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Verification and Validation of the New Product's Outcomes Development on Open Innovation in Small and Medium

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Abstract

Purpose: The current research is conducted to achieve the verification and validation of the outcomes of new product development on open innovation in small and medium-sized companies by using a mixed method.

Design/Methodology/Approach: The research's methodology is derived from internal and semi- structured interviews with 16 subject experts and managers in the field of knowledge-based country's companies. They were selected purposefully by sampling related to quality. Two coders confirmed the validity of the research data through intra-subject agreement. The data analysis was done by Strauss and Corbin's model in open-axis and selective coding in TI8 information software. The statistical population in the department was a number of employees in business and production companies; there were 384 people selected as the sample size using Cochran's sampling formula. The tool for gathering information is a researcher's questionnaire. This questionnaire was the qualitative result of the research, and for validity and construct validity, the CVR method and analytical factor analysis were used. The reliability of the instrument was increased by using Cronbach's alpha coefficient.

Findings: The results demonstrate that the outcomes encompass three key dimensions: financial-economic, marketing, and structural. The findings indicate the new product development model has a good fit. Also, it identified outcomes based on the discovery of the factor discussed, which can directly affect economic and structural areas. In the field of economic finance, the use of open innovation helps the production of new products and sales development. This also reduces the need to produce more specialized and complex products as a competitive advantage.

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Introduction:

Due to rapidly advancing technology, changing customer preferences, and dwindling demand for outdated products, product life cycles have shortened. The main factor in success in the current chaotic environment will be the ability of the organization to establish new products. (Soltani Feskandis et al.) Survival and growth are valuable in most companies. New product development is a vital source for an organization's competitive profit, which will bring the ability to create competitive profit, create entry barriers for competitors, create new markets, and ultimately increase revenues and rewards for companies. In a competitive business environment, organizations must create a new product and utilize their resources and capabilities for successful sales and profits, leading to superior market performance. (Ozdemir et al.) Resource scarcity, the transition away from oil-based economies, and the advent of new technologies have profoundly reshaped the landscape of numerous commercial enterprises. This transformation has led to the rise of small and medium-sized industries (SMEs) as a dominant force in the modern economy (Shariat et al., 2019, p. 35). In small and medium-sized businesses, focusing on product development is always a key goal. Small and medium-sized companies are provided with numerous benefits in developed nations, as they hold a crucial position in the economies of these countries. Nowadays, small and medium-sized companies are seen as economic motivators and employment. As much as the growth of large industries is decreasing, the role of small and medium-sized companies is becoming more prominent. However, a high percentage of small and medium-sized companies in the year the initial establishment faces failure (Malekzadeh et al., 2014: 38). Due to the importance of small and medium-sized companies and their high failure rate, the issue of new product development has also gained special dimensions (B. Ahrini Zare et al., 2017 (42), p. Gomes et al., 2 Martinez et al., 3 Calof et al., however, numerous studies show that the failure rate of new product development is a fundamental problem. It has been argued in many companies that this has this has caused companies to develop new products. In the 1970s, 20% of the company's profits came from new products, increasing to 33%. By the 1990s, this number had risen to 50%. Between 1985 and 1990, according to some research, over 42% of the company's sales came from newly introduced products. Based on this information, it was anticipated that the quantity of products provided by these companies would increase by twofold. However, the new products continue to decline at an alarming rate. The latest research indicates that the success rate of the new product at the beginning (less than 60%) is 54.3% for England, 59% for the United States, 59.8% for Japan, and 49% for Spain. According to the realities that the failure of a new product results in huge costs for organizations, therefore, the

necessity of planning with a competitive approach has forced companies to apply appropriate approaches in the path of competition (Malekzadeh et al.). New product development remains an issue due to high failure rates and the need for venture capital. In addition, identifying the effective factors in the success of new product development is an important management concern (Shafizadeh et al., 2018 (40). In the early 1900s, the business landscape shifted from being straightforward and consistent to intricate and fast-moving, posing a significant challenge to numerous companies. Adaptability and flexibility—the capacity to adjust to a consistently evolving environment—have become crucial abilities. which is easily done by small and medium-sized companies, although large industries are still of interest to economic policymakers due to the advantages of mass scale effect, production scope, experience, and organization effect. But today, due to issues such as the rapid change and transformation of the market, pressures, demographics, innovations, the management and decision-making processes are becoming more complicated by the moment, the need for instant decisions and the rapidly changing demands of customers, etc., the need to pay attention to small and medium-sized companies and the trend Attention has been paid to these companies (Barbosa et al., 2021). They are facing budget cuts that have reduced them and thus increased planning. Some of the conventional ways of planning and predicting things that may exist in Iran, and in some cases, it is impossible to exist in Iran, comprise more than 80% of the business community, including only four percent of all companies. and they create approximately 5.15% of the national population, but large companies, which constitute 13% of all companies and account for 2% of the national workforce (Mehr Ali 2019.240), have important issues because it is a business. There are small and medium-sized businesses with it, and the turbulent environment is dominated by the presence of government rent laws, government companies, and the instability of economic conditions, especially exchange rate fluctuations. and uncertainty, which increases the challenges of this environment (Ghazi Noori et al., 2020). Various organizations inspired highly competitive environments that have characteristics such as increasing new technologies, advancing product obsolescence, changing speed of consumers and global markets (Dehghani Soltani & Mesbahi, 2019: 178). In this condition, due to technological changes and the reduction of the product life cycle, companies are under increasing pressure to develop management procedures and improve the development process of their new products. For achieving success in this situation, companies need this category to produce their products more quickly and to produce new products and innovators (Wau et al., 2017 (129). Scholars have focused on specific industries or organizational types, such as knowledge-intensive industries (Natalicchio et al., 2017; Audretsch and Belitski, 2022), SMEs (Hossain and Kauranen, 2016), and start-ups (Spender et al., 2017). The survival of organizations depends on the trend of new

products and the application of methods. With technological advancement, the increasing competition of organizations, the emergence of new production equipment, the short life cycle of products, fundamental changes in the needs and tastes of customers, etc., the production of new products has faced new challenges. (Gortler and Asik 2021:5). Also, because of the risks that exist in providing new products, companies should continuously think about improving the development of new products (Azer et al., 2015 (2)). The development of new products is a major benefit as well as a challenging task. The current offerings of each company represent fresh opportunities for business success in the marketplace. (Ardito et al., 2021): four cases of successful development and commercialization of new products are one of the main means of obtaining sustainable competitive advantages. On average, new products account for about 35% of companies and about 10% of products that are commercially successful (Gomes et al., 2021: 6) . The successful performance of new product development, according to the structure, averages between 30 and 70 percent of the profitability of companies (Naliji et al., 2016) (28). Firms in suchemerging economies are experiencing a rapidly changing industrial environment (Liu et al., 2020, Wang et al., 2021) with significantly increased levels of competition in product markets. The question of how firms develop new products efficiently in intensely competitive environments has, therefore, become critical.

One of the most important factors that can influence the development of new products is open innovation (Estmartinez et al., 2021 (3)). Open innovation has been hindered by intellectual property issues, making it difficult to fairly distribute benefits between internal and external stakeholders, causing problems for internal investment and key personnel (Kalf et al., 2018: 722).

Nearly two decades of OI research have thus resulted in a significant body of literature. Yet, recent studies suggest that OI projects and activities still appear to be much more difficult to successfully create and execute than traditional innovation projects (e.g., Abhari and McGuckin, 2022; Audretsch and Belitski, 2022; Shaikh and Randhawa, 2022).

Recent research suggests that knowledge loss has a strong relationship with innovativeness in new product development (Lyu et al., 2022) and radical innovation performance (Zhang et al., 2022).

In 2022, several Mexican TV personalities made videos and used social media to directly criticize the Mexican president and the ecological impact of a government-funded project related to the development of a tourist train in the Mayan jungle (De Miguel 2022). Thus, it is not uncommon for Mexican citizens to express their dissatisfaction with

the government and its policies (Freedom House 2023).

Although information technology (IT) is an important means to address innovation challenges (Kohli and Melville 2019, Karhade and Dong 2021a, Andrade-Rojas et al. 2024),

Design/Methodology/Approach:

This research aims to provide and validate outcomes for developing new products based on open innovation in small and medium-sized enterprises (SMEs). The study employed a mixed-methods approach.

Considering that the aims of this research are to provide and validate the outcomes for developing new products based on open innovation in small and medium-sized companies, the present research in terms of practical purpose, data collection time, a cross-sectional survey, the nature of the data, and a qualitative research approach is weak. In order to answer the research questions, academic studies and literature research, theoretical background related to the topic, and interviews were used. Also, descriptive and inferential statistical methods were used to investigate the research questions. For this purpose, a tool for explaining the results of observing the organizational actions related to the research topic and an exploratory interview of the managers of small and medium industries have been used. The sample to be interviewed was 16 people. For their selection, purposeful sampling and the snowball method were used, and a semi-structured, in-depth interview with open questions was conducted with them. The method of analyzing the data obtained from the interview is the foundation data method. In the quantitative part, a questionnaire derived from the factors was distributed among the statistical sample after confirming its validity and reliability. The statistical population of the current research in the quantitative part was all the employees of manufacturing business companies, of which 384 people were selected as the sample size using Cochran's sampling formula. The sampling method was simple in the quantitative random section. The analysis method in this section is partial least squares.

Results and Discussion:

This section employs first- and second-order confirmatory factor analysis (CFA) conducted through Smart PLS software. Before delving into the results, it is essential to assess the fit of the measurement model, which is detailed below.

3.1. Fitting the outcome measurement model

In general, the analysis using the partial least squares method consists of three parts: the measurement model, the structural model, and the general model. The variables of the model are divided into two categories: hidden and obvious

variables, which are also used at different levels. The section of the measurement model includes questions (indices) for each dimension along with that dimension, and the relationships between questions and dimensions in this section are analyzed. The structural model section includes the structures from the main research model, with a focus on the degree of correlation and relationships between them. In the overall model section, comprising both measurement and structural model sections, the fit of a model is verified by confirming its completeness. The discussion will focus on evaluating and adjusting the three components of the model: measurement, structural, and general parts.

Finally, the overall model integrates both the measurement and structural models to assess the model's overall goodness-of-fit and explanatory power. This involves evaluating the model's capacity to accurately depict the interplay between both observed and latent variables.

3.2. Model fitting using Smart PLS software

In order to measure the fit of the measurement model, index reliability, convergent validity, and divergent validity were used. The reliability index for measuring internal reliability includes three measures of factor loading coefficients: Cronbach's alpha and composite reliability. Convergent validity measures how closely a structure is related to its indicators, while divergent validity measures how a structure's relationship with its indicators compares to its relationship with other structures

3.3. Measurement of factor loadings and significant numbers of outcome measures

Many times, by calculating the correlation value of the indicators of a structure with that structure, the calculation and its appropriate value are equal to or more than 0.5. In fact, the factor load indicates that the variance between the construct and its indicators is greater than the variance of the measurement error of that construct. The factor loads resulting from the implementation of the model are shown in Figure 1. In addition, in the research, factor loadings have been reported along with the cross-loading test.

3.4 Convergent validity and divergent validity of results

The next criterion for examining the fit of measurement models is convergent validity, which examines the degree of correlation of each construct with its questions. Convergence validity shows the high correlation of indicators of a structure compared to the correlation of indicators of other structures, which should be evaluated in reflective models. In order to evaluate the

validity of the convergence, the mean of the extracted variance is used. The value of this coefficient varies from 0 to 1, and values higher than 0.4 are accepted. Due to the fact that several codes for some concepts will be removed from the final model, this index will be increased for the outcomes. According to the results from Table 5, the significance level for the results is less than 5%, hence the extracted average variance index is significant.

3.5 Cronbach's alpha and composite reliability of the outcome conditions

According to the data analysis algorithm in the partial least squares method, after measuring the factor loadings of the questions, it is time to calculate and report Cronbach's alpha coefficients and the composite reliability of the constructs. The explanation of each is as follows: composite reliability coefficient or structural reliability coefficient: It is a factor that can be used in evaluating the reliability of the internal consistency of reflective models. The value of this coefficient also varies between zero and 1. Values higher than 0.7 are accepted, and values less than 0.60 are considered unfavorable. According to the results of Table 9, the significance level of the results is less than 5%, hence the combined reliability index is significant. Cronbach's alpha coefficients are another factor that can be used in evaluating the reliability of the internal consistency of reflective models. The value of this coefficient also varies between zero and 1. Values higher than 0.7 are accepted, and values less than 0.60 are considered unfavorable. It should be mentioned that in the case of variables with a small number of questions, the value of 0.6 has been introduced as the limit of Cronbach's alpha coefficient. According to the results of Table 11, the significance level for the results is less than 5%, hence Cronbach's alpha index is significant.

3.6. significance coefficient of the results

The first and most basic criterion for measuring the relationship between structures in the model (the structural part) is significant numbers. If the value of these numbers exceeds 1.96, it indicates the validity of the relationship between the constructs and, as a result, the confirmation of the relationship between the concepts and the outcomes at the 95% confidence level. Table 12 presents the model related to significant coefficient values (T-values).

Table 12: The coefficient of significance of the relationships of each of the concepts with the outcomes

3.7. Determination coefficient and adjusted determination coefficient (results)

The second criterion for checking the fit of the structural model in research is the R2 coefficients related to the endogenous (dependent) hidden variables of the model. As mentioned earlier, these coefficients are a measure that shows the impact of an exogenous variable on an endogenous variable, and three values of 0.19, 0.33, and 0.67 are used as criteria values for weak, medium, and strong values of R2 in opinions. According to the obtained results, it can be said that the determination coefficients of the components are strong for all dimensions. As shown in Table 14, the significance level for the coefficient of determination for all concepts is less than 5%; therefore, the coefficients of determination obtained for the desired concepts are significant. As shown in Table 15, the significance level for the adjusted coefficient of determination for all concepts is less than 5%; therefore, the adjusted coefficients of determination obtained for the desired concepts are significant.

3.8. General fitting of the outcomes model

By using this criterion, the researcher can control the fit of the overall part after examining the fit of the measurement part and the structural part of the overall research model. Three values of 0.1, 0.25, and 0.36 have been introduced as weak, medium, and strong values. The evaluation criterion of the overall fit is calculated in the following way:

$$GOF = \sqrt{\overline{communalities} * \overline{R^2}}$$

$\overline{\text{Communalities}}$: the average of the shared values of each structure

$\overline{R^2}$: is the average value of endogenous structures of the model.

The amount of this parameter for the current research model is:

$$GOF = \sqrt{0.6087 * 0.778} = 0.68819$$

Considering that three values of 0.1, 0.25 and 0.36 have been introduced as weak, medium and strong values, obtaining a value of 0.68819 indicates a very strong fit.

3.9. The coefficient of predicting the results

This criterion, which was introduced by Stone and Geiser, determines the predictive power of the model, and they believe that models with acceptable structural fit should be able to predict indicators related to the endogenous structures of the model.

the model should be capable of accurately forecasting outcomes based on the relationships identified within its structure. This predictive capability serves as a crucial measure of the model's overall efficacy and generalizability.

This means that if, in a model, the relationships between the structures are defined correctly, then the structures are endogenous to the model. This means that if in a model the relationships between the structures are correctly defined, the structures whose Q2 value in the case of an endogenous structure with three values between 0.02 and 0.15 indicate weak influence, and between 0.15 and 0.35 indicate a moderate effect greater than 0.35 indicates a high effect of independent variables on dependent variables. According to the coefficient of determination values, f2 values were obtained as follows, and it can be said that the impact of the remaining concepts in the model is moderate and can predict the changes in the outcome measurement model. Outcomes include three codes (financial-economic outcomes, marketing outcomes, and structural outcomes). Financial-economic outcomes can include factors such as income increase or decrease, economic growth or stagnation, inflation, price fluctuations, and developments in the financial market. Marketing outcomes may include customer acquisition or loss, increased or decreased revenue due to successful or unsuccessful marketing strategies, advertising effects, and customer satisfaction. Outcomes may refer to changes in organizational structure, work processes, organizational capabilities, and internal and external relationships. These outcomes can have a wide impact in three financial, economic, marketing, and structural areas. In the financial-economic field, the use of open innovation can help diversify the production of new products and sales development. This can reduce costs and produce more specialized and sophisticated products, which is a competitive advantage. In the field of marketing, open innovation can help meet customer needs and change consumer culture. Also, it can lead to the improvement of marketing plans and new product development. In the structural field, the use of open innovation can help supply raw materials, develop products in the production process, and speed up the production of products. Also, it can help to select target markets through social networks and quick access to technical know-how. Using these results, it is possible to improve the performance of companies in the market and facilitate growth and development.

Research proposals

According to the research results and identified concepts, it can be acknowledged that the development of new products based on open innovation can bring many opportunities for small and medium-sized companies. Below are some practical suggestions for these companies:

• Management of resources for innovation: creating a special budget for innovation activities, new product development, and research and development can provide the

necessary facilities and resources for these activities. Facilitating the process of evaluating and selecting ideas: Creating a systematic process for evaluating and selecting ideas based on specific criteria such as technical feasibility, marketability, and profitability can help focus on more effective ideas.

• Development of cooperation networks: Creating cooperation networks with other companies, startups, research centers, and the government can lead to the sharing of resources, knowledge, and experiences, and, as a result, the development of more innovative products.

• Using government support plans: Using government support plans and programs to encourage innovation and new product development can help companies access the financial and technical resources necessary for these activities.

• Training and development of innovation skills: creating training programs and developing skills related to innovation and new product development for team members can help increase their capabilities in this field

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6.**Tables**:

Table 1: Results

code	concepts	category
Diversity in the production of new products and sales development due to the use of open innovation	Financial-economic outcomes	outcomes
Help reduce costs due to the use of open innovation		
Production of specialized products as a competitive advantage due to the use of open innovation		
Product complexity as a competitive advantage due to the use of open innovation		
Responsiveness to customers' needs due to the advantage of product leadership resulting from open innovation	Marketing implications	
Changing consumer culture due to the use of open innovation		
Advancement of marketing plans for new product development due to the use of open innovation		
Production of products in accordance with global standards to enter foreign markets		
Assisting in the supply of raw materials and product development in the production process using open innovation	structural outcomes	
Accelerate the production of products due to the use of open innovation		
Selecting target markets through social networks due to the use of open innovation		
Using open innovation in research areas		
Rapid access to technical know-how due to the use of open innovation		

Table 2: Load of codes and standard estimation coefficients of outcomes

factor load	code	Estimation coefficients	concepts	category
0.840	Diversity in the production of new products and sales development due to the use of open innovation	0.864	Financial-economic outcomes	outcomes
0.779	Help reduce costs due to the use of open innovation			
0.880	Production of specialized products as a competitive advantage due to the use of open innovation			
0.795	Product complexity as a competitive advantage due to the use of open innovation			
0.840	Responsiveness to customers' needs due to the advantage of product leadership resulting from open innovation	0.909	Marketing implications	
0.769	Changing the consumer culture due to the use of open innovation			
0.848	Advancement of marketing plans for new product development due to the use of open innovation			
0.788	Production of products in accordance with global standards to enter foreign markets			
0.777	Assist in sourcing raw materials and developing products in the manufacturing process using open innovation	0.874	structural outcomes	
0.757	Accelerate the production of products due to the use of open innovation			
0.837	Selecting target markets through social networks due to the use of open innovation			

factor load	code	Estimation coefficients	concepts	category
0.841	Using open innovation in research areas			
0.640	Rapid access to technical know-how due to the use of open innovation			

Table 3: significant numbers of the codes and dimensions of the conditions of the results

Significance level	Significant numbers	code	Significant numbers	concepts	category
0.000	37.675	Diversity in the production of new products and sales development due to the use of open innovation	40.686	Financial-economic outcomes	outcomes
0.000	19.712	Help reduce costs due to the use of open innovation			
0.000	52.540	Production of specialized products as a competitive advantage due to the use of open innovation			
0.000	34.177	Product complexity as a competitive advantage due to the use of open innovation			
0.000	31.067	Responsiveness to customers' needs due to the advantage of product leadership resulting from open innovation	69.702	Marketing implications	
0.000	18.387	Changing the consumer's culture due to the use of open innovation			
0.000	26.218	Advancement of marketing plans for new product development due to the use of open innovation			
0.000	26.826	Production of products in accordance with global standards to enter foreign markets			
0.000	29.776	Assist in sourcing raw materials and developing products in the manufacturing process using open innovation	53.732	structural outcomes	
0.000	19.979	Accelerate the production of products due to the use of open innovation			
0.000	35.437	Selecting target markets through social networks due to the use of open innovation			
0.000	40.356	Using open innovation in research areas			
0.000	12.853	Rapid access to technical know-how due to the use of open innovation			

Table 6: The matrix of divergent validity measurement by Fronel and Larcker method of outcomes

	outcomes	Marketing implications	structural outcomes	Financial-economic outcomes
outcomes	0.706			

Marketing implications	0.909	0.812		
structural outcomes	0.874	0.701	0.774	
Financial-economic outcomes	0.864	0.711	0.592	0.824

Table 5: Significance of average variance extracted results

Concepts and implications	The main mean	Sample mean	standard deviation	T	The significance level
outcomes	0.498	0.500	0.027	18.424	0.000
Marketing implications	0.659	0.658	0.037	17.905	0.000
structural outcomes	0.599	0.600	0.026	23.335	0.000
Financial-economic outcomes	0.679	0.682	0.026	25.744	0.000

Table 8: Combined reliability coefficient of outcomes

Components and variables	Combined reliability
	Combined Reliability
outcomes	0.927
Marketing implications	0.885
structural outcomes	0.881
Financial-economic outcomes	0.894

Table 9: Significance examination of the combined reliability of the results

Components and variables	The main mean	Sample mean	standard deviation	T	The significance level
outcomes	0.927	0.927	0.008	123.632	0.000
Marketing implications	0.885	0.884	0.017	52.426	
structural outcomes	0.881	0.881	0.012	76.540	0.000
Financial-economic outcomes	0.894	0.895	0.012	77.127	0.000

Table 10: Cronbach's alpha of the results

Components and variables	Cronbach's alpha
	Cronbach's Alpha
outcomes	0.914
Marketing implications	0.828
structural outcomes	0.830
Financial-economic outcomes	0.842

Table 11: Significance of Cronbach's alpha index of the results

Components and variables	The main mean	Sample mean	standard deviation	T	The significance level
outcomes	0.914	0.914	0.010	95.852	0.000
Marketing outcomes	0.828	0.825	0.028	29.159	0.000
structural outcomes	0.830	0.829	0.019	44.002	0.000
Financial-economic outcomes	0.842	0.843	0.019	43.495	0.000

Table 12: The coefficient of significance of the relationships of each of the concepts with the outcomes

Components and variables	The main mean	Sample mean	standard deviation	T	The significance level
Implications->Marketing Implications	0.909	0.910	0.013	69.702	0.000
Outcomes->structural outcomes	0.874	0.875	0.016	53.732	0.000
Outcomes->financial-economic outcomes	0.864	0.865	0.021	40.686	0.000

Table 13: Coefficients of determination and adjusted coefficients of determination of outcomes

concepts	The coefficient of determination	Adjusted coefficient of determination
	R Square	R Square Adjusted
Marketing implications	0.826	0.825
structural outcomes	0.764	0.763
Financial-economic outcomes	0.746	0.745

Table 14: Significance of coefficients for determining outcomes

concepts	The main mean	Sample mean	standard deviation	T	The significance level
Marketing implications	0.826	0.829	0.024	34.929	0.000
structural outcomes	0.764	0.765	0.028	26.931	0.000
Financial-economic outcomes	0.746	0.749	0.037	20.411	0.000

Table 15: Significance of adjusted determination coefficients of outcomes

concepts	The main mean	Sample mean	standard deviation	T	The significance level
Marketing implications	0.825	0.828	0.024	34.764	0.000
structural outcomes	0.763	0.764	0.028	26.793	
Financial-economic outcomes	0.745	0.748	0.037	20.305	0.000

Table 16: Power coefficients for predicting outcomes

Variables and components	SSO	SSE	Q^2 (=1-SSE/SSO)
outcomes	3,341.000	3,341.000	
Marketing implications	1,028.000	508.418	0.505
structural outcomes	1,285.000	735.714	0.427
Financial-economic outcomes	1,028.000	537.194	0.477

7.Figures:

Figure 1: Model in standard estimation mode to provide factor loadings of outcomes

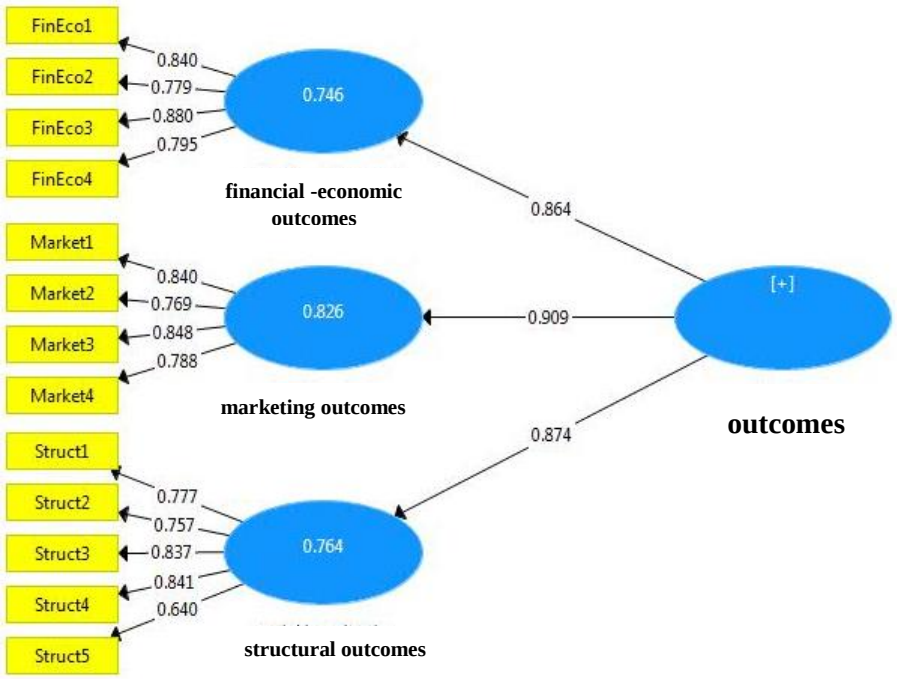
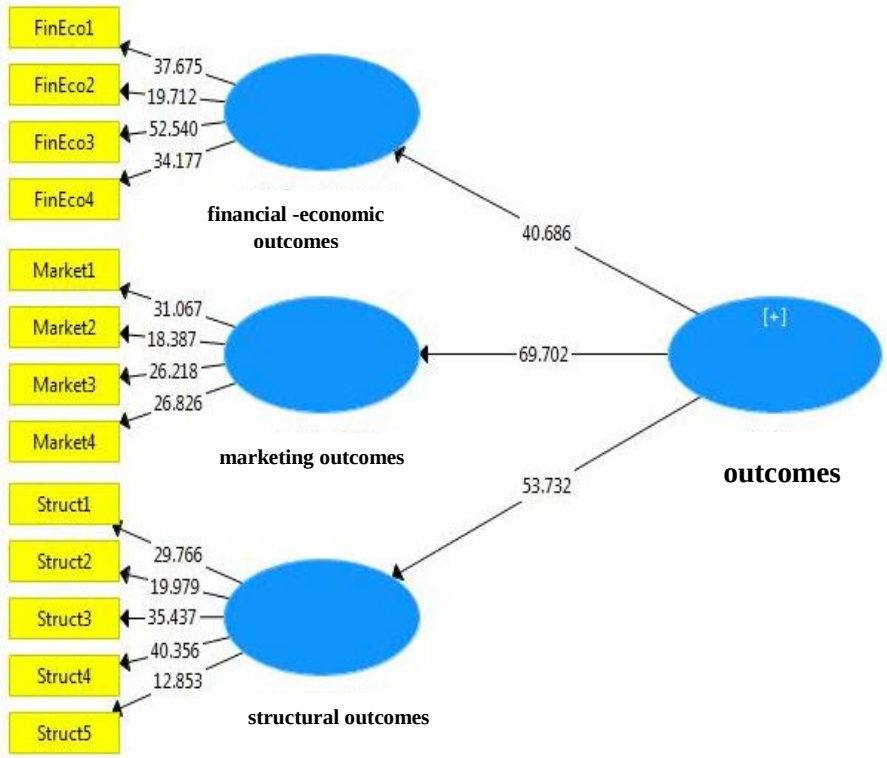


Figure 2: Model in the mode of significant numbers to provide significant numbers of outcomes



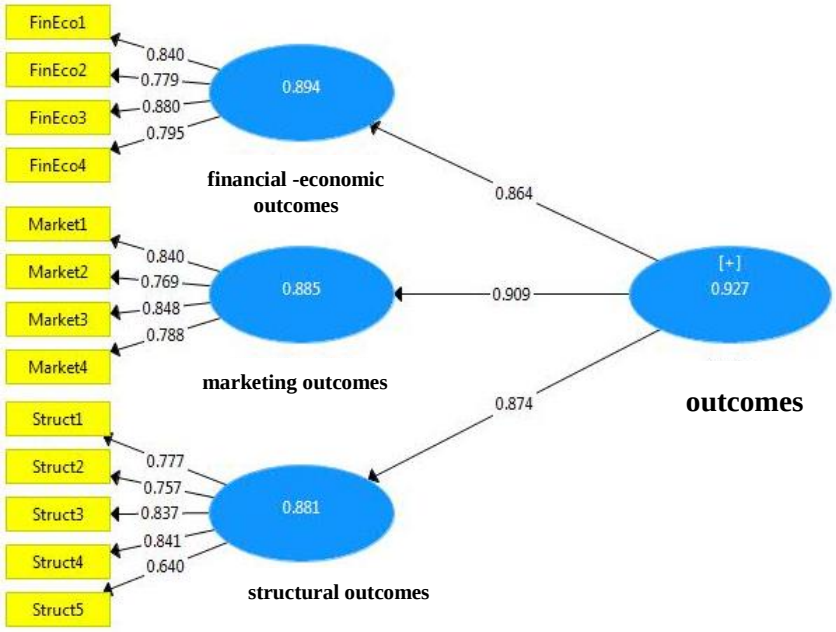


Figure 3: The model in the average state of the extracted variance of the results

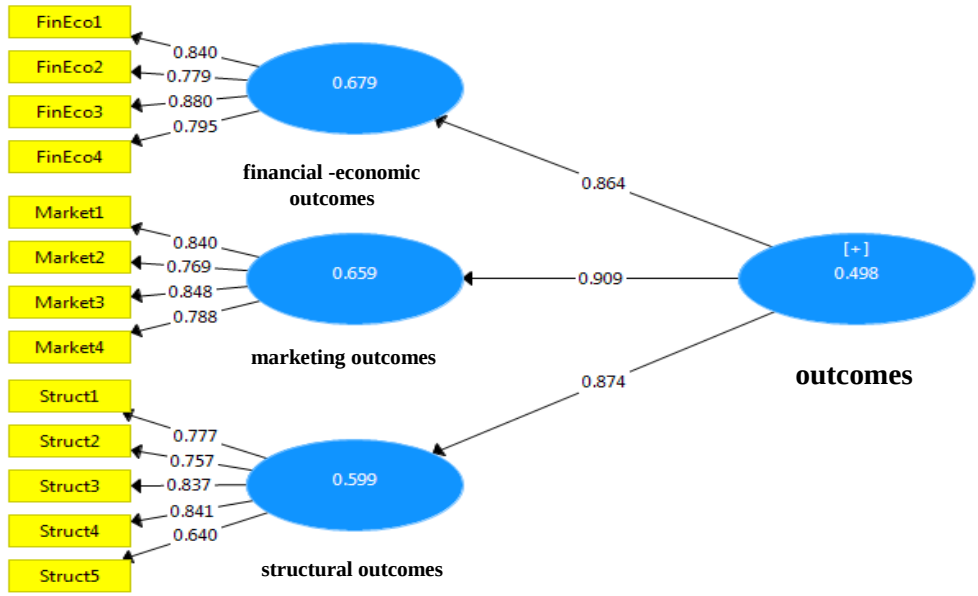


Figure 4: The model in the calculation mode of the combined reliability index of the results

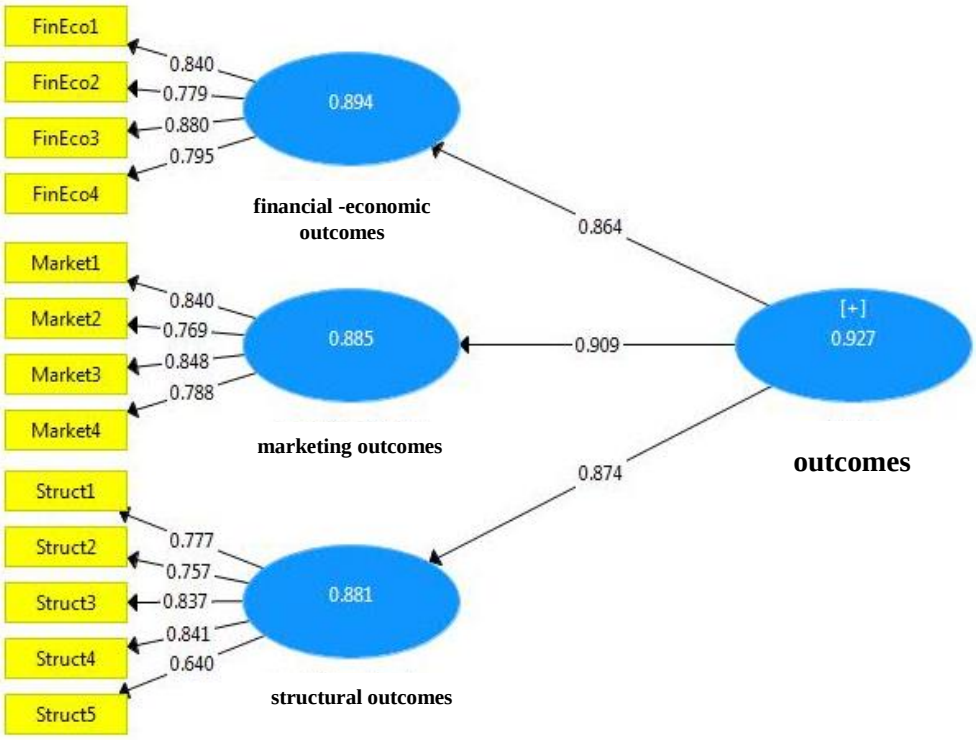


Figure 5: The model in the calculation mode of Cronbach's alpha coefficient index of the results

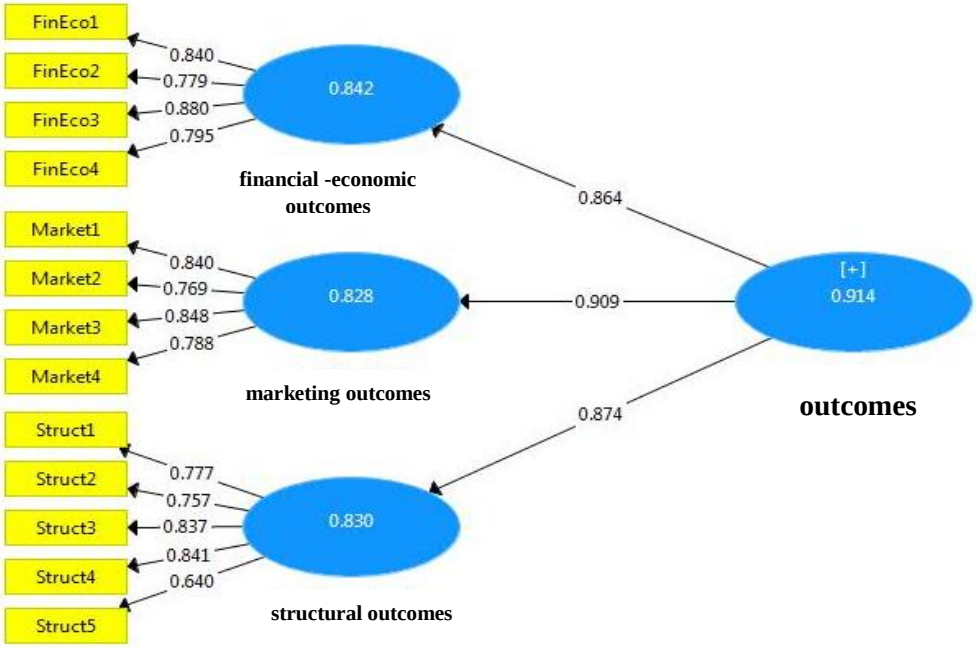


Figure 6: The model in the form of numbers, the coefficient of significance of the relationships of each of the concepts with the outcomes

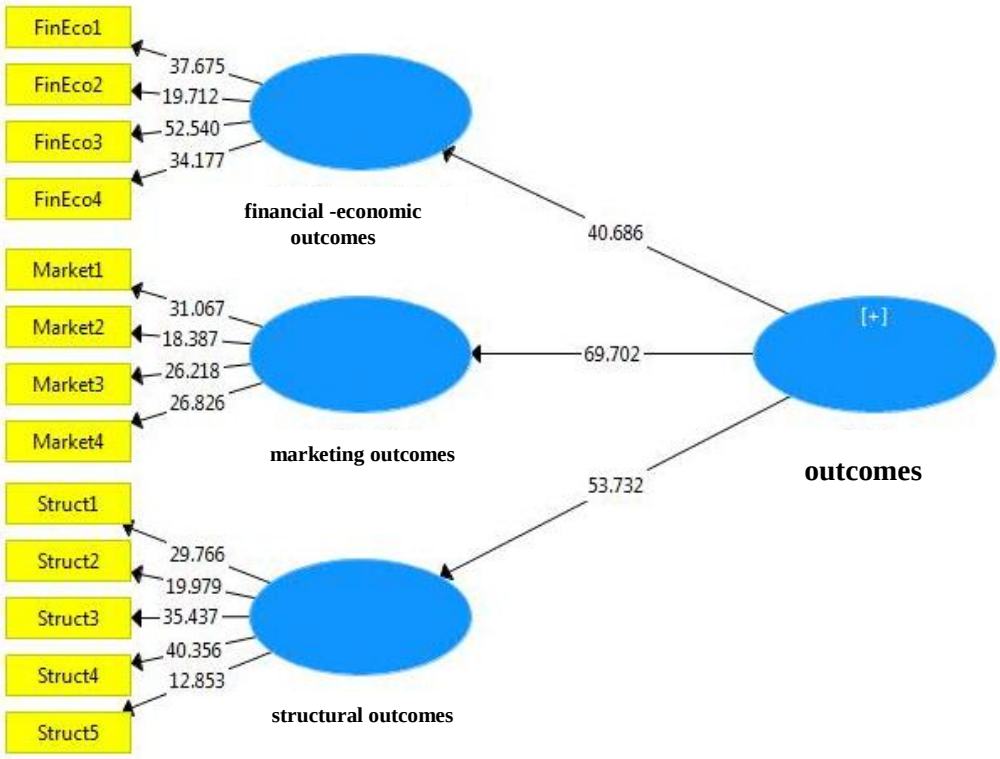


Figure 7: Model in the mode of coefficients of determination for outcomes

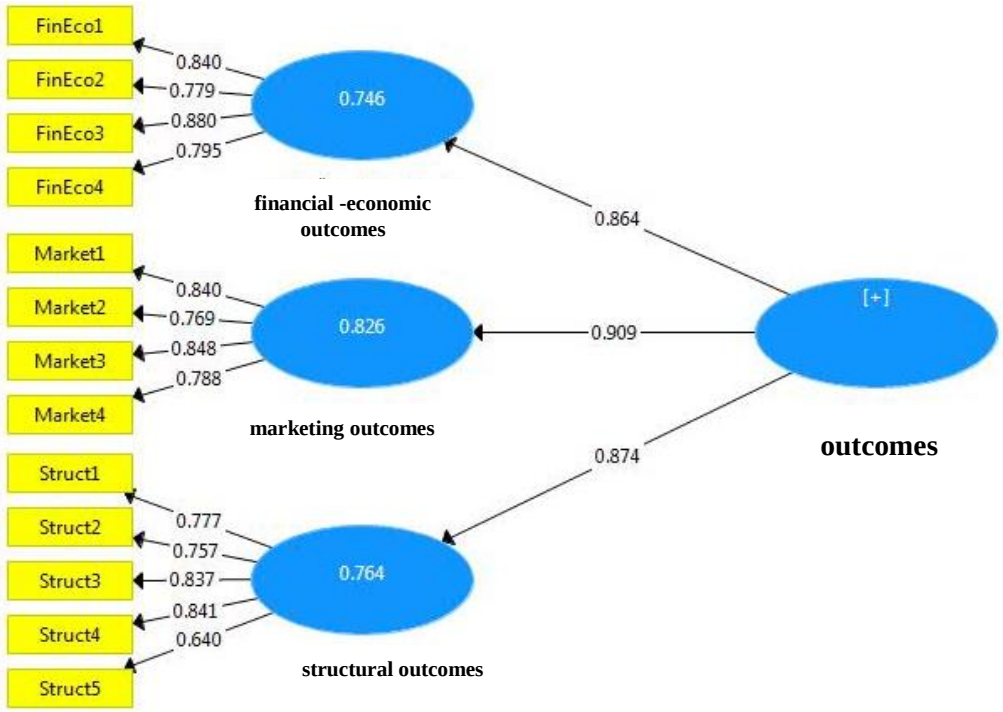


Figure 8: Model in adjusted coefficients of determination for outcomes

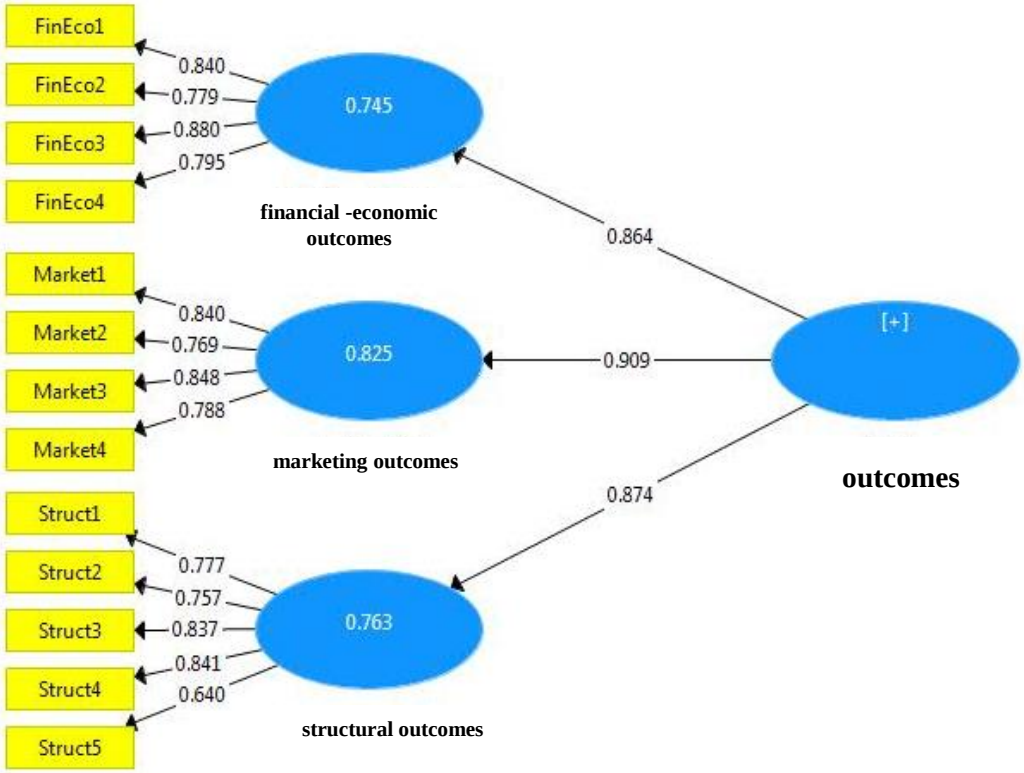


Figure 9: The model in the mode of power factor for predicting outcomes

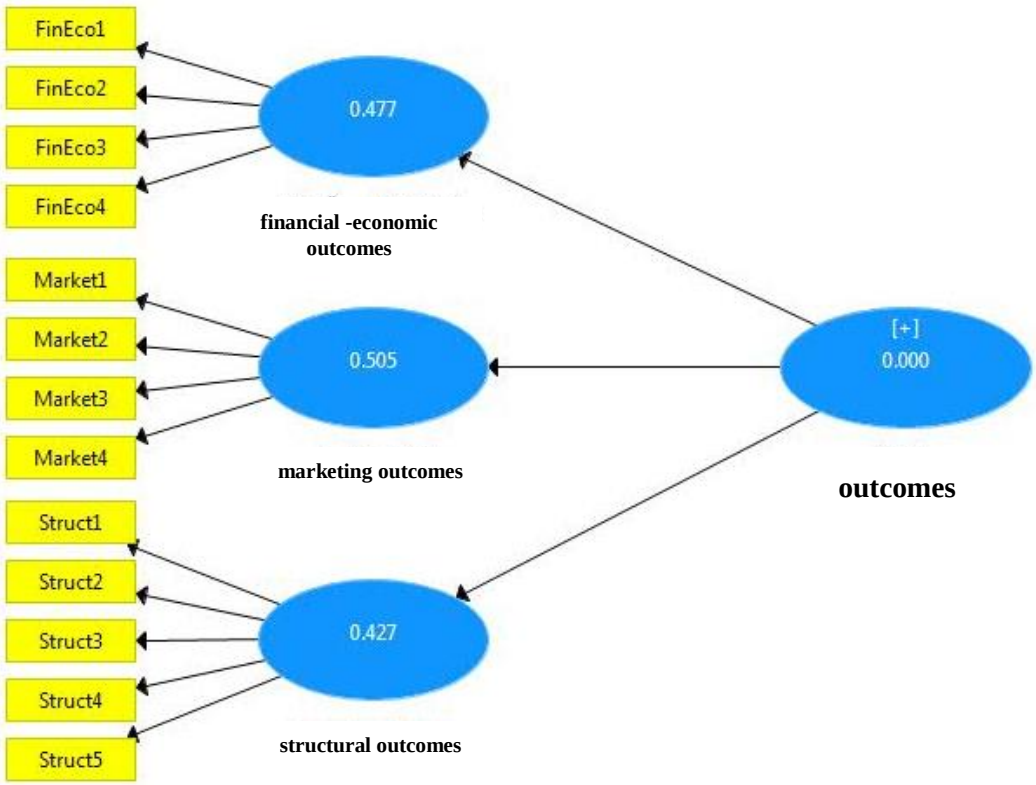
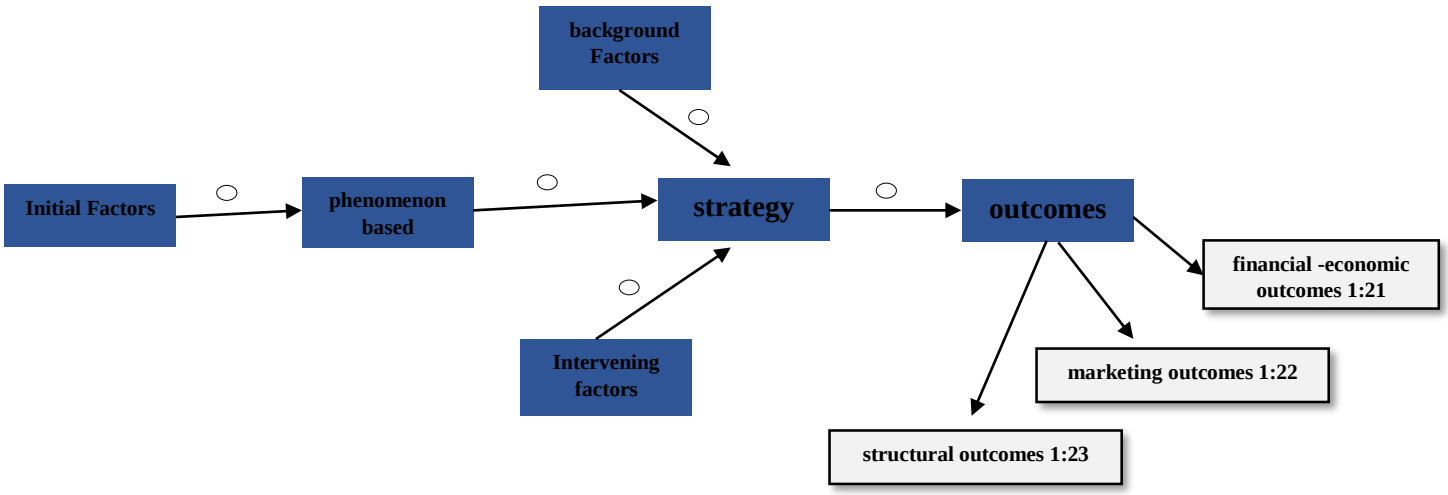


Figure 10: Conceptual model of research



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