



## The business model in the hospitals affiliated to Iran University of Medical Sciences

Aida Asghari<sup>1\*</sup>, Aidin Aryankhesal<sup>1</sup>, Nader Tavakoli<sup>2</sup>, Fataneh Hashem-Dabaghian<sup>3</sup>, Seyede-Elahe Hosseini<sup>4</sup>, Masoud Abolhallaj<sup>5</sup>

<sup>1</sup>Department of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran.

<sup>2</sup>Trauma and injury research center, Iran University of Medical Sciences, Tehran, Iran.

<sup>3</sup>Research Institute for Islamic and Complementary Medicine, School of Persian Medicine, Iran University of Medical Sciences, Tehran, Iran.

<sup>4</sup>School of Health Management and Information Sciences, Isfahan University of Medical Sciences, Isfahan, Iran

<sup>5</sup>Educational Deputy, Ministry of Health and Medical Education, Tehran, Iran.

### Abstract

**Background and objective:** Business model is an effective factor on organizational productivity. Present study was conducted to investigate the current state of productivity and business model of hospitals in the Iran University of Medical Sciences (IUMS).

**Methods:** This cross sectional study was conducted in the hospitals affiliated to IUMS, during 2017-2018. In the present study, 102 managers from 15 hospitals were included; they completed a 47-item questionnaire, which evaluated the product presentation and innovation, infrastructures and customers' relationship. The data for productivity consisted of the bed occupancy ratio, bed turnover interval and the length of stay; they were obtained from deputy of treatment of IUMS. Data were analyzed by SPSS software, using Chi-square, Mann-Whitney U and Kruskal Wallis Tests.

**Results:** Mean  $\pm$  standard deviation of bed occupancy ratio was  $79.46 \pm 11.9\%$  (moderate level), bed turnover interval was  $6.28 \pm 1.61$  days (poor level), and also the length of stay was  $4.17 \pm 1.53$  days (moderate level). The scores of total questionnaire and its subsets were  $121.8 \pm 29.45$  ( $P=0.45$ ),  $58.46 \pm 15.96$  ( $P=0.01$ ),  $25.53 \pm 6.77$  ( $P=0.011$ ) and  $37.8 \pm 9.32$  ( $P=0.018$ ), respectively. There were no significant differences between the educational and non-educational hospitals or general and specialized hospitals, regarding the productivity indicators and the business model subsets ( $P>0.05$ ).

**Conclusion:** The productivity in the cited hospitals was at moderate to poor levels; the business model was not at an ideal position. Changes in business model or its proper implementation and applying strategies to improve productivity, should be considered in these hospitals.

**Key words:** Business model, Productivity, Hospital, Iran

### Background and objective

The business model is a relatively new concept; no scientific research has been conducted about this issue, prior to the 1990s<sup>1</sup>. The scientific literature on "business model" is scattered, and definitions with relatively incompatible structures make this term more complicated<sup>2</sup>.

Patients need flexible, accessible, affordable and high quality health services, while practitioners focus on improving health; policymakers and health care managers try to balance costs with quality of services. Patients' experience, the quality of health care services and their costs are the three major aims in the health system, which seem very difficult to be achieved<sup>3</sup>.

A business model could help managers and policymakers to understand how different organizational aspects and activities could be better aligned to achieve the aims<sup>4</sup>. Business models could therefore help health care organizations to use innovative approaches for care delivery<sup>5</sup>. Currently, there is no clear consensus among scholars on the business model definition, but a recent review showed, that many heterogeneous understandings are converging<sup>6</sup>.

\*Corresponding: Aida Asghari  
Email: [aida.asghary@yahoo.com](mailto:aida.asghary@yahoo.com)

The literature reveals a growing interest for business model applications in the health care, particularly in the last decade. Application of business model thinking in the health care has grown in the recent years. Business model thinking has a clear role in helping the organizations to align more strategically with the internal and external contexts<sup>4, 7-9</sup>.

Change is an inevitable phenomenon in most organizations, including hospitals; hospitals must adapt to new needs in order to stay competitive and successful, and retain patients<sup>10</sup>. In the present era, with economic growth and technological changes, some organizations adapt the necessary changes to create a favorable environment<sup>11</sup>.

Hospitals are always under the pressure to reduce costs and increase the quality of services, so they must pay special attention to the principles of their business model in order to survive. By applying the principles of business management, health care organizations strive to achieve continuous improvement of various processes and gain many benefits. The right business model leads to lower costs, higher revenue, higher employee motivation, greater customer satisfaction and higher overall productivity<sup>12</sup>.

According to Osterwalder, the business model consists of four parts: product or service, customer relationship, infrastructure management and financial resources; each of these elements has components. The product element includes the present value, and the customer interface includes the distribution channel and relationships. The infrastructure management element also includes value configuration and capability, and the financial

resources element includes the cost and revenue model<sup>4</sup>.

The final goal of proper management in the health sector is to increase productivity of health services, such as shortening the duration of patients' hospitalization, preventing the occurrence of hospital infections, increasing coverage of health services, promoting public health awareness, preventing financial loss and finally creating the acceptable financial health and economic discipline<sup>13</sup>.

Today it is very important for hospitals' managers to have a correct, clear and common understanding of their business model and its components; it is the source of competitive advantage, and helps them to change their business model to increase productivity<sup>10</sup>. The present study was conducted to investigate the current state of productivity and business model of hospitals in Iran University of Medical Sciences (IUMS).

## Methods

This cross sectional study was conducted in 2017-2018. The study population was the total managers of 18 hospitals affiliated to IUMS. Three hospitals were excluded; Motahari and Iran Psychiatric hospitals were excluded due to fundamental differences in the concept of productivity, and Shaheed Rajae Heart hospital due to lack of cooperation. Psychiatric and Motahhari Hospitals are specialized hospitals for burns; they are different from other hospitals due to the differences in bed occupancy rate and bed turnover, and the length of patients stay is much longer than other hospitals in IUMS.

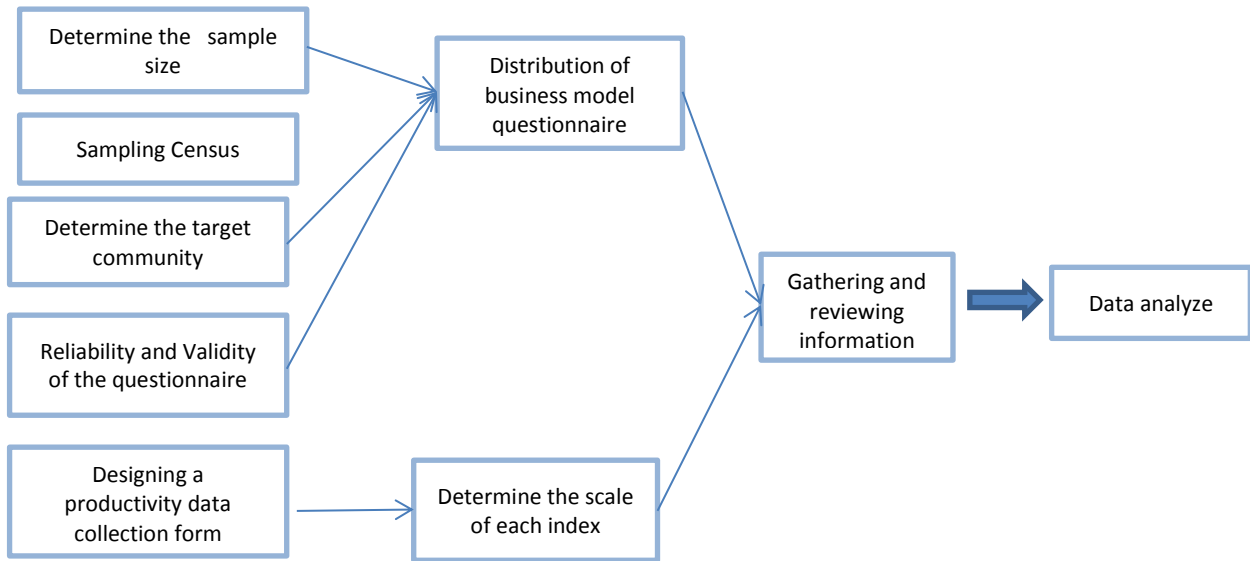


Figure 1. The flow diagram of the study

According to sadeghzadeh .etal study business model section includes product components, customer, infrastructure management and dimensions of available

value, target customer, distribution channel, communication, value configuration, capability and partnership<sup>14</sup>. Conceptual model is shown in figure 2.

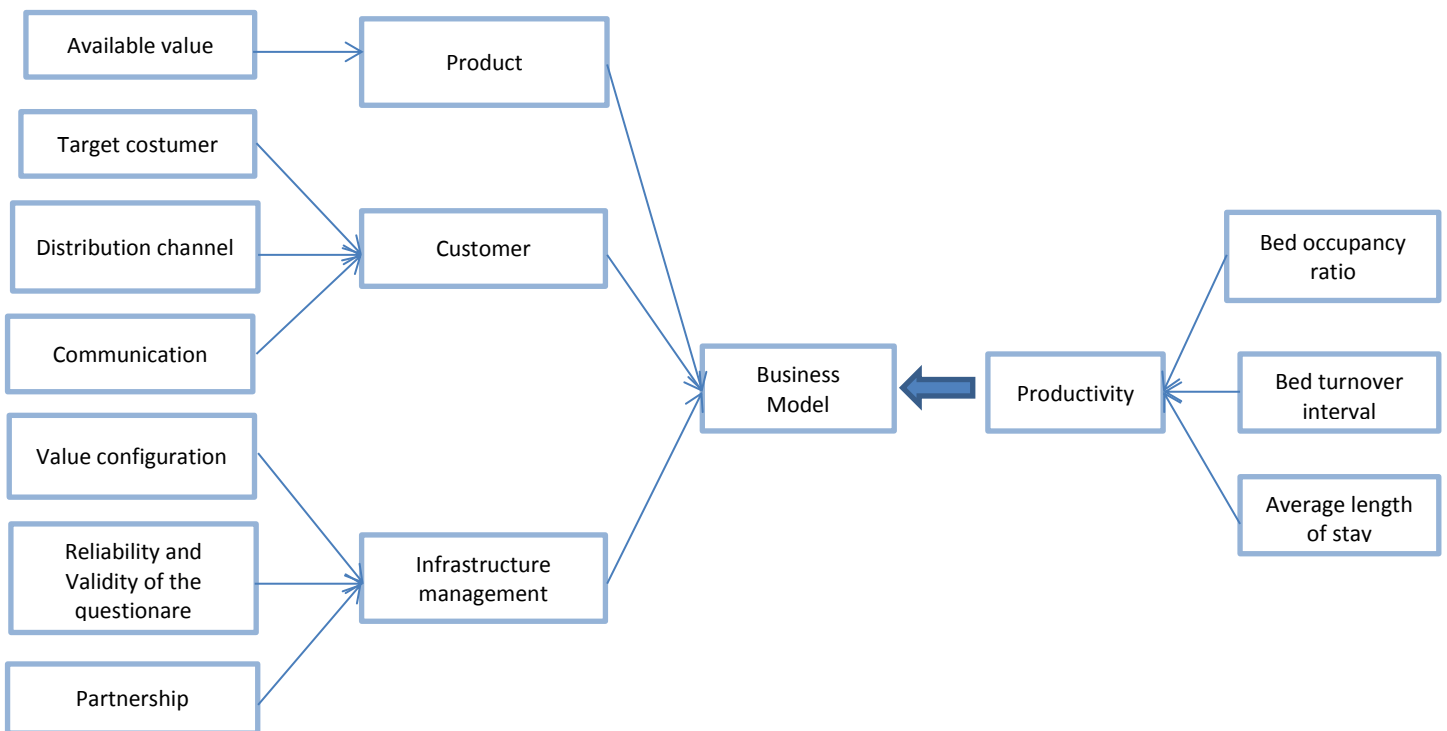


Figure 2. Conceptual model

The data for productivity (bed occupancy ratio, bed turnover interval and the length of stay) of hospitals were obtained from the

deputy of treatment of IUMS. The classification of productivity is shown in table 1.

Table1- productivity, indicators and classification

Indicators	Poor	Moderate	Good
bed occupancy ratio	<65%	65%-85%	>85%
bed turnover interval(day)	>5	3-4.99	<3
Average length of stay(day)	>5.1	3.1-5	1-3

To evaluate the business model, a 47-item questionnaire was used. The business model questionnaire has been designed and validated by Foroughifar *et al.* (2006), based on the Strawlader's business theory. It consists of three dimensions including product presentation and innovation (24 items), infrastructures (12 items) and customers' relationship (13 items). Seven components of the questionnaire included deliverable value (Product or service), target customer, distribution channel, communication, capability (Ability to execute a pattern of actions, that are essential in creating value for the customer), value configuration (Arranging activities and resources, which are necessary to create values) and partnership value (Partnership and cooperation with other organizations)<sup>14</sup>.

The answers are based on 5-option Likert scale scored from zero (no way) to four (very high)<sup>13</sup>. The range of scores is 0-96 for innovation, 0-48 for infrastructures, 0-52 for customers' relationship and 0-196 for the total questions. The reliability of the questionnaire was also approved in the present study, by alpha Cronbach's as 0.97.

The heads and managers of hospitals, nursing service managers, department managers and clinical and non-clinical managers of hospitals wards were included in this study, through census sampling method. Demographic variables of the managers and characteristics of hospitals were collected using a checklist, and the business model questionnaire was completed.

### Statistical analysis

The collected data were analyzed using software SPSS version 18. Mean (standard deviation) and frequency distribution were used to describe the data. Chi-square, Mann-Whitney U and Kruskal Wallis Tests were used to compare the variables between the groups.

### Results:

In this study, 102 managers from 15 hospitals completed the questionnaires. Among these, 9 (60%) of the hospitals were educational hospitals and 7(46.7%) were general hospitals. Table 2 presents the participants' characteristics.

Table 2- The participants' characteristics

	categories	Number (%)
age (year)	30<	9(8.8)
	31-40	35(34.3)
	41-50	41(40.2)
	51>	17(16.7)
sex	female	66(64.7)
	male	36(35.3)
position	clinical	67(65.7)
	Non-clinical	35(34.3)
education	Bachelor	69(67.6)
	Master	29(28.4)
	Ph.D.	4(3.9)
Field of study	clinical	74(72.5)
	Non-clinical	28(27.5)
History of working (year)	1-5	46(45.1)
	6-10	28(27.5)
	11-15	17(16.7)
	15<	11(10.8)

The productivity was not significantly different between the hospitals ( $P=0.45$ ). The current situation of the hospitals is moderate for bed occupancy ratio and the average length of stay; it is also poor for bed turnover interval. Table 3 presents the productivity indicators of the studied hospitals.

**Table 3.** Productivity indicators

	minimum	maximum	Mean(SD)	P value	Current situation
Bed occupancy ratio (%)	62.00	96.00	79.46(11.09)	0.45	moderate
Bed turnover interval (day)	3.33	9.41	6.28(1.61)	0.45	poor
Average length of stay (day)	2.06	8.06	4.17(1.53)	0.45	moderate

The scores of the total questionnaire of business model were not significantly different between the hospitals, but the scores of the three parts of the questionnaire were

significantly different between them. The results of the business model questionnaire are presented in table 4.

Table4- The business model from the perspective of hospitals' managers

hospital	Number of managers	minimum	maximum	Mean(SD)	P value*
1	6	83.00	150.00	117.5(25.14)	
2	11	73.00	147.00	115.18(22.32)	
3	5	87.00	155.00	111.40(30.81)	
4	7	65.00	196.00	129.28(41.16)	
5	7	116.00	196.00	147.85(25.58)	
6	7	73.00	144.00	99.00(25.88)	
7	5	97.00	164.00	135.60(24.3)	
8	11	91.00	137.00	116.63(12.57)	0.450
9	5	82.00	123.00	102.60(17.11)	
10	6	101.00	158.00	123.00(20.43)	
11	3	93.00	133.00	118.00(21.79)	
12	4	122.00	167.00	146.25(18.48)	
13	7	66.00	181.00	106.28(37.41)	
14	8	39.00	154.00	110.87(37.63)	
15	10	117.00	183.00	148.00(23.80)	
	102	39.00	196.00	121.80(29.45)	
Total	innovation	18.00	96.00	58.46(15.96)	0.010
	Infrastructures management	9.00	44.00	25.53(6.77)	0.011
	Customers' relationship	12.00	56.00	37.80(9.32)	0.018

\*Kruskal Wallis Test for comparison between 15 hospitals,

In addition, there were no significant differences between the educational and non-educational hospitals, or general and specialized hospitals regarding the productivity indicators and the business model subsets ( $P>0.05$ ).

## Discussion

Due to the sensitivity and vitality of the processes in the health care organizations, application of the business model is more complicated. This study examined the business model with three dimensions of product presentation and innovation, infrastructure management and

communication with customers in hospitals affiliated to IUMS.

According to the study results, the business model and organizational productivity were not at an ideal situation, and both of them should be improved. The mean scores of business model questionnaire and its subsets were in the range of "higher than average", but they are far from the ideal state.

In the studied hospitals the business model was not given enough attention or was not properly implemented. Improving the business performance in hospitals improves the productivity status of the hospitals. According to a study by Zand Hesami et al., a successful business model provides a

successful way to serve customers and bring more profit to the system. A significant part of the success of hospitals is related to the design of their business model<sup>15</sup>.

According to a study by Niroomand et al., business models provide the basis for common understanding, business-related analysis and business management improvement; they also create clear vision and exclusive rights. With adopting a business model and new designs and ideas, hospitals can provide the ground to enter new business market, which allows them to maintain and improve their hospitals' positions in the national and international markets<sup>16</sup>.

If we have an appropriate business model, we can provide the right services and products, resulting in more customers' attraction to the organization and increasing profits and productivity in the system. Having a good business model does not mean to succeed in the business, but certainly lacking a good business model is a guarantee of the business failure<sup>17</sup>.

The product presentation and innovation is a very important and key dimension of business model in the organization. When there is no innovation for products and services, customers do not desire to receive services from the organization, and practically the hospitals will fail<sup>10</sup>.

In the issues of service delivery and service innovation, the following items should be considered: delivering distinctive services from other hospitals, designing and delivering new services, providing counseling services if needed, delivering high quality services beyond the patients' expectation, completing and developing the first-line services<sup>18</sup>.

Jafari et al. showed that infrastructure management in governmental organizations is always at low level, perhaps because of the government's organization and government intervention in the hospital management<sup>19</sup>.

According to Pakdel's study, if the business model is appropriate and well-implemented in the hospitals, it will increase customers'

satisfaction and relationship between the customer and organization, thus increases the customer loyalty and improves the productivity. The business model focuses on the customer; it can increase profits in the organization by attracting the customer<sup>20</sup>.

Customers are the focus of any business; the preferences of the patients should be taken into consideration in the hospitals<sup>21</sup>. Patients have special attention to the effective communication of the hospital staffs with them<sup>22</sup>.

Productivity is a very complex concept; it affects all governmental organizations and social institutions. This study showed that productivity of the studied hospitals of IUMS was in the moderate to poor status. The factors increase productivity in different organizations are almost similar; but the combination and priority of factors affecting productivity in industrial, manufacturing and service organizations are different, due to the characteristics of the internal and external environment of these organizations.

Improvements in the productivity and quality are not accidental, but it is the result of a conscious process. Regarding the management factor, the productivity will improve in the hospital by application of the appropriate hospital equipment technology, appropriate business model, and etc.<sup>23</sup>.

High productivity is the main source of economic growth and development, and is achieved only in the light of improvement efforts; therefore, it can be said, in order to achieve the higher level of productivity, the business model proportional to the internal and external environment should be constantly updated; it allows hospitals to compete with other health centers in today's competitive environment to attract more visitors, and provide high quality services for customers, and capture a significant part of the market<sup>24</sup>.

**Limitation:**

Lack of support from managers to fill out the questionnaires and gathering the data were the limitations of this study.

**Conclusion**

The indicators of productivity in hospitals affiliated to IUMS were at moderate to poor level. The business model in these hospitals was described in this study, which was not at the ideal position or had not been implemented properly.

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**Conflict of interest:**

None of the authors had any conflicts of interest

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