of internal demand) (Mortezaei, 2015).

Among agricultural products, dates are one of the most important garden products in Iran and one of the strategic products for our country. About 17% of the cultivated area and 13% of world date production belongs to Iran. Due to the importance of this product in the employment of tropical regions of the country and also the excess supply in the domestic market, it has a significant advantage in exports. Also, dates have always been considered by policymakers as a traditional export commodity in Iran's agricultural sector. Also, according to the latest Iranian customs statistics in 1390, the export of dates from Iran with an increase of 17.7 percent compared to 1389 has reached more than 174 million dollars. The weight of this amount with a growth of 2.5 percent is reported to be about 122 thousand tons. Today, all components of agricultural systems have a huge need for innovation to achieve sustainability (Tilman and Clark, 2015).

From different points of view, processing industries are important in the agricultural sector. These include increasing added value to agricultural crops, ensuring food security, increasing the productivity of the agricultural sector and reducing agricultural waste.

In developing countries, these are the main challenges of complementary transformation industries: regional trade-related bottlenecks, high production costs, inadequate infrastructure, lack of agricultural information, lack of appropriate production capacities, local market infrastructure weak, lack of financial resources, lack of access to equipment and ability to adapt the need for quality, lack of basic industrial information that banks can respond to when granting loans, and lack of market knowledge (UNDP, 2015).

Currently, research and development is considered the key to competition and access to modern technologies in the world. Technology can change the nature of a country's products and bring about fundamental improvements in economic and social life. Today, due to fundamental changes in research and development, there have been extensive changes in production and the structure of the economy from a traditional to post-industrial and information conditions. The key to such progress in the use of human capital, the expansion of research and development, is the appropriate application of skills and the integration of these categories in the form of a coherent organization of the factors of production (Mehrabi Basharabadi and Eternal, 2011).

In 2007, the World Bank announced that, different from the past, the engine of agricultural development does not depend only on production, but that much of this development depends on the market and that the inputs of consumption, trade and production in the agricultural sector have been unprecedented and rigorous. The nose is different now. Conversely, the potential growth of international communication technologies has provided the possibility of using the knowledge of production at one time for different purposes in other sections of the world. Innovative activities are capable of driving the engine of agricultural development to spread to the global markets.

Regarding the role of alternative industries in the development of rural regions, the development of innovation management mechanisms is of great importance in these areas. An innovation system for agriculture can fill this gap by focusing on other factors than promotion, education, and research. To this end, such a system also should consider factors such as incentives, developers of professional skills, new activists, partnership development resources, traditional innovation sources (Local knowledge), rules, and regulations. After meeting the conditions of actualizing ideas, materializing innovations, and easing linear relations, it becomes a process and mutual reaction between interferers.

Since the mid-twentieth century, globalization has increased dramatically, resulting in improved relationships between markets, and these changes have resulted in intense competition, with innovations emerging as intermediaries of business competition (Efrat et al., 2016).

Conversion industries are the groups in which an agricultural product is converted into another form in order to achieve better consumption, better supply, and increased economic value. So the nature of the new

product and the nature of the raw material are the same, but compared to the raw material, the final product is a new material.

The creation of conversion and complementarity industries has significant and positive effects on strengthening the rural economy, which increases the level and diversity of products and maintains agricultural land and the rural landscape. Given talents of the region and the positive impact of agro-industry and the natural and social characteristics, the connection between the two sectors of agriculture and industry is imperative for sustainable rural development (Poormeizan and Akbari, 2014).

Today, agriculture has a great need to innovate in the implementation of the agricultural system. As food demand (associated with increasing human population) increases worldwide, agricultural innovations aim to save energy, enhance biodiversity, improve soil and water quality, and reduce application use. Pesticides, which have detrimental effects on human health, have been clearly demonstrated as innovations aimed at preventing food shortages, and in adapting food to the specific needs of the population (young children, pregnant women, the elderly ...) in Processing of agricultural products is required.

Innovation is the necessity and necessity of the life of a civilization. The new circle of world development in the present age is witnessing a wide competition based on innovation in order to access scarce and limited resources that guarantee the path of long-term and sustainable growth of society. Applying the word innovation to a phenomenon requires that its occurrence cause markedly significant qualitative changes. With the discussion of development, which is not limited to technical innovation, as well as the entanglement of a set of factors that lead to the emergence of an innovation, there is a significant difference between today's understanding of the concept of innovation and what Schumpeter envisioned. The fact is that the innovation paradigm is evolving and one can see a change in the nature of innovation (Foundation Young, 2012).

TIM implementation undergoes three transformations from single innovation to total innovation, separate innovation to integrated innovation, and the focus on only the firm's internal resources to emphasize the integration of internal and external resources. Therefore, innovation will be responsible for some people or functions and an integrated strategic process for adding and creating value. TIM calls for all functions and all employees involved in total innovation. As a result, the resources put into innovation will be much more significant, and the cost of TIM implementation will increase accordingly. In this situation, if TIM is not linked with innovation strategy to create more value in the market than it costs, it will not receive support and thus will fail. In a complex and dynamic market, only continuous innovation can drive a firm's sustainable growth and profits. However, in the innovation process, firms often drive themselves into "the war of innovative attrition" (Braun, 1997) and lead to the so-called innovator's dilemma (Christensen, 1997).

In Iran, most of the dates produced in conversion industries are consumed in the form of date juice, cake, and cookies. In addition to job creation, the exports of these products can be increased by investing in conversion industries.

Dates in Kerman province (Iran) are sold in bulk and nonstandard packing to brokers. Also, due to the lack of skilled workforce and innovation in processing and complementary industries, this product does not have a significant share in global markets. Also, the participatory method and use of indigenous knowledge are very insignificant in the institutional and organizational field.

With creating food security, the agro-processing industry has a vital role in improving poor people's access to food and increasing their purchasing power. According to proper marketing and transportation, processing industries can have an essential role in rural development.

Innovation will be an integrated strategic process for creating and adding value, not just the responsibility of certain actions or individuals. Therefore, TIM wants all employees to be involved in innovation. Due to the low use of local knowledge and participatory method, along with wholesale and non-standard sales of dates to brokers (due to lack of skilled manpower and innovation in complementary and conversion

industries), dates of Kerman province cannot have a significant share in global markets. While investing in processing industries can increase date exports. In addition, processing industries play an important role in increasing the poor people's access to food and increasing their purchasing power, and ultimately lead to rural development.

2. Review of literature

2.1. Framework and overview of modeling approaches

2.1.1. Conversion industries

Conversion industries guarantee food security and play a vital role in improving the accessibility of poor people to food and improving their purchasing power. Cost effective conversion and complementary industries, with proper marketing and transportation, play an important role in rural development (Olamade, 2014).

2.1.2. Total innovation management

We presented a theoretical framework of TIM. This part is focused on innovation or tri-totally or tri-comprehensiveness in innovation. By the first "totality" we mean innovation in all non-technological and technological components (culture, market, strategy, institution, organization). The second "totality" is related to the innovation of the involved individuals. The third "totality" includes innovation in all places and at all times. In the TIM as a developing paradigm, major contributions from previous research works are incorporated, and the significance of ecosystem thinking is emphasized. The TIM model is depicted in Figure 1 with an ecosystem standpoint. The synergistic link among all inherent components is also emphasized in TIM. Besides, as emphasized by TIM, all employees are innovators, and innovation is discovered in space/time totality of an organization. The definition of TIM is an ecological system that is organized by strategy innovation. The task of this system is accumulating and enhancing core competency for gaining a sustainable competitive advantage. In this part, the main elements of TIM as well as their roles are introduced. In the present work, TIM is emphasized as related to innovation in all sectors of the organization and all employees, covering all space and time dimensions. The components each have a major role in the TIM practice and are integral parts of the TIM framework. The all-elements innovation creates synergy between the non-

technological areas (chiefly institution, organization, market) and technological areas (chiefly process, portfolio, product) and organizational areas via efficient instruments and facilitator mechanisms, leading to encouraging and regulating innovation by the employees (Xu et al., 2007).

Dates are a very profitable crop suitable for the humid tropics, and the area devoted to this crop is likely to increase significantly in the future. It has many ecological properties throughout its life cycle. When properly managed, it has a positive carbon footprint and when grown in a landscape mosaic it can play a role in biodiversity conservation. Abuses in times of rapidly expanding ownership in natural forest areas and on the lands of poor rural communities have led to criticism from environmental and social activists. Date can have a valued influence to development, and the resulting prosperity can derive people to invest in improved environmental practices with good governance.

Total Innovative management discusses innovation, marketing, innovation management, innovation structure, innovation technology, innovation culture and process and instrument mechanism (Zhirong et al., 2000).

TIM holds that management depends on innovation and creativity and is becoming a creative and innovative organization developing programs of creativity and innovation, as well as for the use of creative engineering and innovation management techniques. Innovation does not necessarily means applying the newest technologies, but the concentration of companies and organizations of production units invests more in thinking and finding innovative solutions in the company than in dealing with the topic of technology (Hidalgo and Albers, 2008).

The right brand is necessary for high tech products to proper packaging for introducing marketing. Consumers are more inclined to high-tech products than to innovate in terms of profit and loss. Callaghan and Kerry (2016) supposes that the most important factor for getting into the international markets and creating jobs in the region is the use of packaging with chemistry, innovative and nanotechnologies.

DaiveParrilli and. (2016) and Tollin et al. (2014) inspected four topics to understand innovation. Scope, output, process, resources, area of innovation, including innovation path, innovation process and innovation orientation. Who accounts for innovation? Tools to be taken into account in innovation include: team structure for innovation, data update, information exchange, information output, efficiency and

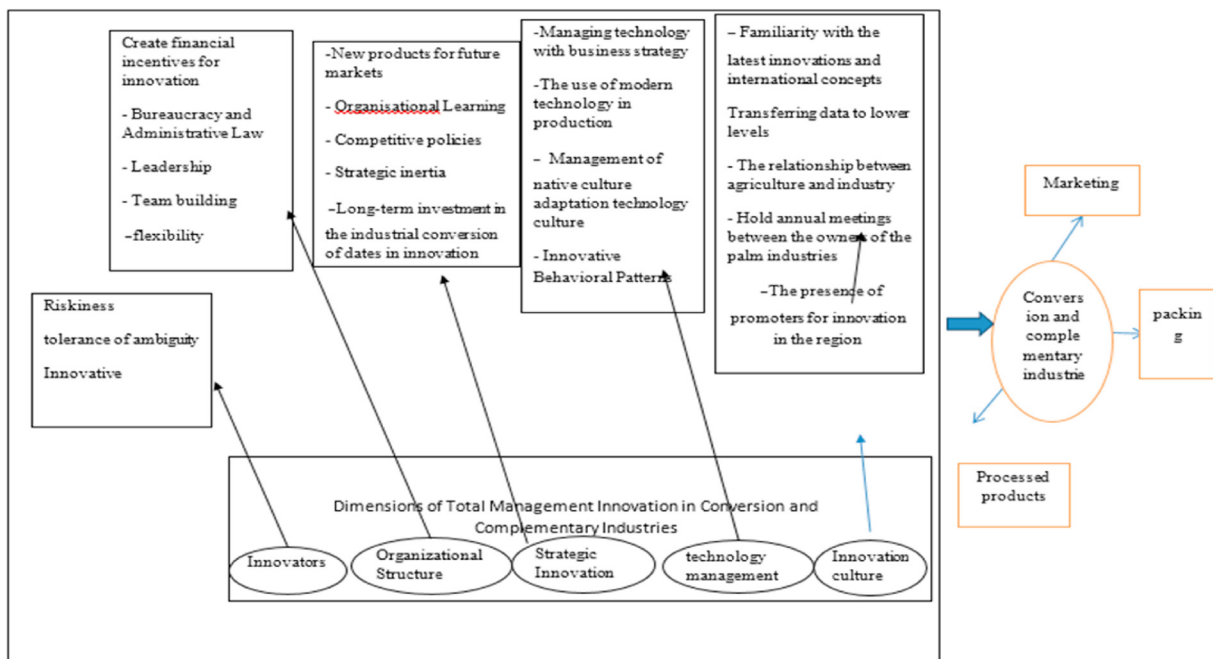


Figure 1. Research model.

productivity and innovation performance of projects at organizational level (Rahayu and Zulhamdani, 2014).

In the conversion and complementary industries, in the innovation process, the bureaucratic system and political bodies regard the government as the dominant member of innovation.

After examining the theoretical foundations of global research in innovation management in the processing industry and date palm manufacturing, a theoretical research model was proposed, which is illustrated in the figure below.

In terms of date export and overseas competitions, sorting, maintenance industries, including disinfection, drying, washing, treatment and investment in packaging favored by domestic and foreign markets, were insufficient.

A theoretical model of research has been designed by studying the research background (Figure 1).

2.2. Innovation dimensions

Innovation in products or services means that the organization uses the available or new technology creating changes in a service or product. This type of innovation is related to developing and marketing new services/products associated with customer satisfaction.

3. Modeling approaches

3.1. Materials and methods

The statistical population of this study includes 200 persons working in marketing, packaging, and marketing of dates in conversion and complementary industries of Kerman province. Sample volume was determined with the Cochran method as 155 persons. The data gathering tool is a questionnaire by the researcher, with 58 items as shown in Chart 2 with a 5-point scale Likert evaluation system (Totally agree = 5, Agree = 4, No comment = 3, Disagree = 2, and Totally disagree = 1). The validity of the questionnaire was checked through expert opinion. To determine the reliability, Alpha Cronbach was used. The obtained 0.07 coefficient of this criterion confirms the tools' reliability.

Ideas of palm industry owners for development in the processing industry are displayed in Chart 2. To determine the importance of variables, we graded the items available in the marketing based on a load of that said item in the structural equation. The results indicate that "using communication methods in marketing" is the number 1 priority in the marketing of the processing industry, while the "seller data of the brand name for the customer" has the least importance.

The conceptual model of research is presented based on the information provided in the previous sections of this study and the context of this thesis (i.e., comprehensive management of innovation in alterant-complementary industries of Dates) and reviewing theoretical materials and related experimental research studies. As shown in Figure 1, comprehensive innovation management consists of 5 factors: Innovation culture, organizational structure, technology management, strategic innovation, and innovators. These factors affect the development of the conversion and complementary Date industry with three elements of marketing, packaging, and processed goods.

Based on the statements above, the thesis hypotheses are as follows:

There is a meaningful relationship between the comprehensive management of innovation and the development of conversion and complementary industries of Dates.

The positive weight of all regressions or factor loads is a logical and acceptable theoretical result.

Strategic elements of innovation, Innovation culture, technological management, organizational structure, and innovators have coefficients of 0.69, 0.80, 0.83, 0.62, and 0.73, respectively. They correlate with conversion and complementary industries.

Amos Model guide.

The guide of elements used in the Amos Model.

In marketing, the "impact of the customer-oriented approach" has the highest correlation coefficient with 0.76. In packaging, "using advanced technology in packaging Dates" has the highest correlation rate with 0.85.

In processing, investing in disinfection and dry-cleaning sections has the highest coefficient at 0.82.

Processing the agricultural food (especially dates) can be considered a reliable method to develop conversion and complementary industries.

4. Results and discussion

Comments of palm industry owners for marketing in processing industries presented in Table 1. In order to determine their importance, the items in the components of marketing were ranked based on their corresponding factor loadings in the final structural equation model. The results of Table 2 indicate that "Using communication tools in marketing" is prioritized highest among the items of marketing in processing industries and the item " Seller information about the brand for the customer " has the lowest priority.

Duo to the Cronbach's alpha coefficient for all variables is above 0.7 according to Table 1, the reliability of the questionnaire is confirmed.

The purpose of marketing is typically to increase public awareness. In fact, this awareness can help industries and selling organizations to increase their sale. Organizations achieve a competitive advantage by creating integrated marketing communications. In other words, these communications can help them to offer their intended brand and image to the public. Comments of palm industry owners for marketing in processing industries presented in Table 2. In order to determine their importance, the items in the components of marketing were ranked based on their corresponding factor loadings in the final structural equation model. The results of Table 2 indicate that "Using communication tools in marketing" is ranked highest among the items of marketing in processing industries and the item " Seller information about the brand for the customer " has the lowest priority. It is compatible with the results obtained. Ghafourian Shagardi et al. (2014) Sarmad Saedi Abdollahi Bajestani (2014).

Packing is one of the most critical and also determining stages in supply and demand of commodities. It can even affect the quality and content of goods and many of consumers prefer packing over quality. There are numerous packing problems in Iran. Some of the important ones are as follows: lack of culture and belief in society toward packing, low knowledge about packing, as a subset of marketing, low quality of packing machinery and equipment, high cost of printing and also packing (because most of primary materials are imported).

Table 3 presents the comments of palm industry owners for packing in processing industries. In order to determine their importance, the items in the components of packing were ranked based on their corresponding factor loadings in the final structural equation model. The results of Table 3 indicate that "Local culture in packing" is ranked highest among the items of packing in processing industries and the item " Date packing

Table 1. Cronbach's alpha of research variables.

Variable	Cronbach's alpha coefficient
Needs assessment	0.784
investment	0.895
Innovation	0.963
branding	0.842
packing	0.833
Advertising	0.875
Pricing	0.741
Customer Orientation	0.763
Transformation and complementary industries	0.941

Table 2. Descriptive statistics for marketing in processing industries.

Item	Mean rand	SD	Coefficient of variation	Rank
Using communication tools in marketing	4.14	1.26	0.305	1
impact of customer-orientation approach	3.62	1.11	.306	2
Launching date marketing website in development of date processing industries	3.65	1.15	0.315	3
International brand in date packing	3.77	1.21	0.320	4
Appropriate pricing in marketing	3.53	1.14	0.322	5
Internal branding in date marketing development	3.57	1.16	0.324	6
Date brand advertisement	1.32	1.23	0.336	7
Seller information about the brand for the customer	3.12	1.21	0.387	8

Table 3. Descriptive statistics for packing in processing industries.

Item	Mean rand	SD	Coefficient of variation	Rank
Local culture in packing	3.70	1.00	0.270	1
Packing methods according to international standards	3.20	1.00	0.312	2
Modern transportation methods	3.67	1.15	0.313	3
Preserving quality by type of packing	3.11	0.99	0.318	4
Using skilled force in packing	2.93	1.10	0.375	5
Using advanced technology of date packing	3.28	1.27	0.387	6
Date packing in terms of appearance and adequate information in international markets	3.94	1.18	0.932	7

in terms of appearance and adequate information in international markets " has the lowest priority. The rapidly changing tastes of customers are putting an increasing amount of pressure on globally positioned brands (Steenkamp et al., 2003), but locally positioned brands are gaining popularity as they can target local tastes and adapt to them better (Steenkamp, 2019).

In Iran, on average 31% of sale is related to packing costs. These results are in accordance with those of Liu et al. (2017), Truong et al. (2017), Callaghan and Kerry (2016), O' Callaghan and Kerry (2016), Majid et al. (2016), and Troott and Simms (2017).

Comments of palm industry owners in Table 4. In order to determine their importance, the items in the components of processed products were ranked based on their corresponding factor loadings in the final structural equation model. The results of Table 4 indicate that "Investing in disinfection and dry-cleaning sections "is ranked highest among the items of processed products in processing industries and the item "separation of gardens based on export-domestic consumption - processing industries" has the lowest priority. These results are consistent with those of Balali et al. (2014), Gagliardi et al. (2014), and Liu et al. (2015).

Designing a development model for palm processing industries with emphasis on total innovation management has been demonstrated with emphasis on comprehensive management of innovation using the Structural Equation Model. Structural equation modeling was performed using the AMOS software. The model illustrates a special causal structure between a set of latent constructs. Measurement and structural models were constructed; the structural model was derived from the measurement model after items with weak loadings were trimmed. A structural equation model is composed of two components: a structural model that

specifies the causal structure between the latent variables and a measurement model that represents the relationships between latent variables and observed variables. The research model is as. Figure 2 shows the structural model:

Using general value indicators, the question can be answered that regardless of the specific values reported for the parameters, is the model generally supported by the collected experimental data or not? If the answer is yes, the model is acceptable. Otherwise, efforts should be made to correct it. To interpret the values in Table 5, we must say: The second root index of the average of the remaining squares, or RMSEA, indicates whether the developed model can be considered acceptable. This index, which is known as one of the bad indicators of value, its value varies between zero and one, and the smaller the value obtained, the more acceptable the developed model is considered. For the developed factor model, it indicates that the model is acceptable. Comparative indicators have also been developed to evaluate the acceptability of the model based on its comparison with the independence model. These indicators take values between zero and one, and values above 0.90 have been interpreted as acceptable values in most sources. In Table (5), the Luke Toker Value Index (TLI), which is the same as (NNFI), is 0.950, and the Comparative Value Index (IFI) is 0.960, and their values are more than 0.90. Therefore, based on these indicators, the developed model is considered acceptable (see Table 6).

Structural equation model was used for testing the research hypotheses (investigating for a significant positive relationship between development of date processing industries and organizational, technological, strategic, cultural, and underlying individual variables).

Table 4. Descriptive statistics for processed products in processing industries.

Item	Mean rand	SD	Coefficient of variation	Rank
Investing in disinfection and dry-cleaning sections	4.00	1.00	0.250	1
Education need assessment in processing industries	3.94	1.18	0.299	2
Acquisition of knowledge in product processing and its application	3.57	1.16	0.308	3
Innovations in processed products such as palm sauce, palm pickles, palm chocolate	3.96	1.27	0.320	4
Establishment of fairs of various products of processing industries	3.53	1.14	0.322	5
Proper Warehousing	3.57	1.26	0.352	6
separation of gardens based on export- domestic consumption - processing industries)	2.49	1.1	0.440	7

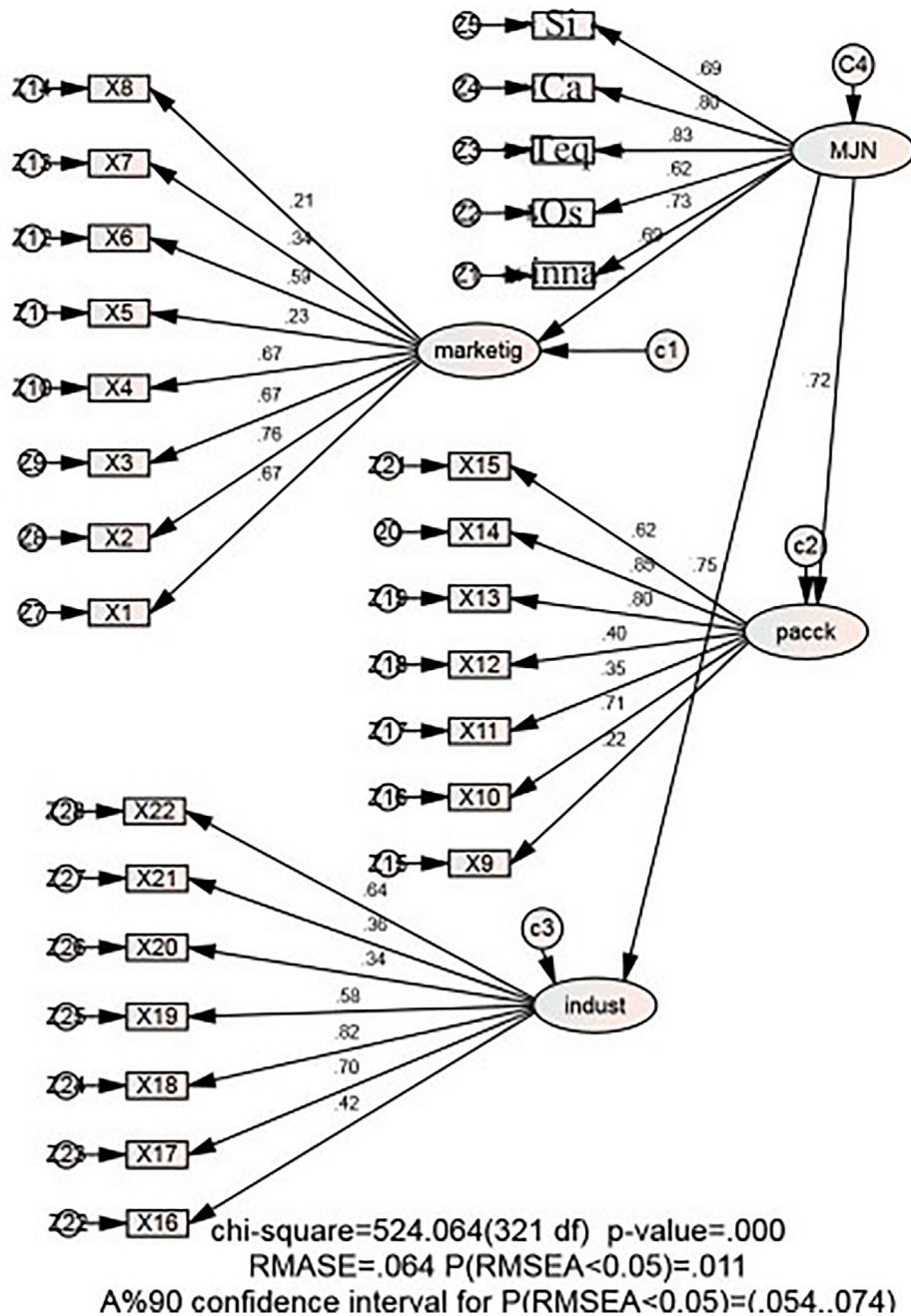


Figure 2. Path diagram of the research model.

Factor loadings in Figure 2 indicate positive significant relationship between development of date processing industries variable and each of elements of strategic innovation, technology management, innovation culture, and organizational structure. Factor loadings for strategic innovation, innovation culture, technology management, and organizational structure and innovators are 0.69, 0.80, 0.83, 0.62 and 0.73 respectively.

According to the results of this analysis, the research hypotheses are supported. Each of the elements in the components of the model are ranked based on the factor loadings represented in the path diagram (Figure 2). In the culture of innovation, the item "vast database of information and resources related to innovation" is ranked highest with a standardized regression weigh of 0.79. Then "the attempt of date industries for globalization" with a factor loading of 0.60 is ranked second. These results are consistent with the findings of Khosravian et al. (2009); Wagidi Kia (2009), and Hugh Han et al. (2017). In strategic innovation,

the element "long-term investment in the transformation and complementary industries" with a factor loading of 0.76 is of highest rank, and "the presence of palm growers and owners of palm industries at the university's dissertations" with a regression weight of 0.69 is ranked second. According to these results, the field of investment in machinery will improve the productivity and safety of workers in palm trees, which is in line with the research results of (Gagliard et al., 2014).

In technology management, "the use of new technology" with a factor loading of 0.73 is the major component and "management of technology with business strategy" with a factor loading of 0.52 is ranked after that. This finding is consistent with the results of Ali Abadi and colleagues (1394) and Lee et al. (2017) and Liu et al. (2017) and Troott and Simms (2017). In organizational structure, "corporate governance with open and honest communication" with a factor loading of 0.79 is ranked highest and "financial incentives" with a factor loading of 0.72 is ranked second.

Table 5. Guide to the factors used in the AMOS model.

Explain the factors	Factor	Explain the factors	Factor	Explain the factors	Factor
Launching date marketing website in development of date processing industries	X1	impact of customer-orientation approach	X2	Using communication tools in marketing	X3
Internal branding in date marketing development	X4	Appropriate pricing in marketing	X5	International brand in date packing	X6
Local culture in packing	X7	Seller information about the brand for the customer	X8	Date brand advertisement	X9
Preserving quality by type of packing	X10	Modern transportation methods	X11	Packing methods according to international standards	X12
Date packing in terms of appearance and adequate information in international markets	X13	Using advanced technology of date packing	X14	Using skilled force in packing	X15
Acquisition of knowledge in product processing and its application	X16	Education need assessment in processing industries	X17	Investing in disinfection and dry-cleaning sections	X18
Proper Warehousing	X19	Establishment of fairs of various products of processing industries	X20	Innovations in processed products such as palm sauce, palm pickles, palm chocolate	X21
Strategic innovation	si	Total innovation management	TIM	separation of gardens based on export- domestic consumption - processing industries)	X22
Organizational Structure	os	technology management	MJN	Culture innovation	ca
Processing	indust	packing	pack	innovators	inno

Table 6. Overall fit indicators for the conceptual model.

Index	Normal limit	Observed value
DF	Larger than zero	261
Ratio of χ^2 to df	Between 2 and 5	3.153
Goodness of Fit (GFI)	0.9 and larger	0.941
Normed Fitness Index (NFI)	0.9 and larger	0.925
Non-Normed Fitness Index (NNFI)	0.9 and larger	0.950
Incremental Fit Index (IFI)	0.9 and larger	0.963
Root mean square error of approximation (RMSEA)	Below 0.05	0.027
P-value	Below 0.05	0.000
PNFI	Below 0.05	0.580

These findings are consistent with the results of Salimzade et al. (2015) and Mohammad Kazemi et al. (2012). In psychological characteristics, "risk" with a factor loading of 0.81, the "internal control" with a factor loading of 0.72, are ranked first and second respectively, which is consistent with the results of Efrat et al. (2016). According to Table 4, of the indices of model fit (χ^2 to $df = 3.153$, $GFI = 0.941$, $RMSEA = 0.064$, $p\text{-value} = 0.000$), all reasonably well indicate the model fits the research data. These fit indices are in the acceptable criteria and justify the credibility of the structural equation model.

5. Conclusion

Nowadays, in order for the conversion and complementary industries of palm to be able to survive and implement the market policy making, they need to analyze market and its information. To fulfill this, industries should upgrade their activities by using total innovation management and also using marketing communications. The purpose of marketing communications is typically to increase public awareness. In fact, this awareness can help industries and selling organizations to increase their sale.

Development of conversion and complementary industries, purposeful and active participation in international environments, and increase of efficiency of industries are among key strategies. These, however, can be achieved only when total innovation management precepts are taken into account.

In disinfection and drying grading, waste increases due to reasons such as not completely separating defective and moldy dates from healthy ones, non-observance of personal hygiene by workers, inappropriate grading location, use of inappropriate equipment in date packaging. In this regard, issues such as not washing and disinfecting dates before packaging and the lack of minimum basic equipment for storing dates in warehouses also increase the rate of product spoilage. In the transportation stage, according to the quality of the cultivars, there is some waste. Investing in this sector and research and development in the disinfection and separation phase can be effective in globalizing date processing.

The obtained results revealed that there are positive and significant correlation between total innovation management factors and palm conversion and complementary industries dimensions. It is, then, recommended that owners and managers of these industries enhance their innovation and management by compiling a suitable strategic program and seeking advice and consultation from technical forces and experts. In fact, instability of marketing policies and also low knowledge and literacy of the owners in Kerman regarding business and legal rules have caused them to act weakly in terms of palm research and marketing. Thus, it is recommended that palm guild perform more powerfully to support the rights of its members and also increase the quality and quantity of its supervision on issues related to packing, grading, transportation, and hygiene of products. On the other hand, the guild is recommended to pave the way for producers to import their products and brand them in the world. Reducing bureaucracy and supporting innovations and incentive policies is the proposed solution of this research.

Due to the factor of instability in income of palm export in Iran, it is recommended to take measures such as holding educational classes (on planting, protecting, and harvesting), This, in turn, helps them to be able to compete in new markets.

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Author contribution statement

All authors listed have significantly contributed to the investigation, development and writing of this article.

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Data availability statement

The data that has been used is confidential.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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