

## Designing And Evaluation Model Productivity For Tourism Industry With System Dynamics

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*Many of the Iranian cities have unique historical, environmental and cultural potentials for tourism. Tourism industry could have a very vital role in political, financial, religious, social and economical situations of Iran and Iranians. To increase the productivity of tourism, it is essential to find a model to assess this productivity. The philosophy of improving the productivity in an organization enhances its employees, thoughtfulness, creativity and efficiency. Investments will be well planned and the quality of products will improve. Therefore, this study was performed to design a model to assess the productivity of tourism industry in Iran. For this we used a System Dynamics method. We assessed many parameters that affect tourism in Fars province and examined the relationship between those parameters. A model named Productivity Diagram for Tourism in Fars province was designed. The model was performed and analyzed. The findings were ranked and the desired findings were selected to assess the productivity of tourism industry in Iran. To perform the assessing model, we used simulating software called Vensim.*

**Key words:** *productivity, Evaluation of productivity, Tourism industry, System Dynamics*

### 1-Introduction

Tourism officially formed in Iran at the second decade of last century. The first office of tourism in 1935 called "reception office of foreign tourists and propaganda" in the Ministry of the Interior was established to tourism affairs office. In 1941 the "reception office of foreign tourists and propaganda" was renamed to "Supreme Council of Tourism". In 1954 the "Supreme Council of Tourism" transformed to "Tourism Affairs office" and established in the Ministry of Country. In July 1974 this office was transformed to the Ministry of Information and Tourism. After the Revolution in 1978, the Ministry of Information and Tourism was renamed, first "Ministry of National Guidance" and then "Ministry of Islamic Guidance" and finally to "Ministry of Culture and Tourism" and now "Cultural Heritage and Tourism" that it is one of the organizations managed under the President's office (Darvish Motavali, 2005).

Economic evaluation of the tourism industry helps to provide the necessary information for to formation of tourism development policies. These policies determine the framework required for a country to achieve the most appropriate type of tourism production. The Economic Analysis of Tourism is vital for the global economy. Tourism affects many aspects of the economy, such as employment, human resources, development, international trade and etc (Vela and Birchil, 2005).

Tourism industry can harvest considerable foreign exchange income. In addition, the tourism industry has significant affects on: the national income, transfer of the wealth and income from the deployment areas to tourism target areas, emersion of the market discrimination (dual), changing the consumption patterns of the host region, controlling domestic prices and inflation, increasing domestic value of money and affecting the employment rate (Mosae, 2007).

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Tourism as a major economic factor can assist with the expansion of employment in a way that both simple workers with no skills and those with different skills can be employed (Rezvani, 1995). Tourism can redirect the centers of heavy population from big cities to small villages (Dibaee, 1992).

Desire to understand the phenomena and knowledge of the unknown are amongst the main features of human being. Journey and travel can be reflexions of the above features (William, 1994). There would be no tourism, if there is no culture to promote and facilitate the tourism. Tourism can not only affect the culture but revive the forgotten cultural heritage of the host community, a phenomenon that would not always be welcomed by the host community (Bana Darvish, 2004). Tourism from the social-cultural viewpoints has been studied more by academics and scientists around the world these days compared to the past, because tourism not only affects the economical and political but also the social and cultural characteristics of different countries (Murphy, 1995).

Although tourism contributes to employment and economic development, it can also have some negative environmental and social impacts on the host community such as: resource consumption, pollution and wastes generation, disruption or destruction of local cultures, use of drugs and prostitution (Sigala, 2008).

## **2- Productivity**

The term of productivity for the first time was used by Fransova Kene, one of the mathematician and economist who was an advocate for physiocracy (Nature's State). Kene presented the table of economic plan and believed that the power of each state depends on the ability to increase its agricultural productivity (TaHERi, 2007).

Productivity is equal to the amount or product value divided by the value of one of the factors employed for the production. Therefore, different terms such as productivity of capital growth, labor force and production materials could be employed (TaHERi, 2007).

Significant increase in productivity in some countries in the recent decades has caused the promotion of national productivity levels as a priority for Iran (TaHERi, 2007). Consideration to the productivity and its importance in production has been considered as a serious matter in Iran from the beginning and this has lead to a comprehensive quality management (Najaf Beigi, 2004).

In fact, scientific management is a solar system of skills and knowledge necessary to increase productivity in collective activities. It is also a regular and logical effort for innovation, establishing and enforcing policies, systems and methods which will lead to an effective leadership to transfer resources into goods and services with minimum waste, and maximum efficiency (Kazemi, 2007).

Companies and organizations that their productivity is higher than the average productivity in a particular industry, usually have higher profit. Also, if the productivity of a company increases faster than the productivity of adversaries, gains margins of that company will increase. On the other hand, organizations that their productivities is under average productivity in the industry, and their productivity growth rate is under other companies competing with, they will eventually become bankrupt (TaHERi, 2007).

### **3-System Dynamics**

Trying to represent and visualize World's realities is not something new. It is an innate characteristic of human being and his curiosity about the world and the need to understand and control natural phenomena to try to make models of his world's realities. In fact, the new science began when the mathematical models were applied to express many of natural, social, industrial, agricultural and other phenomena. These models have found many applications even in many branches of social sciences, including linguistics and Anthropology these days. Experts are using mathematical models to explain the natural phenomena and social life characteristics. (HamidiZadeh, 2000).

The challenge that we are facing now is that how we can move from accelerated learning and systematic thinking to the tools and processes that could help us to understand the complexity of these systems, design better operating policies and guide us through the smallest to the largest changes in our systems. We are all like passengers of an airline that our duty is not just to get on the flight but to design the flight (Shahgholian, 2007).

Dynamic system is an approach that would help to solve the problems that senior managements encounter (Farester, 1968) Dynamic system studies should consider seven steps including defining the problem, providing the concept of the model, model formulation, simulation, evaluation for developing the models, analysis of policies and use of the models (HamidiZadeh, 2000).

After making an intellectual model it is necessary to determine the connections between its components and parameters. The model should then be executed and evaluated. For this purpose system Dynamics use the following three stages:

#### **3-1- Causal Loop**

After designing the intellectual model, Causal Loops are drawn. Causal Loop Charts determine the causal relations between two or more variables and the directions that those variables affect each other (HamidiZadeh, 2000). Causal Loop Charts are important tools to display the feedback structure of systems and have been used for many years by academic researchers. These charts are being increasingly employed in the commercial and trade sectors.

#### **3-2- Flow Diagram**

After converting an intellectual model to causal loops, we need to convert the casual loops to flow diagrams to be able to execute the model. These then could be performed and developed by computer softwares. Flow diagram can show flow structure and systems accumulation. Accumulation and flows along with "feedback" are the two main concepts of dynamic systems theory (Shahgholian et al., 2007).

#### **3-3- Simulating Software (Vensim)**

After converting an intellectual model to causal loops and then flow diagrams, we used Vensim software is used to simulate and execute the model. The mathematical equations and values for each parameter are entered in this program and then the desired analysis of the model is performed and the results would be collected.

### **4- Evaluation of productivity**

In this study, using concepts of productivity and the main parameters affecting the system dynamics, we evaluated the productivity of the tourism industry of Fars province. The main parameters influencing productivity are including incomes, expenses, investments, production and services, and human resources. A change in any of these parameters could affect the other parameters as well as productivity. To determine other contributing parameters, we reviewed the scientific and theoretical basis of parameters resulting main parameters. The information about each parameter has been considered based on the data reported at the end 2008. The analysis of the desired level is designed for the years between 2009 and 2019 that is studied for (a ten-year range).

### 5-Analyses of Productivity Model

Based on the initial intellectual model that is displayed as Causal Loops and by studying the literature, some parameters were identified which lead us to design the final model for the Tourism industry in Fars province. This Model is shown in Figure 1. There are 3 loops in this model two of which have positive polarity and one has negative polarity. Now study the diagram in Figure 1, which is causal loop.

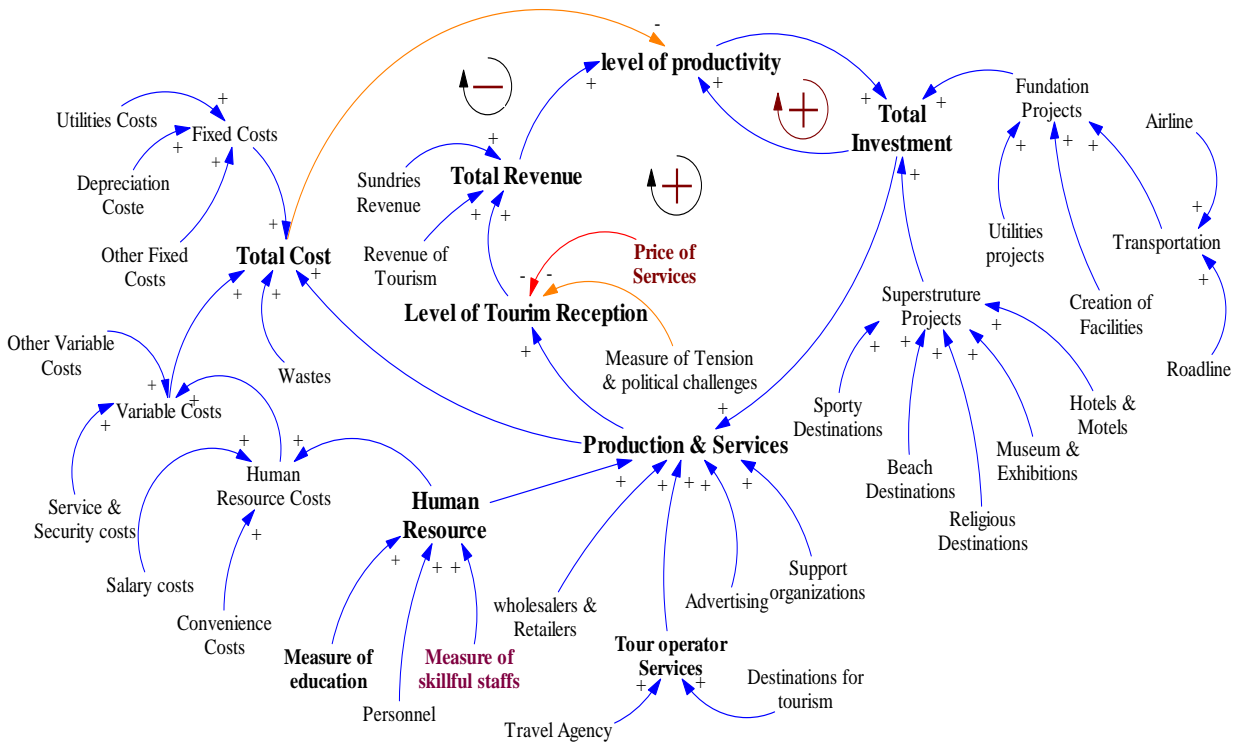


Figure 1: The Productivity Model in Tourism Industry of Fars Province - Causal Loops.

On the other hand, Figure 2 which was plotted in Vensim software shows the Flow Chart Diagram of our model. The final charts and diagrams were plotted using Vensim.



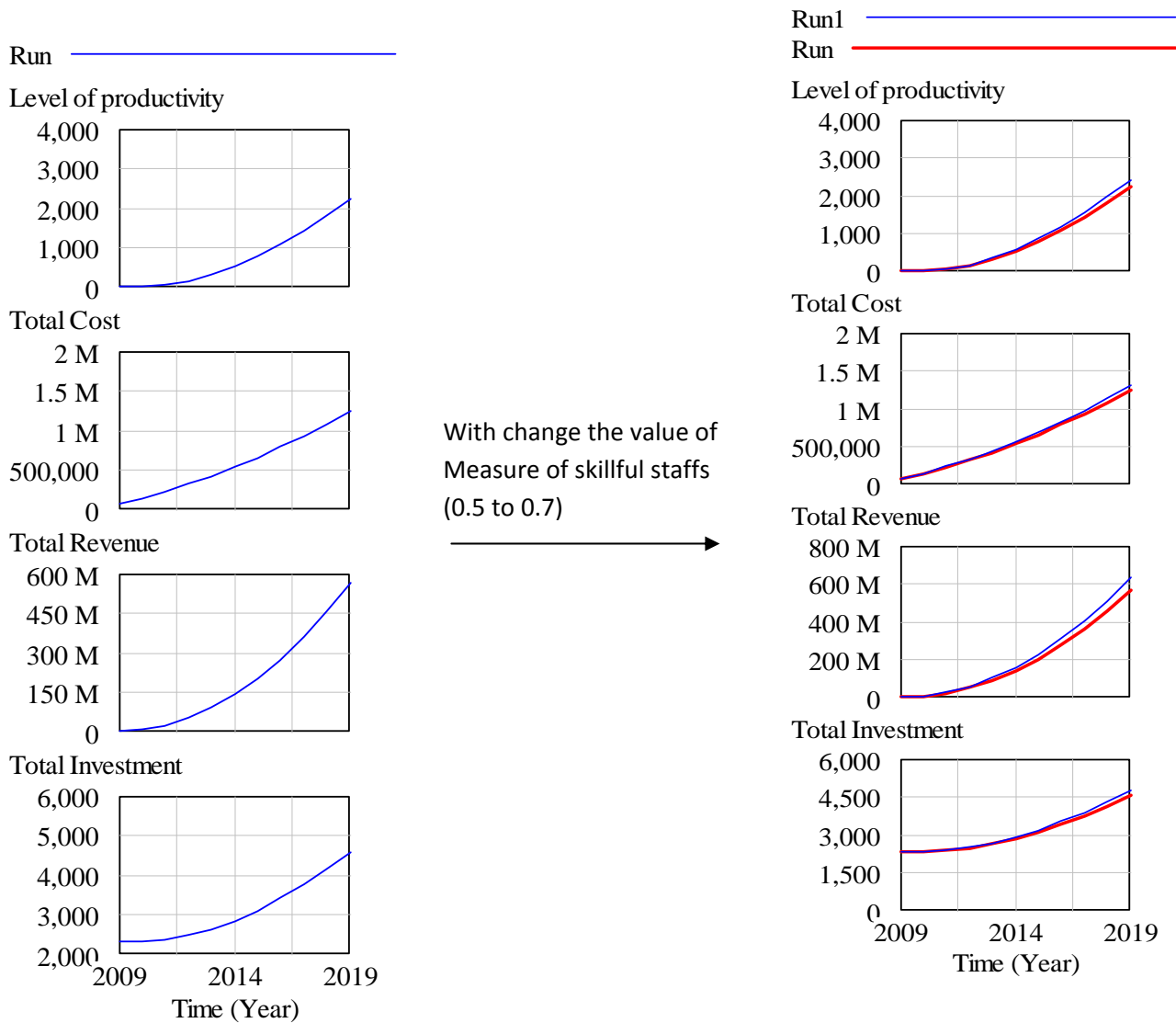


Figure 3: charts of running the productivity model of tourism industry

The relevant figures and tables clearly show the impacts of each component on the model. We observed that with the increase in the absorption rate of skilled workers, production and total income and consequently productivity increased.

### 6-Conclusion

This study was designed to find a method to evaluate productivity in the tourism industry in Fars province. According to the model that was designed during this study (As shown in Figure 2), a set of factors and components influence the tourism industry over the time. These factors are classified in five main parameters including income, costs, investment, production and work force. Each of these parameters also includes some sub-parameters. In this study, all these parameters were identified and extensively studied. In the process of the design and completion of our model, we also defined that how different parameters are related to each other. Using the proposed model, we could assess productivity of the tourism industry in Fars province between 2009 and 2019. In the other words, the proposed model is able to not only evaluate but to predict productivity for ten years. Productivity in today's tourism industry has become an undeniable necessity. However, because tourism industry has many potentials and weaknesses, it has no choice but to increase its productivity. The productivity evaluation is a way that can help managers of tourism industry to improve their productivity.

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