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Identification and Categorization of Effective Factors and Indices in Measuring the Maturity of Accounting Information System

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ABSTRACT

Management accounting highlights the use of accounting information for decision making and optimal control and management of executives in organizations. Accounting information is provided comprehensively by the accounting information system (AIS). To develop the AIS, the maturity of the system should be determined. In this regard, the first step is to identify and categorize maturity factors and indices. This research study aimed to identify and categorize the factors and indices effective in measuring the AIS maturity in the large manufacturing industries located at Markazi province. The research method was descriptive and library method and field studies were also used to collect data. The statistical population encompassed two groups: AIS experts whose scientific comments were applied in the selection of indices, and the employees in experienced AIS who determined the impact of the factors. Using Factor Analysis, the factors and indices used to measure the AIS maturity were categorized and 36 effective indices in nine factors were selected. Then their impact was calculated using structural equations. Finally, the factors with effective indices were categorized and the findings and recommendations were provided to the major industries of Markazi province, as special beneficiaries, and other industries.

Keywords: Maturity of accounting information system, Accounting information system, Maturity indices of accounting information system.

1. Introduction

The role and effect of accounting information in management accounting and in making its economic decisions is so broad that the continuity of the economic units without having access to the relevant, comprehensive, and sufficient information about investment and expected returns seems to be impossible. Hence the successful economic units and investors have access to more timely information (Darabi et al., 2016). AIS is a successful system in providing accounting information. The accounting information system is a system that collects and stores financial data through accounting processes. After processing the concerned data, it generates the information used by the organization's decision makers. Finally, intelligent accounting information system can help decision makers and managers of the organizations in their strategic plans by providing sophisticated financial reports. Making a decision requires the provision of accurate, timely, and reliable information, which necessitates the use of complex financial and non-financial systems. One of the most important systems in decision making is the accounting information system (Hajiha & Nabiyouni., 2014).

The proper accounting information system will have a positive impact on the organization's performance. The system is efficient when it can evolve in line with changes in the environment and organization. According to the contingency theory, in line with changes made in an organization's internal and external conditions, evolution of the accounting information system in accordance with the management accounting practices seems to be of essence (Melnyk et al., 2014). The evolution of an information system requires six steps, based on Nolan model: identification, dissemination, control, comprehensiveness, data management, and maturity (Javanmard, 2013). The system evolution is also applied to the accounting information systems and can be implemented in two ways. First, the system evolution can be examined in incrementally during a long term. Accounting information systems in organizations grow with the advent of a computer. The second approach to examine the evolution of the accounting information system is performed through a short term and may take only a few years. An AIS evolution project may be used to design and deploy AIS or to improve AIS in the organization (Trigo et al., 2016).

To benefit from the positive effects and benefits of information management, the organizations must achieve the integrity of the AIS or its progress, and this will not be possible unless the system maturity is measured. To measure the AIS maturity or progress, it is necessary to determine the status of the AIS in its life cycle, and this requires identifying the measurement factors and indices. This is the subject addressed in the present study; therefore, the significance of the research is specified. Furthermore, the previous research has not covered this subject and this is the novelty of this study.

In Iran, different organizations have been concerned with the development and improvement the accounting information system as well as the IT application and progress in finance and accounting, regardless of the fact that their existing system is actually a mechanized financial system, and they have mainly assigned a human task to a machine, i.e. computer. The system components has not experienced a same degree of growth in terms of software, hardware, user affairs, and database documentation (Grossman, 2018). Different organizations also need to develop both accounting information system and IT; therefore, they should identify the factors necessary for the development (maturity) of the information system to design the system development program in order to reach maturity.

Many indices affect the AIS maturation and improve the performance of this system and its dynamics. Each group of relevant indices forms the AIS maturity factors. In other words, factors consist of multiple indices whose relevant factor and the degree of their impact on the maturity of the accounting information system need to be determined.

In the large industrial organizations, the smallest mistakes or defects in information cause large and sometimes irreparable costs. Major manufacturing companies in Markazi province, some of which are the leading or the most important in their relevant industries in Iran, also need to have an appropriate and complete AIS, and to determine how far they have progressed in this field to plan on the basis of their shortcomings in the AIS progress. If industrial organizations fail to determine their existing AIS status, they cannot actually develop and implement a

proper strategy and plan for its growth and development; therefore, they should first find out their AIS maturity status.

To determine the AIS maturity status, there are two main issues: identifying and categorizing factors and indices affecting the AIS maturity and then developing the AIS maturity measurement model. The study was to identify and categorize the progress factors and indices for the accounting information system in industrial organizations; thus, the effective factors and indices affecting the AIS life cycle assessment were first detected. The research questions raised in this study are as follows:

What are the AIS factors and indices to determine the status of the accounting information system progress?
How are identified factors and indices classified?

2. Literature Review

In the theoretical foundations of this research, the theory of information economics and then the AIS history and evolution as well as the AIS maturity are addressed.

2.1. Theory of Information Economics

With the advent of information economy theory, an informational vision emerged in the accounting mindset, which has been adopted in empirical research by some accounting researchers. This information paradigm considers information as scarce resources, just like other resources, which are used to produce or exchange in the economy. The demand (and thus value) of information is the result of improvements in making decision under the conditions of uncertainty. One of the main teachings of information economics is the uncertain nature of the value for each particular information resource. (Rahnamay Roudposhti et al., 2010). The theory of information economics has led accountants focus on the relationship of information and users to detect the determinants of the value of information.

2.2. Accounting Information System

AIS is a comprehensive and integrated, computer, and user-machine system, the output of which is to provide information to support accountants and managers in the organizations. In the Basic Concepts of Accounting Statement No.2, the Financial Accounting Standards Board defines accounting as a system, whose main objective is to provide useful information for decision making. The American Accounting Association first stated in 1996 that accounting was an information system and implemented the general theories of information in the field of effective economic activity, which presented information in figures (Trigo et al., 2016). According to this definition, accounting is the general system of information about the economic unit.

To track accounting activities, the AIS is associated with the IT resources and internal management's decisions, including non-financial transactions directly affecting the processing of financial transactions, and consists of three major subsystems (Trigo et al., 2016): 1. Transaction Processing System; 2. Financial reporting system; and 3. Management reporting system.

The transaction processing system is to support daily transactions, and aims at automating business processes, demonstrating that the AIS is the first information system to support business activities (Hall, 2010). The financial reporting system is an integrated system that summarizes the transactions and reports a form or list on the status of the organization's financial resources (Rom & Rohde, 2007). The management reporting system that is a management information system, connects the internal management to specific financial reports, and provides information for making decisions such as budget.(Vidal Carvalho et al., 2016)

The information provided by the accounting information system to decision makers is accurate and reliable, and decision-makers largely use such information (Alewine et al., 2016). The deployment of information systems often requires substantial investment. For such an investment, there can only be one goal, i.e. the end user's satisfaction inside or outside the organization (Ebrahimi, Kord Lor et al., 2013). User's satisfaction will also be met if the AIS is complete.

2.3. History and Progress of the Accounting Information System

Nasab Najar and Babaei (2012) classified the accounting system history in Iran into five periods: before Islam, after the advent of Islam until the Qajar period, from the Qajar period to the Constitutional Revolution, from the Constitutional Revolution to the early 1960s, and from 1960s to present. Today,

countries are passing through the maturity and progress stages of their information system. The evolved system contains five hierarchical levels: elementary, elementary management, model definition, quantitative management, and optimization (Proença & Borbinha, 2016).

Maturity models are useful tools for evaluating the actual status of an organization and deducing and prioritizing its progress measures. The maturity model consists of a series of maturity levels for a group of purposes. The lowest level indicates the early status of the organization and the highest level represents maturity. Progress on the evolution path involves incremental progress according to the capabilities and facilities of the organization. The maturity model acts as a measure for assessing the status on the evolution path (Wilner, 2016).

Several maturity models have been presented so far, the most famous of which in the field of information technology evolution in today's organizations is Nolan model, called the Theory of Nolan's stages. Nolan and Koot (1992) describe the philosophy of the theory of the stages as follows: The progress of information technology in an organization is carried out through some stages. Each stage has its own specific problems in the field of information systems, users, technology, staff, and management tools. Hence, the management approach to be used should be different for each stage (Wilner, 2016). The Nolan's development stages are described by four IT development processes that determine the development and transformation of information technology in an organization. These processes are as follows:

- Existence of applications, including automated information systems of the organization
- Users, including user satisfaction of information services and their positive perceptions of these technologies
- Resources, including the quantity, quality, experience and knowledge of the staff, as well as the extent of efficiency and effectiveness of existing technology;
- Management, including the organization, measures, and procedures needed to control the supply of information (Matrane et al., 2015).

2.4. Maturity of the Accounting Information System

Making efforts to improve the indicators of information technology and information systems such as ease of access to hardware and computer, software and the Internet, citizens' level of software, hardware, and Internet literacy is considered as an important component of programs accelerating economic growth, reducing poverty, and employment at a macro level. Also, the quantitative and qualitative expansion of the presence of the citizens of each country in cyberspace is considered as a representative of their culture and their attempt to influence the international arena (Hashem Khani, 2012). This indicates the global significance of the information systems maturity and evolution. The AIS is also one of the information systems, which is of no exception. In addition, the recent trend of management accounting has changed from short-term planning and control based on historical information to a prospective strategic planning and control (Rahnama Roudposhti et al., 2016). Thus the components of management accounting should be considered for a long term. One of the important components of management accounting is its information system, whose evolution and maturity needs to be considered for long-term planning.

In order to manage the evolution of the information system, one should measure its maturity stages and its indices. To this end, the performance appraisal was raised, through which the managers get aware of the extent of reaching predetermined goals, compare the current status of the organization with its past trend, assess its status in comparison to the competitors, and identify the weaknesses and strengths in order to handle them. (Laserda et al., 2018). In the past, performance appraisal only considered financial issues; however, other factors are now included. The major difference between the information system projects and the other projects is the intangibility of their assessment indices (Yasuda, 2005). These intangible indices should be assessed. After assessing the indices, the current status and application of the AIS are developed based on the status quo. In the Nolan's model as a general model, the organizational factors or components are divided into four categories: Growth process and user position, data processing organization, data processing scheduling, user affairs.

In his research, Hosseini Rad (2014) mentioned that human resources, procedures and instructions, data and software have the greatest impact on the success of the accounting information systems. Abdali Laraki (2017) also counted the other components of the accounting information systems as follows: Staff: Users of accounting information systems; Methods and Instructions: Processes of collecting, managing and storing financial data; Data: Data related to the organization and its business processes; Software: Software program for data processing; IT Infrastructure: Information systems and networks that allow the relevant users have access to accounting information system; Internal controls and security measures: system security issues to protect data. According to Gelinas Ulric J (2002), the accounting information system encompasses the components such as technology, databases, reporting and control, event processing, decision making and management, operation and system development, communications, and accounting and auditing principles. Table 1 shows the maturity models of the information system along with their main factors.

Table 1: IS Maturity models and main factors

Models						
Heidari 2017	**Gelinas Ulric J 2002**	**Abdali Laraki 2017**	**Wilner et al. 2016**	**Koehler et al. 2015**	**Hosseini rad et al. 2014**	**Nolan Life Cycle 1992**
Users	users	Staff	People	Individual	Staff	User affairs
Data and base	Data and base	data	processes	Processes and standards	data	Data processing organization
Organization and management	Operation and development	methods	Database	data transfer	Procedures	Data Processing Planning
Development and growth	Communications and technology	Infrastructure	Organization	System support	Software	Process
Software	Decision making and management	Software	Strategy	Management		Development and growth
Network and hardware	Control and accounting principles	internal control				
Control and security						

Source: Researcher's findings

2.5. Research Questions

1) What factors and indices are effective for the AIS maturity assessment in large manufacturing industries?
2) What factors and indices are used for the AIS maturity assessment in the manufacturing industries of Markazi province?
3) Based on their relationship and impact, how are the AIS assessment measures classified for manufacturing industries of Markazi province?

3. Methodology

The present research was correlational in terms of its methodology and applied in terms of its objective. The statistical population consisted of two groups: A limited number of professors and scholars in finance and accounting with expertise and experience in AIS (n=45), who determined the preliminary indices effective in the AIS maturity assessment; and financial, accounting and auditing managers and financial and accounting experts in the manufacturing industries of Markazi province, who were assessed to be 288 persons in the accounting and finance units of large organizations. Using the Cochran formula, the sample size was calculated to be 194.

$$n = \frac{N Z_{\frac{\alpha}{2}}^2 \delta}{N-1\, d^2\, N Z_{\frac{\alpha}{2}}^2 \delta} \qquad (1)$$

At the significance level of 5%, $Z_{\alpha/2}$ is 1.96 and ε^2=0.035.

N shows the population size (N=288) and σ is the standard deviation for the first 30 distributed questionnaires (σ =0.19).

$$n = \frac{288(3.84)0.19}{287(0.00122)288(3.84)0.19} = 194.5 \qquad (2)$$

Using regular clustering method, 250 questionnaires were distributed, of which 196 questionnaires were collected. To develop the questionnaire, AIS maturity factors and components were identified and categorized after studying relevant articles, resources, and models. Then, more complete factors and indices were extracted from their aggregation and the questionnaire was prepared by deleting the common points (the questionnaire contains factors and indices of Table A in Appendix). After preparing the questionnaire, the comments of the first statistical group were used and their corrective comments were also considered. The reliability of the questionnaire with regard to the professors and experts' comments using Cronbach's alpha was estimated to be 0.867, which indicates an acceptable reliability. The revised questionnaire was distributed as the final version of the questionnaire among the second group. Descriptive and inferential statistics were used to describe and identify the effective factors and to classify the indices. Factor analysis method was used to select important variables and correlation test was then run to determine the correlation between the selected indices and the AIS maturity. Finally, factor analysis was run to select more important indices with relevant categories. Statistical analysis was performed using LISREL software version 8.5.

4. Results

Data analysis was carried out based on the answers to the research questions.

First question: What factors and indices are effective for the AIS maturity assessment in large manufacturing industries?

Several studies (e.g., Davern & wilkin, 2010; Khajavi & Etemadi, 2010; Nikroe & Salimifard, 2014, Snyder & Halpern, 2010; Koehler et al. 2012; Ghazanfari et al., 2011, Hariri, 2013, Alewine et al. , 2016; and Delak, 2016; Kim et al., 2017, Vidal et al., 2016) were considered to extract the factors and indices for the AIS maturity assessment.

After extracting and classifying the factors and indices from the abovementioned resources, nine factors and 70 indices were identified.

Second question: What factors and indices are used for the AIS maturity assessment in the manufacturing industries of Markazi province?

The AIS maturity assessment factors and indices were selected using factor analysis is performed, which determines the number of effective factors based on factor loads. To run the factor analysis, KMO and Bartletts tests were first performed to determine the capability of factor analysis. The test results presented in Table 2.

Table 2: KMO and Bartlett test results

Kaiser Meyer's Criterion	0.867
Bartlett's statistics	534.455
Degrees of freedom	53
Level of significance	0.000

Source: Researcher's findings

The KMO test value varies between 0 and 1. If KMO<0.50, the data will not be suitable for factor analysis, and if its value ranges between 0.50 and 0.69, it should be interpreted with caution. On the other hand, if KMO>0.70, the correlations of the data will be appropriate for the factor analysis. As presented in Table 2, this value is 0.867, indicating the data suitability for factor analysis. Bartlett's test examines the hypothesis that the matrix of the observed correlations belongs to a population with uncorrelated variables. If the assumption indicating that the variables are not correlated is rejected, the data are suitable for factor analysis; otherwise, no factor analysis can be run. In this table, sig. < 0.05 (sig = 0.000) so that the hypothesis of correlation between the variables is rejected and factor analysis can be performed.

Third question: Based on their relationship and impact, how are the AIS assessment measures classified for manufacturing industries of Markazi province?

In order to investigate the causal relationships among the variables, a confirmatory factor analysis was used. The relationship between the items and the variables is presented by using factor loads. The model factor loads in the standard estimation mode show the effect of each of the factors in explaining the variance of the hidden variable or the main factor. When the impact of variables is specified, a test of meaningfulness should be run. To this end, t-test was performed. Since the significance is checked at the error level of 5%, if the observed factor load based on the t-test is not within [+1.96, -1.96], the effect is significant. Fig. 1 shows the structural model of the factors based on the path coefficients and Figure 2 presents the structural model based on the t-value.

Goodness of fit test for the structural model
Table 3 shows the fit value for the selected indices in the structural model.

Table 3: Fit indices for the study variables

AGFI	GFI	P-value	RMSEA	df	χ^2	Indices
0.84	0.87	0.000	0.080	27	68.77	

Source: Researcher's findings

$\frac{\chi^2}{df}$: The value of this index should be <3. The smaller the index is, the fitter the model will be. In this model, the index is 2.54 so that the model is acceptable. The acceptable value of the root mean square error of approximation (RMSEA) ranges from 0.05 to 0.08. In the diagrams depicted in this study, this index is 0.080, indicating an acceptable value. The goodness of fit index (GFI) is 0.87, presenting an appropriate value. The AGFI is 0.84, which is also acceptable.

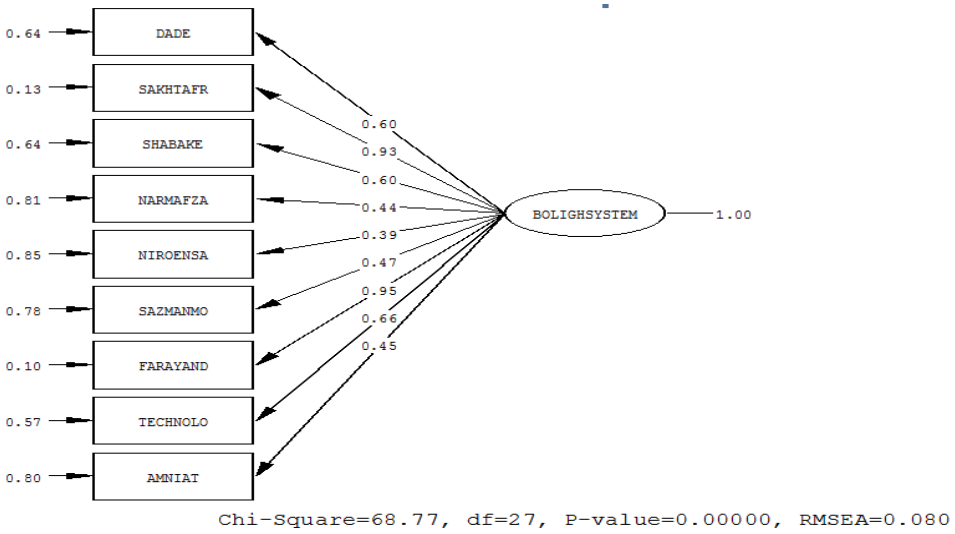

Figure 1: Relationships among the variables in terms of path coefficient
Source: Researcher's findings

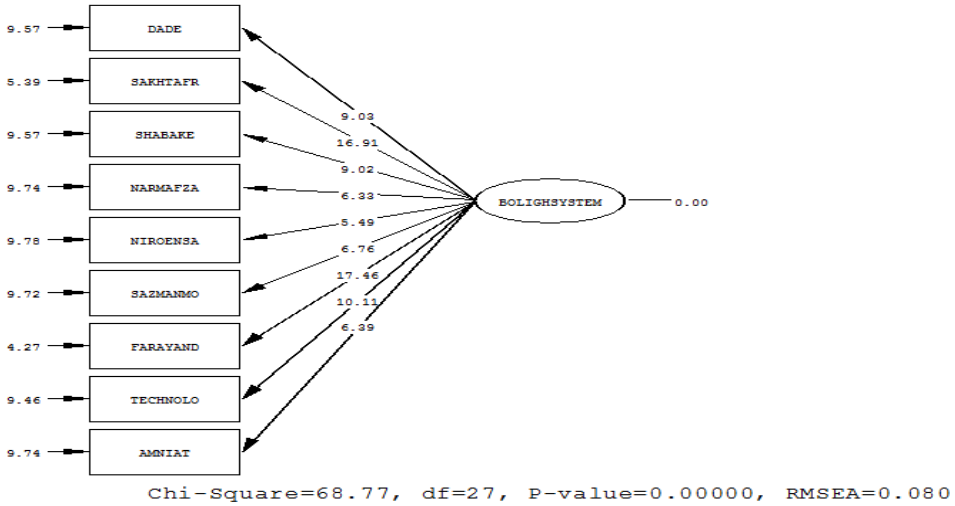

Figure 2: T-value for relationship between the variables
Source: Researcher's findings

In the structural model, the effect of each independent factor on the dependent variable is shown. According to the graphs, the effect of independent factors on the dependent variable is depicted in Table 4.

Table 4: Structural model results

Measures of AIS maturity	Structural model relationships		Results		
	Dependent variable	Independent variable	Path coefficient	t-value	Result
First	AIS maturity	data	0.60	9.03	Confirmed
Second	AIS maturity	Hardware	0.93	16.91	Confirmed
Third	AIS maturity	Network and server	0.60	9.02	Confirmed
Fourth	AIS maturity	Software	0.44	6.33	Confirmed
Fifth	AIS maturity	Human resource	0.39	5.49	Confirmed
Sixth	AIS maturity	Organization and management	0.47	6.76	Confirmed
Seventh	AIS maturity	Financial process	0.95	17.46	Confirmed
Eighth	AIS maturity	Information technology	0.66	10.11	Confirmed
ninth	AIS maturity	System security	0.45	6.39	Confirmed

Source: Researcher's findings

4.1. Confirmatory Factor Analysis for AIS Maturity Indices

After determining the factors influencing the AIS maturity, it is necessary to determine the effective indices for each factor. Indices in Table A are defined by the questionnaire questions and factor analysis was used to determine the factors with relevant indices. To run factor analysis, the commonality is first determined through examining the commonalities of each question with all of the questionnaire items. In this regard, the variables (items) with a commonality value <0.50 are removed from the analysis, respectively. Table 5 shows the contribution rate of the indices.

According to Table 5, the following items with a contribution value <0.50 are removed from the questionnaire: 3, 4, 5, 10, 13, 14, 17, 19, 20, 21, 23, 24, 26, 27, 30, 31, 32, 33, 38, 40, 41, 42, 43, 46, 47, 53, 54, 55, 56, 60, 61, 63, 64, and 68. Thus, out of 70 indices, 34 indices were removed and 36 indices were remained, which were included in the questionnaire No.2 and re-numbered 1 to 36 to be used for the second group of the participants.

Table 5: The contribution rate of the indices

Questions	Eigenvalues	Questions	Eigenvalues	Questions	Eigenvalues	Questions	Eigenvalues	Questions	Eigenvalues
Q1	.871	Q15	.539	Q29	.601	Q43	.430	Q57	.731
Q2	.731	Q16	.519	Q30	.423	Q44	.716	Q58	.575
Q3	.387	Q17	.483	Q31	.499	Q45	.597	Q59	.871
Q4	.470	Q18	.611	Q32	.388	Q46	.419	Q60	.325
Q5	.266	Q19	.434	Q33	.454	Q47	.403	Q61	.418
Q6	.512	Q20	.460	Q34	.722	Q48	.543	Q62	.583
Q7	.778	Q21	.481	Q35	.607	Q49	.887	Q63	.442
Q8	.703	Q22	.783	Q36	.793	Q50	.857	Q64	.302
Q9	.758	Q23	.348	Q37	.750	Q51	.633	Q65	.653
Q10	.479	Q24	.393	Q38	.424	Q52	.607	Q66	.780
Q11	.586	Q25	.833	Q39	.656	Q53	.390	Q67	.801
Q12	.544	Q26	.311	Q40	.438	Q54	.367	Q68	.337
Q13	.334	Q27	.454	Q41	.486	Q55	.495	Q69	.823
Q14	.419	Q28	.681	Q42	.356	Q56	.375	Q70	.507

Source: Researcher's findings

4.2. Determining the Number of Available Indices for Each of the Factors

The interpretation of the factor loads without rotation is not simple; therefore, the indices are rotated to enhance their interpretability. This technique aims at simplifying the columns of the factorial matrix; therefore, the variables with a high load factor are reduced to a limited number. In fact, the sum of the changes made to the factor loads is maximized to the extent possible so it is expected to find in extremely large or small factor loads close to one or zero in each column, respectively. In general, most statisticians prefer this rotation technique to other ones. By referring to the rotated matrix of the indices, the variables (items) associated with each one are identified and each question is linked to its relevant factor in a row. The items of each factors are presented in Table 5.

Based on the results obtained in the presented analyses, the model of the AIS maturity factors and indices for manufacturing industries is shown in Table 6.

Table 5: Assigning indices to AIS maturity factors

	Components								
	System security	Information technology	Financial and accounting processes	Organization and management	Human Resources - Users	Software	Network and server	Hardware	Data
Questions of each factor	Q33	Q28	Q23	Q20	Q16	Q13	Q10	Q7	Q1
	Q34	Q29	Q24	Q21	Q17	Q14	Q11	Q8	Q2
	Q35	Q30	Q25	Q22	Q18	Q15	Q12	Q9	Q3
	Q36	Q31	Q26		Q19				Q4
		Q32	Q27						Q5
									Q6

Source: Researcher's findings

Table 6: AIS maturity factors and indices for manufacturing industries of Markazi Province

Factors	Index / component
data	Data Access Speed
	Accuracy of the provided data
	Data sharing capability
	Creating compound data
	Data security
	Maintaining data independent
Hardware	All users' access to hardware
	Hardware appropriateness
	Quality and power of hardware
Network and server	Connecting the entire organization to the network
	network power and continuity
	Server and network support
Software	Software quality
	Continuity of software
	Software integration among organizational units
Human Resources - Users	Commitment of human resources
	Personnel's access to system documentation
	human resource expertise

Factors	Index / component
	Human resource skills
Organization and management	Having regular processes and performing tasks
	Documentation and standardization of activities
	Planning for the management and development of the system
Financial and accounting processes	The quality of accounting processes in data collection
	The quality of accounting processes in data analysis and processing
	The quality of accounting processes in the data and information distribution
	The quality of accounting processes in data completion and reproduction
	Quality of accounting processes in data control
Information technology	Internet speed
	Internet quality
	Website quality
	Appropriate access to the Internet and website
	IT support
System security	Security standards and policies for the system
	Security mechanisms such as controlling user access levels
	System security in terms of manipulation protection
	Security against hackers and robots

Source: Researcher's findings

5. Discussion and Conclusions

Management accounting provides the accounting information required by managers to make informed business decisions through connecting to the accounting information systems. Obviously, a mature accounting system can provide timely and relevant information to the management accounting, managers, and other users. Reviewing the research literature in this article, the factors associated with AIS maturity assessment were identified. Then the factors and indices were categorized and provided to the samples in the statistical population and tested by factor analysis. Based on the analyses performed to answer the research questions, the research objectives are as follows:

The factors and indices noted in assessing the AIS maturity were identified from the literature and factor analysis was used to select 36 effective indices for the major manufacturing industries in Markazi province. Using the Eigenvalues and percentage of variance for each factor in the factor analysis, the 36 effective indices were classified into nine factors: Data with 6 indices, hardware with 3 indices, network and server with 3 indices, software with 3 indices, human resources with 4 indices, organization and management with 3 indices, financial and accounting processes with 5 indices, information technology with 5 indices, and security with 4 indices (According to Table 6).

Using the structural equations, the effect of each AIS maturity assessment factor and index was determined. The results revealed that the financial and accounting processes had the greatest impact on the AIS maturity assessment.

Out of 70 indices, 34 indices were eliminated, a majority of which have been introduced as the AIS maturity indices; however, they were removed in this study since these indices had no direct effects or were dependent on the other subsystems. For example, in the human resource factor, the indices human resource motivation and human resource productivity were dependent upon human resource management and organizational policies so that they were eliminated.

The research factors and indices were identified based on seven models and carried out in the large manufacturing industries of Markazi Province. Caution is necessary when generalizing the findings to the other settings. Moreover, a questionnaire was used to carry out research, which has its own limitations.

Large manufacturing organizations are recommended to develop the accounting information system models in their organizations based on the influence of the factors and indices determined in this study. The other organizations are also suggested to

determine and assess the AIS maturity factors and indices based on the procedure and analyses adopted in this research.

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