



# Digital Technology in the Management of Quality Service in Tourism Business

Sergii Nezdoyminov, Ganna Bedradina, Andrii Ivanov

**Abstract:** *The objective need for quality management has identified the special role of digital technology in booking services, information and communication systems in the tourism business. The quality of services is one of the most important components of the efficiency and profitability of the tourism industry in the current conditions of tourism development. The quality management system of production processes in the tourism sector should be a continuous process of measures aimed at improving the level of services, improving production elements and introducing innovative technologies. All the processes of designing, ensuring and maintaining the quality of tourism products should be integrated into the quality management system. It has been established that the consistency between the priorities of the enterprise in the field of improving the quality of services and the goals of the overall set of business processes is a condition for the effective and long-term development of the enterprise. The authors determined that modern management and modeling of business processes in enterprises, speed and quality of customer service require a specialized software product developed exclusively for the needs of the tourism industry. Based on the methods of financial analysis, the authors of the article substantiated the economic feasibility of implementing Fox Manager BPA 2.5 software using the example of a travel company. The profitability index of the proposed software product will be 1.6. The estimated payback period is 1.7 years. The authors' suggestions are aimed at creating a modern workplace for sales managers and automation of internal office processes in a travel company using digital technology.*

**Keywords:** *Quality Service Technologies, Software Product, Tourism Industry, Quality Management.*

## I. INTRODUCTION

In the conditions of market transformations and increased competition in the market the enterprises of the tourism industry face an important problem associated with the introduction of innovative technologies of quality service and improving the efficiency of quality management services. One of the ways to solve this problem is to use the automation of all internal office processes in the tourist enterprise, using the latest achievements in the field of information technology and

quality management in order to create a competitive tourist product that can meet the needs of external and internal consumers, respond to market demand for quality services in a timely manner. The production of high-quality products contributes to an increase in sales volume and return on capital, reduces the unit costs of users and provides a more complete satisfaction of the needs of tourists. The question of choosing the optimal tools for optimizing the technological cycle of production of tourist services on the basis of modern information technologies is relevant, because the right decision regarding this issue will serve as the basis for successful quality management. The problems of innovative technologies for the formation of the quality system of tourist services and features of their implementation in the practice of quality management, are considered in the works of several authors: Marasco, A., De Martino, M., Magnotti, F. and Morvillo, A. [1], Camilleri, M. A. [2], A. Pazasuraman, V. Zeithaml, L. A. Berry [3], Tarun Kumar Singhal, Anubha Vashisht [4], Baumgarten, L. V. [5]. This direction is being formed in the research of Ukrainian scientists.

## II. JUSTIFICATION OF INFORMATION AND TECHNOLOGICAL MEASURES TO ENSURE THE QUALITY OF SERVICES

The quality of tourist service is a complex economic object of management, in which it is possible to allocate a set of subsystems operating separately, requiring the travel company to apply specific skills associated with the analysis and selection of providers who will directly implement the tourist product at a balanced level of quality for all its components. So, the main problem of quality tourist service is the choice of the service providers making a tourist product by the enterprise [6, p. 81]. As a rule, these providers are located at a distance from the enterprise and operate independently of each other. Therefore, in order to effectively manage the quality of tourist services, it is necessary to use the most modern methods of situational and heuristic management, multicriteria optimization methods and adaptive management methods that allow optimizing the composition of the tourist product in terms of quality and cost of services that form it. In our opinion, to manage effectively the quality of tourist services and increase productivity of staff it is appropriate to recommend that responsible executives implement an automated system of formation of the tourist services based on highly efficient information systems. The basis of such a system is a database that contains information on all potential tourism entities located in attractive countries for tourists. The expediency of the implementation of the proposed measure is that we take into account the basic provisions of the production of the tourist product and the needs of consumers.

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Objective formation of tourist needs is the starting point of the economic system, which is determined by the modern scope of tourism enterprises. In this dynamic system, there are four main links (subsystems):

- production of tourist services;
- formation of tourism product;
- implementation of the tourism product;
- consumption of tourist product.

For effective functioning of the tourist enterprise there is a need for development of the complex program of actions regarding the information and technological support for improvement of quality of tourist service. Empirical results of the researchers show that the advantages of different orientations of QM depend on the level of competition and the speed of change of the product [7]. The basis for the formation of activities is a conceptual model of the integrated quality management system of tourism services. We consider quality management of tourist services as a management activity in the conditions of dynamic demand and changes of the market environment that assumes definition of qualitative requirements to service, an assessment and control of qualitative parameters, development of actions for improvement of quality of a tourist product at each of stages of its life cycle. According to the standards of ISO 9000 series, a quality management system is a defined system of the development of policy objectives for the management and administration of the enterprise in relation to quality [8].

The objective necessity of formation of the complex of tourist services to fully meet the needs of tourists has also generated the special role of information technologies in booking the services, information management systems and the need to use a software product regarding the quality of the formation of tours in the activities of tour operators in the tourism economy, measure complete sentiment, and gathering feedback regarding new product and services [9].

In the modern theory and practice of quality management, great attention is paid to the process and methods of modeling (description) business processes as part of the enterprise and human resources management technology [10, pp. 43 - 66]. Business process modeling is an important component of business process reengineering projects and of the creation of large-scale software systems for the tourism industry. The main objectives of business processes modeling is the transformation of models "asis" (as is) to model "astobe" (as to be), understanding how acts (should act), the company to achieve its objectives [11, p. 102]. It is necessary to use integrated information and communication technologies in the field of destination tourist service [12, p. 75]. However, the introduction of management information systems still requires preliminary testing and evaluation of the effectiveness of their use in different sizes of travel agencies [13, p. 812].

For our calculations, we used the methods of determining the payback period and profitability index. The profitability index is a parameter of an investment project, which is used to evaluate its effectiveness. This indicator has no measurement and is a coefficient, although it can be expressed as a percentage. From an economic point of view, it shows the current value that will be obtained as a result of the project, per 1 conventional unit of initial investment.

### III. RESULT AND DISCUSSION

For modern management and business processes modeling in tourism enterprises, speed and quality of customer service, in our opinion, it is necessary to implement a specialized software product developed exclusively for the needs of the tourism industry. This product can be a software package "Fox Manager BPA 2.5", which is adapted to tourism enterprises, and that is meant to create a modern working place of office manager and to automate all internal office processes using the latest achievements in the field of information technology and quality management.

The introduction of this software product allows to automate the business process chains of the tourist enterprise, namely:

- a) saving time for managers and staff;
- b) simplification of work on registration of documentation;
- c) reducing the likelihood of errors in the work of personnel;

- d) prompt receipt of information in a short time.

The program automates the following basic functions:

- a) control of tours ordered by consumers;
- b) accounting of data of tourists and partners;
- c) formation of a full package of documents for tourists;
- d) ability to track tourist complaints;
- e) ease of reconciliation of payments with tourists and suppliers;
- f) saving time on reporting the statement of sales of tourism services.

The software package "Fox Manager BPA 2.5" allows for the travel industry the following set of tasks:

- a) to optimize the process of formation of offers of services and calculation of their final cost;

- b) form a single database, directories, accumulating information about partner companies, tourists, advertising audience, booking requests and payments for them, offers and their details (various additional services), exchange rates, etc;

- c) enter and control payments, both client and partner. At the same time, all documents, orders, payments will be formed in the database and will be stored in the program, which will allow you to quickly obtain the necessary information in any analytical context and volume;

- d) to form a powerful analytical system that allows the manager and the executive responsible to see the overall picture of the demand for current offers, statistics of the most popular tours, to receive from the analytical unit reports on the work of the office, financial condition, monitor the effectiveness of advertising, the effectiveness of the manager for the analyzed period;

- e) reducing the time when making an application and simplifying this process by automatically issuing a full set of necessary documents: voucher, reservation sheet, incoming and outgoing cash orders, invoices, checks-orders and contracts that already contain all the data about the tourist and the selected service;

- f) the relationship of the selected automation system with other developments that are used both in the enterprise and in the market of tourist and hotel services:

search engines, global reservation systems, accounting programs, etc.;

g) drawing up price lists, conducting sales and booking of hotel services, formation and viewing of the schedule of programs of additional service of tourists, and also sales of blocks of places to travel agencies;

h) separation of staff access to different databases.

We will calculate the economic efficiency of the implementation of our proposals for improving the service quality at tourism enterprises of the city of Odessa on the basis of software product "Fox Manager BPA 2.5". The main source of financing is income from operating activities of the enterprise. The cost of purchasing the software product will be 30 thousand UAH. We predict that due to the introduction of this product there will be an increase in the net cash flow of the tourist enterprise by 20% of the volume achieved in 2018 and according to forecast calculations will amount to 20640 UAH. According to accounting data at the enterprise, the net operating cash flow for 2018 is 17.2 thousand UAH.

According to the Statement of Standard Accounting Practice 4 the cash flows mean the receipt and disposal of cash and cash equivalents. Cash comprises cash on hand and in bank accounts that can be used for the current operations of enterprises. Net cash flow from operating activities characterizes the amount of revenue from sales of products that remains at the disposal of the enterprise in a certain period after the implementation of all cash expenses of an operational nature. It serves as a criterion for assessing the internal potential of the enterprise financing. The sources of operating net cash flow are net profit, depreciation and increase in liabilities.

In the context of valuation of a software product, the discount rate characterizes the rate of return on invested capital and the rate of return after the forecast period, according to which, at the valuation date, the buyer can invest in the acquisition of the object of valuation, taking into account compensation for all its risks associated with the investment. Some businesses use an interest rate on loans or a planned rate, etc. To determine the discount rate and subsequent calculation, the account rate of the National Bank of Ukraine is used, that was 13.5% per annum as of 01.03.19. To justify the project of additional investments, we consider such an important investment indicator as the profitability index, which is used to assess the effectiveness of investments, business plans of enterprises, investment and innovative projects.

Index of profitability (eng. PI, DPI, Present value index, Profitability Index) - an indicator of the effectiveness of investments, which is the ratio of discounted income to the amount of investment capital. Other synonyms of the profitability index that carry a similar economic meaning are the profit investment ratio and the value investment ratio. The profitability index (PI) is understood as the value equal to the ratio of the present value of expected cash flows from the implementation of the project to the initial cost of investments:

$$PI = NCF / I \tag{1}$$

where NCF (net cash flow) is net cash flows (discounted);  
I – investment.

If *PI*:

- > 1 the project should be accepted;
- < 1 the project should be refused;
- = 1 the project is neither profitable nor unprofitable.

We would like to note that, in contrast to the net present value, the profitability index is a relative indicator (see table. I.)

**Table-I: Required investments per cash flow**

Investment in the project	Amount, UAH
year 0	30000
The income from the project	
1st year	20640
2nd year	20640
3rd year	20640

Source: calculated by the authors

Discounted cash flows in years are presented in table II.

Discount factor:

$$\frac{1}{(1 + 0,135)^k} \tag{2}$$

**Table II: Discounted cash flows in years**

Period	Discount factor	Amount, UAH
1	0.8811	18185.022
2	0.7763	16022.045
3	0.6839	14116.339
CF		48323.407

Source: calculated by the authors

Net present value:

$$NVP = \sum \frac{CF_k}{(1+r)^k} - IC \tag{3}$$

$$NVP = -30000 + \frac{20640}{(1+0,135)} + \frac{20640}{(1+0,135)^2} + \frac{20640}{(1+0,135)^3} = 48323,407 - 30000 = 18323,407$$

Profitability index:

$$PI = \sum \frac{CF_k}{(1+r)^k} / IC \tag{4}$$

$$PI = \frac{48323,407}{30000} = 1,611$$

Let's consider the internal rate of return on an investment. The internal rate of return of investment, RR-synonyms: internal profitability, internal payback, usually means the value of the discount factor r, in which the NPV of the project is zero:

$$\sum \frac{P_k}{(1+r)^k} - IC = 0 \tag{5}$$

$$-30000 + \frac{20640}{(1+r)} + \frac{20640}{(1+r)^2} + \frac{20640}{(1+r)^3} = 0$$

The payback period is the minimum time interval from the beginning of the project, beyond which the integral effect becomes and remains nonnegative (table. III).

Table III: payback period in years

Period	PV <sub>t</sub>	Increasing PV <sub>t</sub>	DIC <sub>t</sub>	Increasing DIC <sub>t</sub>
0	0	0	30000	30000
1	18185.022	18185.022		
2	16022.045	34207.067		
3	14116.339	48323.407		

Source: calculated by the authors

In our case capital investments are equal to 30000 UAH. According to table 3, we can observe that 30000 UAH will be covered by the total results after 1 year. This is an approximate result, only in years. To clarify the payback period, we will calculate the period during which all investment costs will be covered after year 0.

Increasing  
 $DIC_t - PV_t = 30000 - 18185,022 = 11814,978$

Integral result for the 2nd year:  
 $PV_2 = 16022,045$  UAH for 365 days.  
 $DPP2 = 11814,978 / 16022,045 \times 365 = 269$  days.  
 Therefore, the payback period of the project will be:  
 $DRP = DRR1 + DRR2 = 1 \text{ year} + 269 \text{ days}$ .

We would also like to consider the definition of the marginal value of changes in income. In a situation where the investment project will have an integral break-even point, NPV is zero.

$$q_1 = \left(1 - \frac{DIC_t}{PV}\right) \tag{6}$$

$$q_1 = \left(1 - \frac{30000}{48323,407}\right) = 37,92\%$$

Therefore, the profitability index of the proposed project will be 1.611. The predicted payback period is 1.7 years.

IV. CONCLUSION

Information technology as a driving force for the effective management of business processes is an integral element of a tourism enterprise; therefore, it is advisable to present a software product that provides effective enterprise management in the field of improving the quality of services. The cost-effectiveness of implementing Fox Manager BPA 2.5 software is confirmed by our calculations. This will maximize the automation of all business processes to manage the quality of services in a travel company, using the latest advances in digital technology. In modern conditions of development of the tourism market, relations between enterprises, suppliers and consumers are affected by the certification mechanism of quality systems used to comply with the standards of the ISO-9000 series. The authors of this study believe that the main task of quality systems built on the basis of these standards is to ensure product quality in accordance with consumer requirements, and also in providing him with evidence of the company's ability to maintain such quality in the world of modern communication technologies. Accordingly, all the mechanisms of the quality management system, the methods and means used are focused on achieving this goal. The results of our research are aimed at improving the quality management mechanism of tourism services using digital technologies.

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