



Experts	18	38
Supervisors	22	47
Total	47	100

3.2. Conceptual Model

In this study, conceptual model (Figure 1) contains: formalization, integration, utilization (as independent factors) and Performance Measurement System (as independent variable).

Figure1: Conceptual Model

3.3. Research Hypotheses

The hypotheses with regard to the conceptual model of the research are as follows:

- 1- There is a correlation between formalization and PMS.
- 2- There is a correlation between integration and PMS.
- 3- There is a correlation between utilization and PMS.

3.4. Validity and reliability of measurement instruments

Validity refers to rightfulness and correctness (Khaki, 1378, 288). Reliability or validity means that the measuring instrument measures the extent to the desired attribute. To measure the validity of different methods, we should consider its importance for the poor measurement that can trump any scientific research due to its worthless. To

increase the reliability and validity of master degree, we discuss top experts and experts and the questions due to eyes modification. 30 questionnaires were distributed to each variable in the statistical population and all ambiguities were identified and corrected. Thus, some questions were deleted and replaced with some other experts' digits mentioned finally in the view of the clarification and then the final questionnaire was distributed.

The following instruments were used to improve the content validity of the questionnaire:

- 1- Using the comments of some professors, senior specialists and experts in the fields of industrial engineering and management.
- 2- Similar questionnaires, articles, books, and magazines.
- 3- The initial distribution of questionnaires among some of the directors and top experts and assistants working in different parts of TONDAR 90 Deputy, Iran Khodro Company.

3.5. Reliability (reliability) of the questionnaire

Reliability analysis is to validate the accuracy and reliability of the interpretation and the words of the phrase. If a measurement tool is suitable for trait variable, at the same time, we consider another place that achieved for similar results. In other words, a reliable and valid instrument means that the property equally has reproducible and quantifiable results (Hafeznia, 1377, 155). In this regard, Cronbach's alpha was used to estimate the reliability of this technique.

There are multiple responses to a questionnaire which are, in fact are examined in recommended test. The method used to calculate the internal consistency of the characteristics, is using measuring instruments. As said, if the alpha coefficient is greater than 0.7, the test of reliability is acceptable.

a-Cronbach relationship is:

$$\alpha = \frac{N}{N-1} \left[\frac{S_t^2 - S_i^2}{S_t^2} \right]$$

Si2: Total Variance

α : Cronbach's alpha coefficient

St2: total variance

N: Number of questions (Sarmad, Bazargan and Hijazi, 1385, 169).

Table3. Cronbach's alpha values for factors of study.

Row	Questionnaire	Cronbach's alpha values	Fisher statistic value
1	PMS	0.72	0.7537
2	formalization	0.75	1

3	integration	0.81	.03817
4	utilization	0.87	0.3582

Table 3 shows that the Cronbach's alpha values for all factors are greater than 0.7, so reliability are confirmed.

3.6. Fuzzy TOPSIS Technique

Topsis (prioritization method respecting similarities) has been known as one of MCDM classic methods that was developed by Hwang and Yoon in 1981 to solve problems. It was based on ideal determination. Chosen alternative should have the shortest distance from positive ideal and on the other side longest distance from negative ideal(Hwang & Yoon,1981).using this model in Iran has been started in early 1370(solar Iranian calendar) and its use has limited to recent years.(Hwang &Yoon, 1981).

Decision making steps through Topsis –phase technique is as following:

Step 1- gaining weight vectors $w \sim j$

Step 2- normalizing gained matrix by asking experts in relation to strategies that is following matrix:

$$\tilde{R} = [\tilde{r}_{ij}]_{m \times n}$$

Related to interest standards

$$\text{(formula 2) Related to interest standards } B \subseteq \{1, \dots\} \quad (1)$$

$$\text{(formula 3) Related to cost standards } C \subseteq \{1, \dots, n\}$$

$$\tilde{r}_{ij} = \left(\frac{a_{ij}}{d_j^*}, \frac{b_{ij}}{d_j^*}, \frac{c_{ij}}{d_j^*}, \frac{d_{ij}}{d_j^*} \right), \quad j \in B \quad (2)$$

$$\tilde{r}_{ij} = \left(\frac{a_j^-}{d_{ij}}, \frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}} \right), \quad j \in C \quad (3)$$

Step 3: So the weighting matrix is like following fomula:

$$\tilde{V} = [\tilde{v}_{ij}]_{m \times n}, \quad i = 1, 2, \dots, m, \quad j = 1, 2, \dots, n$$

$$\tilde{v}_{ij} = \tilde{r}_{ij} \otimes \tilde{w}_j \quad (4)$$

Step 4: determining Fuzzy Positive Ideal Solution (FPIS) (\tilde{v}_j^*) and Fuzzy Negative Ideal Solution (FNIS) (\tilde{v}_j^-) (5,6 formula)

$$\tilde{v}_j^- = \begin{cases} \min_{i=1, \dots, m} \tilde{v}_{ij}; j \in B \\ \max_{i=1, \dots, m} \tilde{v}_{ij}; j \in C \end{cases} \quad \tilde{v}_j^* = \begin{cases} \max_{i=1, \dots, m} \tilde{v}_{ij}; j \in B \\ \min_{i=1, \dots, m} \tilde{v}_{ij}; j \in C \end{cases}$$

$$FPIS = \{\tilde{v}_j^* \mid j = 1, \dots, n\} \quad (6)$$

$$FNIS = \{\tilde{v}_j^- \mid j = 1, \dots, n\}$$

:step 5: calculation of size distances by fuzzy Oghlidos distance

$$D(\tilde{a}, \tilde{b}) = \sqrt{\frac{1}{4} \left[(a_1 - b_1)^2 + (a_2 - b_2)^2 + (a_3 - b_3)^2 + (a_4 - b_4)^2 \right]} \quad (7)$$

:distance of each strategy from positive ideal is calculated by formula 8

$$d_i^* = \sum_{j=1}^n d(\tilde{v}_{ij}, \tilde{v}_j^*), i = 1, \dots, m \quad (8)$$

:distance of each strategy from positive ideal is calculated by formula 9:

$$d_i^- = \sum_{j=1}^n d(\tilde{v}_{ij}, \tilde{v}_j^-), i = 1, \dots, m \quad (9)$$

Step 6: calculation of relative proximity to ideal and ranking (formula 10)

$$CI_i = \frac{d_i^-}{d_i^- + d_i^*}, \quad (10)$$

From combination of analysis of strong and weak points, opportunities, threats and Topsis-Fuzzy in 2008 by Celik et al. (2008) for writing and prioritization of strategies in 5 important ports of Turkey namely Ezmir, Mersinm, Heydarpassa, Embarli and Jampor was used. Six strategies, one for all ports and five for each one for one port were suggested and their performing caused a high increase in structural dimension of Turkish ports among European ports (Celik et al, 2009). Because of deficit information or unavailable information in real world, data aren't usually absolute; but often are fuzzy. So in this study, it was tried to use Topsis method with fuzzy data in order to dimension

1. Fuzzy Negative Ideal Solution

prioritization of main affective factors on PMS (case study: TONDAR 90 Deputy, Iran Khodro Company). Examined standards are used for prioritization of mentioned sub-scales of affective factors on PMS. Fuzzy values of verbal factors for acceptability of each alternative has been shown in table 4(Chen, 2000).

Table 4: verbal factors for weight determination of standards or scales

Very little	VL	(0, 0, 1, 2)
little	L	(1, 2, 2, 3)
Less than average	ML	(2, 3, 4, 5)
Average	M	(4, 5, 5, 6)
More than average	MH	(5, 6, 7, 8)
great	H	(7, 8, 8, 9)
Very great	VH	(8, 9, 10, 10)

4. Data Analysis

In this part of the study, we try to be proportionate to the objectives and methodology of research (surveys) using statistical techniques to quantify hypotheses.

4.1. Kolmogorov-Smirnov Test

This test is done to check the normality of data distribution and was used in the statistical community. The results obtained from the use of these tests are presented in Table 5.

H0: The population of normally distributed data sets.

H1: The population distribution of abnormal data sets.

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