








## Evaluating E-Business Performance in Tourism Within the Digital Era: A Novel Information System Model

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### ABSTRACT

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*information, E-commerce, digitalization, cash flows, E-business, tourism, system*

In the evolving landscape of digital technology and global economic integration, the pivotal role of electronic business (E-business) in transforming traditional market structures and establishing new commercial paradigms has been increasingly recognized. This study focuses on the appraisal of E-business development amidst ongoing digitalization. Central to the investigation is the formulation of a contemporary information system model for E-business evaluation. The research delineates the essential factors influencing E-business progression and identifies potential improvement areas. The primary subject of this analysis encompasses the modern information and technological systems underpinning electronic business operations. Evidence suggests that the technical state of a fundamental intangible asset, namely the E-commerce website, considerably influences cash flow generation. Notably, site visitors, whether organic, referred, or paid, do not uniformly convert into customers. This study establishes various criteria for the model's construction and introduces a comprehensive metric: an integral coefficient reflecting the website's technical condition, which directly affects visitor-to-customer conversion rates. A novel methodology for assessing internal factors impacting E-business cash flows has been developed. This approach enables the evaluation of an enterprise's technical features and the identification of deficiencies impeding potential sales, using the integral site condition coefficient. This research makes a significant contribution by presenting an innovative information model for E-business assessment in the tourism sector.

## 1. INTRODUCTION

### 1.1 Background

In the dynamically evolving domain of tourism, which readily adapts to digital innovations, the imperative for devising an information system dedicated to the assessment of E-business has become increasingly pronounced. The digitalization phenomenon serves as a catalyst, revolutionizing traditional tourism methodologies and enabling businesses to elevate their customer engagement and process optimization. The conception and implementation of such a system are crucial for the strategic planning of enterprises aiming to consolidate their market presence, enhance service quality, and introduce cutting-edge tourism products.

The significance of this research lies in addressing the accelerated growth of E-business within the tourism sector. This growth is coupled with a deficiency in the financial management tools and methodologies necessary for effective cash flow management. Traditional methods for analyzing and evaluating cash flows in conventional marketing settings

prove inadequate in the E-business context. This novel business sphere is distinguished not only by its unique sales modalities of goods and services but also by the particularities in cash flow generation. Amidst the rapid expansion of E-business, the scrutiny of its financial activities, particularly cash flow analysis, gains paramount importance. Cash flows have emerged as a key performance metric, underpinning the enhancement of analytical and evaluative tools for E-business cash flows. Historically, the concept of E-business was subjected to critical assessment and debate in economic and legal discourse, lacking a definitive legal framework. Presently, E-business, particularly within small and medium-sized tourism enterprises, is increasingly being legislated, offering new opportunities for state registration and regulatory compliance. This legislative progression has catalyzed the development of analytical and evaluative tools for businesses in this sector.

Cash flows remain a pivotal financial category globally for assessing and analyzing E-businesses. The ongoing evolution of the IT industry and E-business underscores the growing significance of cash flow management. This study, therefore, focuses on elucidating the complexities of cash flow in E-

business, particularly within the tourism industry, proposing innovative tools and methodologies for their effective analysis and management.

1.2 Problem statement and study objectives

The primary challenge in the rapidly evolving E-business landscape is the market's high dynamism and unpredictability, significantly influenced by external factors. This volatility complicates the forecasting of income and expenses, thereby impeding accurate determinations of a business's financial robustness and growth potential. Additionally, the risks associated with monetary fraud and currency fluctuations necessitate continuous vigilance and strategic development to mitigate such risks.

Although cash flow in E-business has been extensively explored in both domestic and international literature, its unique characteristics in the context of electronic business, particularly through the lens of intangible assets requiring continual updates, have not been sufficiently examined. These characteristics yield distinct aspects in the formation, analysis, and evaluation of cash flows.

Over the past two decades, E-business has emerged as a crucial element of the global economy, incrementally contributing to world GDP (Figure 1). This increasing significance underscores the need for a more nuanced understanding of E-business cash flows within the tourism sector.

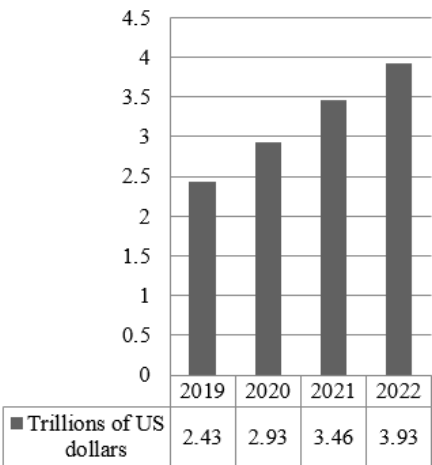


Figure 1. Importance of E-business in global GDP

The existing literature on the assessment of tourism E-business within the digital paradigm reveals potential gaps. The rapid evolution of technology and the tourism industry means that research findings from just a few years ago may now be outdated. The relentless progression of digitalization, coupled with emerging technologies like artificial intelligence, blockchain, and the Internet of Things, presents new opportunities and challenges for tourism E-businesses. These evolving dynamics have not been thoroughly explored in existing literature.

The objective of this article is to assess the development of E-business in the realm of digitalization, with a focus on the modern information and technical systems that underpin electronic business. The approach undertaken can be visualized as a road map comprising the formation of a methodological approach, identification of assessment parameters, and the establishment of an information platform

for conducting assessments.

The structure of this article includes a comprehensive literature review and its analysis, an exploration of the methodology with detailed descriptions of all methods employed in the study, presentation of the principal findings, and a discussion of these results in the context of existing literature, culminating in the formulation of conclusions.

2. LITERATURE REVIEW

2.1 Key literature on the selected topic

The conceptual scope of E-business, as delineated in the scientific and theoretical literature [1, 2], extends beyond mere commercial activity. It encompasses all business processes executed via the Internet, thereby defining electronic business as a profit-oriented relationship derived from remote transactions involving the creation, acquisition, modification, and improvement of civil rights and obligations, facilitated through information and telecommunication systems [3, 4].

In the domain of E-business cash flows, distinct formation characteristics are recognized [5, 6]. These are primarily attributed to the continual investments required for the development of electronic stores, such as content creation, product photography, site script adjustments, and video reviews. Although appearing operational, these expenditures actually enhance the state of an intangible asset (the electronic store), thus representing a perpetual initial investment in cash flow.

The integration of E-business within travel companies facilitates extensive data collection on consumer behavior, which can be leveraged to refine marketing strategies and tailor products more effectively [7, 8]. Digital tools like mobile applications and social media are instrumental in fostering customer communication and nurturing long-term relationships [9, 10].

The online information environment and search engines, as platforms for electronic store operations, exert a significant impact on cash flows [11, 12]. In this digital milieu, competition is fostered, and markets for goods and consumers are developed. To generate cash flows, electronic stores require a consistent influx of visitors, primarily sourced from search engines, third-party site referrals, social networks, and direct website links.

A general review of the literature [13, 14] reveals that E-business management strategies markedly diverge from traditional approaches. The Internet environment, characterized by heightened dynamism compared to conventional product markets, and the rapidly expanding pool of competitors, necessitates innovative methods to stimulate cash flow growth. Additionally, the efficiency, informativeness, and speed of customer service in E-business are pivotal factors influencing the return of customers for subsequent purchases, thereby playing a crucial role in the formation of cash flows [15, 16].

2.2 Identifying gaps in the existing literature

A critical analysis of the existing literature reveals notable gaps in the context of the development of E-commerce and E-business. Predominantly, these studies fail to incorporate modern methodologies that could facilitate the formation of specific models or systems. A salient weakness observed is the

lack of specificity in the scope of research, often neglecting to concentrate on particular industries, such as tourism.

While the breadth of topics covered in contemporary literature, ranging from information technology to E-business management strategies, is commendable for providing a holistic perspective, the diversity of methodological approaches poses challenges in comparing results across different studies. This inconsistency underscores the necessity for a unified, universally applicable approach.

Existing literature exhibits a significant deficiency in the in-depth examination of cash flows within E-business, particularly in the context of the digitalization of travel companies. Consequently, all established methods of analysis and evaluation necessitate adaptation to the specific conditions of E-business operations.

This study aims to develop an appropriate model that will enable the evaluation of factors influencing E-business development and identify potential areas for enhancement. It seeks to augment existing models, offering deeper insights into the dynamics and determinants of E-business valuation within the tourism sector. A critical observation is that current literature inadequately addresses the fundamental components of what constitutes an E-business assessment information model, indicating a need for a more clearly defined methodological approach.

### 3. METHODOLOGY

The main methodology of the article is the method of estimating internal factors. the question of the influence of internal (or microeconomic) factors on the activities of electronic stores in the scientific literature has not been sufficiently studied [17, 18].

Methods for assessing internal factors of influence are also different depending on the activities of enterprises, so each method has its own scientific and practical value (It was also possible to use the method of hierarchical ordering, but it has a number of disadvantages. First of all, what concerns the fact that there is active involvement of experts, and this is a very imprecise factor and a very subjective opinion can be obtained as a result).

The chosen method is valid because it is meaningful, criterion-based and constructive. Its reliability is characterized by checking time and consistency. It can be used by other researchers as well.

It should be noted that internal factors do not have a direct impact on E-business cash flows, but they do affect website traffic. To a greater extent, the generation of cash flows is influenced by internal factors.

In electronic business, there are special factors of influence that may not be noticeable at first glance, but as a result, have

a significant impact on the volume of proceeds from the sale of goods (works or services). These include: page loading speed; Mobile version of the site; design and graphic design; relevance of content to key queries.

Thus, thanks to this method, it will be possible to form an information model for assessing the technical state of the introduction of electronic business for a tourism enterprise. Key parameters are presented in Table 1.

The choice of this model is explained by the fact that if it is impossible to load the site at a certain moment, even with an ideal technical setup of the site, there will be no sales. Thus, to display the cumulative impact of all parameters on the site, it is proposed to calculate the integral coefficient of the technical condition of the site.

The integral coefficient of the technical condition of the site ( $k_{ts}$ ) is calculated by multiplying the parameters indicated in Table 1 in the coefficient expression Eq. (1):

$$k_{ts}=(p_{sp}/100)*(p_{mv}/100)*(p_{ta}/100)*(p_{gs}/100) \quad (1)$$

where  $k_{ts}$ : coefficient of the technical condition of the site, relative units;

$p_{sp}$ : the probability of buying on the site due to the speed of loading the site, %;

$p_{mv}$ : the likelihood of buying on the site due to the presence of a mobile version, %;

$p_{ta}$ : the probability of buying on the site due to text accompaniment, %;

$p_{gs}$ : the probability of buying on the site due to graphic support, %.

The  $k_{ts}$  coefficient takes a value from 0 to 1. If  $k_{ts} = 0$ , there will be no sales volume. If  $k_{ts} = 1$ , sales volumes are optimal. The normal value of the indicator is from 0.8 to 1. If the coefficient value is below 0.8, then the owners of the electronic store need to take measures to improve the site. What exactly needs to be improved is shown by the result of a technical audit according to the parameters indicated in Table 1. Any value of the coefficient below one means that the E-business is losing a certain percentage of buyers due to technical problems. Therefore, financial analysts and auditors have the opportunity to motivate owners to improve their project not only through the conclusions of the audit findings about the presence of problems, but also through the amount of losses from the shortfall in customer receipt in terms of value.

For evaluation, we have chosen a really operating tourist enterprise "TangoTravel". His choice was not accidental, since E-commerce has recently appeared in them and they need a new methodological approach to the formation of an evaluating model. Some of the authors of the article also worked there. For effective and accurate analysis, the management of the selected enterprise is provided with all data.

**Table 1.** Parameters of the information model according to the methodical approach

Page Load Speed	Not Loaded	More than 20 Seconds	5-20 Seconds	Less than 5 Seconds
Purchase probability, %	0	26.4	45.1	100
<b>Mobile adaptation of layout</b>	No mobile version	Inconvenient mobile version	Minor design notes	Quality mobile design
Purchase probability, %	22.2	45.1	89.5	100
<b>Text description of products</b>	Outdated or missing text	Text not search engines	Minor remarks on the text	High-quality and regular text content
Purchase probability, %	22.7	46.5	78.9	100
<b>Graphic arts</b>	Outdated design	Uncomfortable design	Minor design notes	High-quality graphic support
Purchase probability, %	29.6	49.11	91	100

## 4. RESULTS OF RESEARCH

Let's evaluate the technical characteristics of the site "TangoTravel", using the evaluation method proposed on the basis of the survey results in Table 2.

The average probability of a purchase on the TangoTravel website is 45.1% out of 100 possible due to the lack of a well-tuned mobile version of the site. It can be concluded that the site needs to implement measures to improve technical characteristics. As a result of their effective implementation, you can increase the conversion rate by 0.55 or 55%. Improving your website's SEO will not only help it rank higher in search engines, but will also provide better visibility and reach to your target audience.

In order for the conversion rate to grow, it is necessary to develop a mobile version of the site, create an appropriate mobile design and implement it in the Internet service. According to preliminary estimates, the cost of these measures will be USD 12000 (Table 3). These insignificant costs will allow the enterprise not to lose a part of the visitors entering into mobile devices.

An investment of \$12,000 can pay for itself in about 2-3 months. Please note that actual ROI may vary depending on many factors, including changes in traffic, seasonality of purchases, changes in user behavior, market competition and other economic conditions.

The direct information model of the system for evaluating electronic services is presented in Table 4.

According to Table 4, we can conclude that for

«TangoTravel» we need to make a mobile version, update the content and work with the ease of use of the resource.

Special mention should be made of technical aspects. Conducting a technical audit of a website may reveal technical problems, such as errors in the code, slow loading pages, broken links, etc., that require immediate resolution.

The proposed system for evaluating internal factors makes it possible to determine the relationship between the technical condition of the site and the number of buyers for the study period. In turn, it is not difficult to determine the dependence of sales volumes on the number of buyers; for this, the number of buyers must be multiplied by the price of goods, works or services (for E-business, the size of the average bill).

The results of the analysis are of practical importance, they can be used by auditors when analyzing the effectiveness of E-commerce. To date, the audit practice of electronic stores has not created a toolkit that allows you to measure losses from inefficient site settings. The conducted studies can provide an economic justification for the expediency of eliminating technical errors. This can be done by calculating the potential change in the level of conversion of visitors as a result of technical work to improve the site. By multiplying the conversion rate by the number of visitors and the size of the average check, you can determine the potential level of sales of goods, works or services. The "TangoTravel" example served to obtain more accurate data for the information model. The results may, with certain variables, be applicable to other tourism businesses and their systems. We have informed consent from the management of the company.

**Table 2.** The result of the technical evaluation of the site

Probability Factors	Indicator Data
Page load speed, %	100
Availability of website version mobility, %	45.1
Availability of relevant text content, %	100
Convenient design, %	100
Integral coefficient of the technical condition of the site	0.45
Potential increase in conversion rate	0.55

**Table 3.** Estimate of creating a mobile design for the site

No.	Type of Work	Executor	Price
1	Redesign of the mobile version	Outsourcing	3600
2	Layout of the mobile version of the site	Outsourcing	5500
3	Adaptation of the mobile version	Staff	2900
<b>Full price</b>			<b>12000</b>

**Table 4.** The information model of the system for evaluating electronic services

No.	Type of Work	TangoTravel
1	Page load speed, %	100
2	Availability of a mobile version of the site, %	45.1
3	Availability of relevant texts, %	78.9
4	Has a user-friendly design, %	49.11
5	Integral coefficient of the technical condition of the site	0.17
6	Potential increase in website conversion	0.83

## 5. DISCUSSIONS

As part of the discussion, it should be noted that our study should be compared with previous ones. For example, as a comparison, some scientists [19, 20] formed models of E-business development trends through the creation of appropriate information systems. Trends in changing fashion

for web design indicate that the appearance of the site must be updated at least once every 3 years. It is very important to study current trends in the development of payment systems. It is necessary to create the possibility of automated payment, which is made using simple, tested services. Social networks can become one of the regular suppliers of customers to an electronic store, so these systems cannot be neglected. For at

least a few more years, people will respond well to advertising on social networks, and therefore it can be safely used to develop an electronic store. In the direction of search engine optimization, the scope of work has no limit. It is possible to achieve the withdrawal of absolutely all possible keywords provided by the offer of goods to the first positions, and this requires constant expenditure of funds.

Other scientists [21, 22], as an example for discussion, form life cycle models, where they demonstrate and determine the place of E-business. The stage of the life cycle of an enterprise, depending on which the formation of cash flows occurs in different ways. Particularly for new businesses, cash flow generation starts with large investments. In addition, to launch an electronic site, it is necessary to create conditions for attracting visitors; this takes money, which forms a significant part of the outgoing cash flow. Unlike new enterprises, functioning ones are engaged not so much in bringing visitors as in converting them into buyers. The investment activity of such enterprises is insignificant, but constant and regular.

Another group of scientists [23-25], as a result, present models for the development of branding within the framework of E-business. The more the online store invests in branding, the higher the site conversion rate. Large companies try to get more buyers with the same number of visitors, for which work is regularly carried out to improve the service, call speed, speed and quality of delivery, etc.

Discussing our results, it should be noted that there are both common and distinctive features. For example, such an opinion regarding the essence of E-business and cash flows can be considered common. E-business cash flows are understood as the movement of funds that occurs due to the operation of an electronic store (service), which allows you to create cash receipts and spend them to ensure an uninterrupted business process in the Internet environment. The differences lie in the very methodical approach to analysis and results.

The key difference between the results presented by us is that the presented information model for analyzing the technical state of electronic business allows you to audit the weaknesses of the technical work of the site; explore ways to improve the e-shop; determine the potential growth in cash flows as a result of improving the technical work of the site. The result of our research clearly demonstrates that this is, first of all, an information model. We do not present "universal mechanisms" or approaches. We modeled with selected data and indicators (the very set of variables for the information model, where the author's vision of such a list is).

## 6. CONCLUSIONS

The study has limitations and they lie in the fact that the E-commerce system of only one of the industries was taken into account. Due to volume limitations, it was problematic to cover the specifics of E-business in each area. The consequences of this limitation is that the emphasis of the information presented in the article is only for the tourism business. The findings and recommendations may not be fully applicable to other sectors due to the unique nature of the industry being studied.

The practical value of the results lies in the fact that they can be used in electronic work and any tourism enterprise.

Prospects for further research should be directed to the formation of an effective evaluation system. The main purpose of assessing cash flows is to determine the solvency of the

enterprise, the effectiveness of assets and investments. In modern management systems used for corporate governance and E-business, in particular, these indicators should be examined in terms of cash flows. The most informative indicators of liquidity in the context of types of liabilities. As for the asset coverage ratios, they can be supplemented and changed in accordance with the objects of research. Equally important are capital investment coverage ratios, which are vital to the e-tourism business. All of these indicators should be calculated taking into account the quadrant of interests, that is, in relation to the type of cash flow that is most effective for stakeholders at different stages of the life cycle of a tourism enterprise.

As a result, the proposed methodological approach to assessing the impact of internal factors on E-business cash flows makes it possible to obtain information on how fully the company uses its potential and understand what part of the funds the entrepreneur loses from the fact that the site has certain technical problems. It has been proved that the technical condition of the main intangible asset - an electronic store, can influence the formation of cash flow, since the received, brought or purchased site visitors do not necessarily become 150 buyers. A number of characteristics for the formation of the model have been established.

In the future, for example, attention should be paid to the development and implementation of machine learning algorithms and artificial intelligence for more accurate forecasting of demand, optimization of pricing and personalization of offers for customers.

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