Accounting Model of Write-Off of Costs in the Marketing Concept of the Life Cycle of a Tourist Product

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Abstract

The article is devoted to the development of a theoretical accounting model of write-off of costs consistent with the marketing concept of the life cycle of a tourist product at the stages of implementation (product launch), growth and development, maturity and saturation, decline (decline). The study presents a mathematical description of the model in terms of determining the amount of costs accumulated and written off at specific stages of the life cycle of tourism products and outlines a variant of its practical application. The influence of the peculiarities of the activity connected with the provision of tourist services, as well as the specifics of the tourist product on the marketing management and methodology of accounting of the tourist business enterprises in the aspect of the following characteristics of the tourist product is separately studied; inconsistency of quality; unsustainability; seasonality; inseparability of the source and object of tourist service; significant staticity; discrepancy in time of the fact of sale of tourist service and its consumption; territorial separation of consumer and producer in the market of tourist services. A number of direct and feedback links have been established between the accounting system and the system of commodity production and circulation in the management of tourist products. Prospects for future research on establishing the optimal value of the cost allocation coefficient at the third stage of the life cycle of tourism products in the proposed accounting model of write-off costs are outlined.

Keywords: ProductLifeCycle (PLC), TourismAreaLifeCycle (TALC), tourist product, accounting, life cycle costs of the tourist product.

JEL Codes: L83, M11, M41.

Introduction

Under the influence of technical progress and the development of competition, the volume and duration of production of goods (services) change over time cyclically. The period of time between the beginning of

development of the goods (services) and their removal from production and sale has the name of a life cycle of the goods (services). Along with finance and logistics, it is the most important functional area of enterprise management and a means of ensuring its sustainable development, including through supply chain management.

Life cycle management of goods (services) is an important component of the overall management of enterprises of various industries and forms of ownership. Tourist enterprises are no exception, the main purpose of which is to meet the needs of consumers in such a specific form of intangible goods as tourism products.

The concept of the life cycle provides for constant monitoring of the development of the tourism market, the introduction of an innovative tourism product and the timely rejection of one that loses its appeal. The results obtained through marketing research should serve as a basis for the overall strategy of the tour operator in the market. Diversification in this case is carried out by creating tourism products that are at different stages of the life cycle (Danilchuk, 2007).

The development of scientific thought allows to expand the range of problems in the system of marketing management of tourist products and to talk not only about the suitability of information and analytical accounting functions to meet the needs of marketing product policy, but also about the applicability of the concept of product life cycle in accounting theory and practice.

The impact of the peculiarities of activities related to the provision of tourist services, as well as the specifics of the tourist product on the methodology of accounting for tourism enterprises is as follows:

- insensitivity. Unlike tangible goods, a tourist service cannot be tasted, seen or heard until it is provided directly. Impact: the impossibility of using inventory accounts to account for the tourist product, the cost of material, labor and other resources is deducted directly from costs;

- inconsistency of quality. The quality of tourist services depends on who provides them and under what conditions. Because such services are provided and received at the same time, travel companies are limited in their ability to

control their quality. Impact: All customer complaints that entail financial and accounting consequences are forwarded to the entity of the tourism industry that actually provided services: claims for delayed departure – the airline, poor room service – the hotel company, transfer from the airport to the hotel and from the hotel – collection agency, etc. As a result, a complex chain of settlements is formed (sometimes with the participation of 4-5 contractors, eg, travel agency, tour operator, host party, insurance company, bailiffs), which requires proper reflection in accounting. Quality costs are considered in a narrower economic sense (often only in terms of providing appropriate information and consulting support), due to the inability to guarantee the quality of the final tourist product provided to the consumer. Sycheva (2011) even distinguishes two functions that determine the actions of the tour operator in the generalization of the tourist product: cumulative (design of a set of information resource about the destination, which is needed to service the production of tourist product) and broadcast (providing owners in the tourist center, in the volume of the expected needs of tourists in a particular tour);

- unsustainability. Tourist services cannot be stored. Impact: the impossibility of conducting an inventory in the classical sense of the process, ie comparing the actual balances with accounting data by checking the availability of property in kind through weighing, measuring, describing, and warehousing. It is irrelevant for tourist enterprises to keep records of shortages and losses from spoilage of a tourist product and, as a consequence, to introduce the practice of liability for its preservation;

- seasonality. Sales volumes increase significantly at the peak of the season and decrease in the off-season. Impact: For many tourism businesses, this results in the need to minimize costs during the low season. This is often achieved by maintaining a balance between permanent and temporary (seasonal) workers. The latter, working on the terms of civil law contracts, have an impact on the organization of accounting at the enterprise, taking into account the peculiarities of analytical accounting and taxation of their remuneration;

- inseparability of the source and object of tourist service. In

many cases, the provision of a tourist service requires the personal presence of the person providing it and the person to whom it is provided. Impact: final recognition of income from the sale of a tourist product is possible only after the return of the client from the trip, namelyafter the completion of services in full;

- significant staticity. The tourist service cannot be moved to another location. Impact: in this regard, in the structure of costs for the production of tourist products a large part are transport costs;

- discrepancy in time of the fact of sale of tourist service and its consumption. The purchase of a tourist product is carried out for a certain time (sometimes – several months) before the start of their consumption. Impact: in most cases, payments between the service provider and the tourist are made on full prepayment or by installments. The income arises later, which leads to the accumulation of a significant amount of future expenses in the relevant accounting account;

- territorial separation of consumer and producer in the market of tourist services. Impact: the sale of a tourist product takes place through retail chains (through agencies, regional offices, franchise network, etc.). Recently, direct sales via the Internet are developing. All this affects the reflection in the accounting of settlement transactions within these chains, the use of the latest means of cash settlements and information technology;

- the buyer overcomes the distance that separates him from the product and the place of its consumption, and not vice versa. Impact: in the accounting practice of tourist enterprises there is no concept of costs for delivery of products both on their own and by a third party.

In each case, the duration of the life cycle of tourism products is a key parameter of the evolutionary development of a tourism company, while the costs incurred during its course – an important object of accounting and management challenges, which determines the relevance of the study:

RQ: Development of a theoretical accounting model for the write-off of costs during the life cycle of a tourism product.

Literature Review

The most popular in the field of tourism economics are two models based on the marketing concept of the life cycle: Product Life Cycle (for a tourist product) and Tourism Area Life Cycle (for a tourist destination).

The first model is usually adapted for use at the level of tourism product types (Walle, 1994; Pigareva, 2017), individual tourism firms (Sanjocka, 2010) or industries (Sund, 2004; Kalygina and Efremov, 2019). At the same time, attempts are being made to put the Product Life Cycle concept into practice for countries or individual tourist regions: Algarve, Portugal (Da Conceicao Gonsalves and Roque Aguas, 1997), Russia (Zadneprenko, 2014); Yunnan, China (Zhang, 2016), Zaporizhzhia Region, Ukraine (Yukhnovskaya, 2019).

Butler (1980) developed a hypothetical model of evolution for use in regional tourism, based on the marketing concept of the Product Life Cycle (PLC) proposed by Levitt (1965). For the past 40 years, the proposed Butler model, called the Tourism Area Life Cycle (TALC), has been dominant for scholars seeking to explain the patterns of development of a tourist region or destination. In Berry (2001) and later Lagiewski (2006), as well as Uysal et al. (2012) summarized a study on the practical implementation of Butler's model in different regions of the world in the period from 1981 to 2009. In the last 15 years, the TALC model has not lost its popularity and has been used with varying degrees of success for: Madeira Island, Portugal (Alvares and Lourenco, 2005); Singapore and Vietnam (Bojanic, 2005); Zhangjiajie National Forest Park, China (Zhong et al., 2007); Caribbean Countries (Bolaky, 2008); Niagara Region, Canada (Brooker and Burgess, 2008); Tenerife Island, Spain (Oreja-Rodriguez et al., 2008); Kerala State, India (Asan, 2009); Goa, India (Kamat, 2010); Macau, China (Meng et al, 2011); Poznan, Poland (Zmyslony, 2011); Langkawi Island, Malaysia (Hazmi et al., 2012); Lake Toba, Indonesia (Lumbanraja, 2012); Macedonia (Petrevska and Collins-Kreiner, 2017); Antarctic Region (Kruczek et al., 2018); Saly, Senegal (LY, 2018); Island of Bornholm, Denmark (Szromek, 2019) and other tourist regions.

At the same time, the issues related to the accounting support of the cost management process at each stage of the life cycle of a tourism product still remain poorly understood.

Methodology

The tourist product goes through a number of stages in its own development, which are characterized by fluctuations in sales and profits. Each of these stages (implementation, growth and development, maturity and saturation, decline) from an accounting point of view is characterized by imbalance and time dissonance between income and expenses incurred to obtain them (eg, a significant part of the costs incurred during the development phase new tourism product, will be compensated only at the stage of maturity and saturation). This, in turn, requires the modernization of existing approaches to write-offs (table 1).

Table 1: Theoretical model of writing off costs in accordance with the marketing concept of the life cycle of the tourism product

Stage	Characteristic	Behavior of income and expenses	Write-off of expenses (offer)
Introduction (product launch) – Stage 1	Lack of profit, insignificant sales, a large share of marketing costs	Accumulation of a significant amount of costs against the background of lack of income	Accumulated costs will be written off in future periods
Growth and development – Stage 2	Expansion of the sales market, further improvement of the tourist product, reduction of advertising costs and reorientation of marketing efforts, the emergence of profits along with the still significant amount of costs	Decrease in the amount of indirect costs, revenues begin to grow. Profits appear at the end of the stage	Expenses are written off within the limits of the received incomes, surplus – accumulate
Maturity and saturation – Stage 3	Stabilization of sales, some reduction in profits (although its value may remain quite high), maintaining market share by modifying the product, intensifying competition	The amount of income exceeds the costs, which, however, is hampered by a significant amount of accumulated costs of previous periods	The costs accumulated in the previous two stages, as well as the costs of this stage are written off
Decline (decline) – Stage 4	Reduction of sales and, as a consequence, the amount of income, the emergence of new products from competitors	The cost continues to decline, but revenues at this stage are insignificant	All expenses incurred are deducted from the expenses of the period

Source: Vysochan (2014)

Mathematically, the amount of costs incurred by the travel company during a particular stage of the product life cycle (C_s) is equal to the sum of costs that will be written off at this stage and the amount of costs that will accumulate at the same stage (1):

$$C_s^w + C_s^a = C_s \qquad\qquad (1)$$

where, s – stage of the life cycle of tourist products, $s \in [1,2,3,4]$

C_s^w – costs written off during step s;

$C_s^a -$ costs accumulated during the stage s.

To determine the amount written off at a particular stage of the life cycle of tourism products, you can use the system of equations (2):

$$C_s^w = \begin{cases} 0, s = 1 \\ (\sum_{t=1}^{m_s} C_{s_t}^p), C_{s_t}^p \leq I_{s_t}^p, s = 2 \\ (\sum_{t=1}^{m_s} C_{s_t}^p + \sum_{t=1}^{m_s} C_{s_t}^d), s = 3 \\ (\sum_{t=1}^{m_s} C_{s_t}^p), s = 4 \end{cases} \quad (2)$$

where, m_s- duration of the *s-th* stage of the life cycle of tourist products, respectively, months, ; $s \in [1,2,3,4]$;

t – the period of time from the beginning of a specific stage of the life cycle of tourist products, months, $t \in [1, \dots, m_s]$;

$C_{s_t}^p -$ costs of period t, recognized at a particular stage of the life cycle of tourism products *s;*

$I_{s_t}^p -$ income of period t, recognized at a particular stage of the life cycle of tourism products*s*;

$C_{s_t}^d -$ costs accumulated in previous periods of the stages of the life cycle of tourism products s, which are allocated for write-off at the 3rd stage.

Accordingly, the determination of the amount of costs accumulated at a particular stage of the life cycle of tourism products is as follows (3):

$$C_s^a = \begin{cases} (\sum_{t=1}^{m_s} C_{s_t}^p), s = 1 \\ (\sum_{t=1}^{m_s} C_{s_t}^p - \sum_{t=1}^{m_s} I_{s_t}^p), C_{s_t}^p > I_{s_t}^p, s = 2 \\ 0, s = 3 \\ 0, s = 4 \end{cases} \quad (3)$$

Most discussions arise about the adequate calculation of the value of the indicator of distributed costs (C_(s_t)^d). To do this, you can use one of the proposed methods:

- rectilinear – costs are written off in equal parts during the third stage, based on the estimated duration of the latter. The method is as simple and clear as possible, does not require additional calculations and special knowledge in the field of mathematics;

- reduction to income – the amount of expenses written off during the reporting period depends on the share of income received in this period from the total amount of income planned to receive at the third stage of the life cycle of the product. Since the planned amount of income is constantly adjusted based on actual indicators, the value of written-off accumulated costs must also be adjusted, which complicates the calculation. However, this method is in line with the principle of accrual and matching of income and expenses, assuming that the flow of costs is concomitant with the flow of income associated with them;

- reduction to direct costs – the amount of costs written off during the reporting period depends on the share of unallocated direct costs received in this period from the total amount of direct costs to be made at the third stage of the product life cycle. This method, like the previous one, requires constant adjustment of the planned costs in order to bring them to actual.

Adjustment mechanisms have already been used effectively and have yielded good results in the allocation of other types of cumulative costs (Osidach, 2009), significantly improving the accuracy of the reported information.

Results

Modern research in the field of life cycle of goods (services) allows us to establish a number of direct and feedback links between the accounting system and the system of commodity production and circulation:

- the lifespan of any product or service is limited. It can be several years or several decades, but there is always a time when one product is pushed out of the market by another, newer one. Accounting is more tied to certain reporting periods (month, quarter, year), which usually do not coincide with the product life cycle. As a result, in our opinion, we should talk not only about the accounting of activities, based on the premise of the continuity of the latter, but also about the accounting (or at least its management component) of the product, based on the limited life. In the first case, the reporting period will be formed on the basis of calendar time intervals, in the second – on the basis of the stages of the life cycle of the product (service). This approach is already used in strategic accounting, where the calculation of costs for the entire life cycle of the product is one of its effective methods;

- individual stages of the life cycle of goods (services) are determined on the basis of indicators of sales revenue and profit of the manufacturer or seller. At the same time it is necessary to emphasize the differences between the indicator of accounting profit, which is formed in accordance with the principles of historical (actual) cost, and accrual and compliance of income and expenses from economic profit, which takes into account opportunity costs and is designed to establish the efficiency of

- the same product (service) when sold in different markets in the same period of time may be at different stages of the life cycle. This fact must be taken into account when constructing analytical accounting, which should be conducted not only with regard to groups of goods (services), but also markets, as well as when forming geographical sales segments for the needs of segment reporting;

- the life cycle of goods (services) does not always end with the withdrawal from the market. It should always be borne in mind that at the last stage of the life cycle and after its completion, the company may continue to bear the costs associated with it: warranty repairs, loan repayments, lawsuits, etc .;

- there are reasons why any product (service) can be withdrawn from production at any stage of the life cycle. The method of accounting and writing off costs should take into account this possibility as much as possible, in particular through the adjustment mechanism;

- some goods (services) may be able to extend the life at any stage, in particular through certain marketing activities. In this case, a new level of product life cycle is created, to which the translational symmetry of the accounting technique should be applied, taking into account the operations reflected in the previous stages of life;

- the transition from stage to stage is usually smooth, without sharp fluctuations. This suggests that the risk of using in the accounting, focused on the life cycle of the product (service) valuation methods that underestimate costs and overestimate the income of the enterprise is minimal;

- for each stage of the product life cycle is characterized by specific goals and objectives, as well as special approaches to the formation of strategies for marketing, finance and production. Accounting should be as flexible as possible, producing information that meets user needs on the principle of maximizing usefulness and relevance.

Extending the current concept of the life cycle of a tourism product to address the practical challenges facing accountants in recognizing and allocating costs associated with the development, creation and implementation of a tourism product throughout its existence can be illustrated in table 2.

Table 2: Conditional example of the implementation of the proposed method of writing off costs, consistent with the marketing concept of the life cycle of the tourism product

Life cycle stage	Period, month	Recognized income for the period, USD	Recognized expenses of the period, USD	"Classical" methodology	Proposed methodology		
				Depreciated expenses of the period, USD	Accumulated expenses of the period, USD	Depreciated expenses of the period, USD	Total accumulated costs, USD
1	2	3	4	5	6	7	8
1	1	0	7000	7000	7000	0	7000
	2	0	8000	8000	8000	0	15000
2	3	500	10000	10000	9500	500	24500
	4	500	10000	10000	9500	500	34000
	5	1000	8000	8000	7000	1000	41000
	6	1000	8000	8000	7000	1000	48000
	7	1500	6000	6000	4500	1500	52500

Life cycle stage	Period, month	Recognized income for the period, USD	Recognized expenses of the period, USD	"Classical" methodology	Proposed methodology		
				Depreciated expenses of the period, USD	Accumulated expenses of the period, USD	Depreciated expenses of the period, USD	Total accumulated costs, USD
1	2	3	4	5	6	7	8
3	8	2000	5000	5000	0	10250	47250
	9	2500	5000	5000	0	10250	42000
	10	3500	4500	4500	0	9750	36750
	11	4500	5500	5500	0	10750	31500
	12	6000	6000	6000	0	11250	26250
	13	10000	8000	8000	0	13250	21000
	14	13000	9000	9000	0	14250	15750
	15	16000	9000	9000	0	14250	10500
	16	17000	9500	9500	0	14750	5250
	17	17000	12000	12000	0	17250	0
4	18	14000	12000	12000	0	12000	0
	19	10000	11000	11000	0	11000	0
	20	5000	7500	7500	0	7500	0
	21	2500	5000	5000	0	5000	0
	22	1000	5000	5000	0	5000	0
Pearson correlation coefficient (relationship between recognized income and written off expenses)		0.58712294			0.85985362		

Note: The "classical" method involves writing off costs in the period of their recognition in full. The indicator of distributed costs is calculated using the straight-line method

Source: author's implementation

In the proposed method, the calculation of individual indicators is as follows:

- "Accumulated expenses of the period" (column 6 of table 2) – the share of expenses of the reporting period, which relate to the total accumulated expenses and will be written off in the following reporting periods. For the 1st and 2nd stages of the life cycle of the tourist product are defined as the difference between the recognized expenses of the period (column 4 of table 2) and the recognized income of the period (column 3 of table 2). For the 3rd and 4th stages of the life cycle of the tourist product there is no accumulation of costs;

- "Write-off costs of the period" (column 7 of table 2) – costs of the reporting period, which are written off on the financial result of the tourist enterprise within the received income (stages 1 and 2 of the product life cycle), recognized costs with added costs (stage 3 of life) product cycle) or only recognized costs (stage 4 of the product life cycle);

- "Total accumulated expenses" (column 8 of table 2) – expenses that belong to the distribution and are defined as the difference between the total balance of unallocated expenses for the previous period and the accumulated expenses of the reporting period and distributed expenses in the current reporting period. At the 4th stage of the life cycle of the tourism product, the distribution of costs does not take place, while during the 1st and 2nd stages only the accumulation of costs that are written off during the 3rd stage takes place.

Pearson's correlation coefficient establishes the relationship between recognized income and written-off

expenses at the stages of the life cycle of the tourism product for the "classic"and proposed models and serves to confirm compliance with the principle of accrual and matching income and expenses in accounting.

Conclusions

Note that the model presented in the article can be useful both in marketing (the ability to assess the ratio of income and expenses at each stage of the life cycle of the tourism product) and in accounting (compliance with the principle of matching income and expenses) dimensions. The analysis of the linear relationship between the indicators of recognized income and written-off expenses of the period in the hypothetical model showed a significant increase in the Pearson coefficient from 0.587 (for the "classical" method) to 0.860 (for the proposed method), indicating an increase in the positive correlation between income and expenses. with the development and implementation of a tourist product.

In the accounting plan, the costs of the reporting period related to income received in subsequent periods (all costs of the first stage and part of the costs of the second stage) should be accumulated in a separate account "Deferred expenses" (on sub-accounts "Expenses accumulated at the stage development and implementation of a tourism product","Expenditures in excess of the amount of income received at the stage of growth and development of the tourism product") and write off at the stage of maturity and saturation of the life cycle of the tourism product.

Prospects for future research in the issues raised in the study, we believe can be:

1) search for the optimal method of establishing the cost distribution coefficient at the third stage of the life cycle of tourist products;

2) checking the effectiveness of the proposed hypothetical model when changing indicators: replacement of the duration of each stage of the life cycle of tourism products; unprofitability / profitability of a particular tourist product as a ratio between resources expended and income received in general; various combinations of income and recognized expenses for each stage of the product life cycle.

The practical use of the model of write-off of costs in accordance with the marketing concept of the life cycle of the tourist product makes it possible to adhere to the principle of accrual and compliance of income and expenses, ensure accuracy and relevance of reporting information, coordinate efforts of managers, marketers and accountants (Vysochan, 2015).

Limitations in the use of the presented model are related, on the one hand, to simplicity, lack of accuracy, limited scope (Petrevska and Collins-Kreiner, 2017), ignoring the impact of the environment (Ho and McKercher, 2016), or so-called "isolation". , which are inherent in the TALC and PLC models, as well as the legislative regulation of the accounting procedure for the allocation of costs associated with the preparation and development of a new tourism product that can be used in a particular country.

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