

Modeling the strategic management process in ADONIS:CE considering global digital trends

Kokodey T.A.
Sevastopol State University
Sevastopol, Russia
tanya.kokodey@gmail.com

Kolesnikov A.M.
Saint-Petersburg State University of Aerospace Instrumentation
St.Petersburg, Russia
9843039@mail.ru

Lomachenko T.I.
Sevastopol branch of the Plekhanov Russian Economic University
Sevastopol, Russia
lomachenko37@yandex.ru

Abstract — In this study, the optimal format of strategic management of an enterprise was formalized based on a developed methodological approach to the formation of an optimal multicomponent strategy (which is a set of individual strategies) under conditions of a polycyclic environment considering global digital trends. Namely, a model of the business process of strategic management of a company was built and simulations of this process were carried out in the Adonis: CE software environment. The first simulation used traditional working environment, in the second simulation only digital workplaces were included. As a result, we observed the decrease not only in personnel costs, but also in the cost of implementing the set of tasks of the proposed business process.

Keywords — strategic management, business process, modeling, simulation, digital trends, Adonis CE software.

I. INTRODUCTION

In the second half of the 20th century, breakthrough information and communication technologies began to evidence themselves. Digital technologies are present today in virtually every aspect of our lives, including the economy. The digital economy if worth three trillion dollars today, which is about the GDP of the United Kingdom. This entire economic value has been generated in just the past twenty years since the launch of the Internet. It is an accept fact that this growth of the digital economy has had widespread impact on the world economy as a whole. Consumer behaviors and expectations have been dramatically altered. Instantaneous communication has led to consumer expectations of instantaneous satisfaction of needs, wants, and desires. This radical change in people’s lives causes the need for companies to proactively seek adjustments to their strategies in order to maintain competitiveness in the modern contemporary digital economy. Recently, the new wave of transformation for business models caused by appearance of the new generation digital technologies such as internet of things, augmented reality, virtual reality, machine learning and artificial intellect, robotics, and 3D printing, if introduced together, can lead to significant increases in productivity, improved output and product enhancements at various companies. Businesses that are reliant on digital computing technologies have come to be known as operating in the “digital economy”. This has come to be known by various other names such as the “Web Economy”, the “New Economy” or the Internet Economy”. A clear delineation between the digital economy and the traditional economy no longer exists. If companies take these newer digital technologies into account in strategy development, it can contribute to their international competitiveness. Therefore, radical changes can be expected in connection with the likelihood of continuous improvements in these still emerging technologies. Moreover, the constantly increasing complexity of the dynamic and uncertain polycyclic environment and the expected potential for its future changes explain the need for a complex and effective adaptation in all industries, the instrument of which is the strategy seen as a long-term optimal response to these changes [1, 2, 3, 4, 5].

II. RESEARCH METHODOLOGY

A significant contribution to the development of a wide range of theoretical issues of strategic management was made by the works of D. Hassi, A. Thompson, G. I. Ansoff [6], D. Steiner [7], R. Kaplan and D. Norton [8] and others. The works of these authors are focused on the development and improvement of the strategy concept, as well as the variants of the strategic tools of the enterprise (models, methods and techniques of development and implementation of strategies) in particular, the classical models of strategic analysis and planning (BCG, GE/McKinsey, ADL/LC, Shell), the model of implementation of the strategy Balanced Scorecard, etc. The main modern software products for describing business processes include ADONIS, Tibco Business Studio, ERwin Process Modeler (BPwin), Sybase PowerDesigner, ELMA, GPSS, IBM WebSphere Business Modeler, etc.

The business modeling environment ADONIS, produced by the Austrian company BOC Group, also includes
components of analysis and simulation of business processes, so it was chosen as a combined tool in this article.

While appreciating the scientific and practical significance of the creative search for foreign and domestic scientists, it is necessary to note that the existing research covers only isolated aspects of the formation and implementation of the strategy and does not contain the development of a comprehensive toolkit for formalizing the process of formation of the optimal strategy of any industry under conditions of polycyclic environmental variability.

**III. RESEARCH RESULTS**

The purpose of the article is model the optimal format of strategic management for a company. Let's consider the structure of the continuous process of strategic management and build its model in the system of business modeling Adonis: CE. As it is shown in figure 1, the initial stage of considered business process is presented by three parallel actions (tasks):  

1. Assessment of the effectiveness of strategic alternatives implemented in previous strategic periods;  
2. Determination of the current profile of the enterprise;  
3. Assessment of the current format of strategic management in terms of the degree of its formalization, specifics, instrumental base and efficiency.

Assessment of the effectiveness of the implemented strategies (1) can be carried out using several indicators, for example, the percentage of failed attempts to implement the strategy, in per centage. In turn, one of the efficiency indicators of the current strategic format may be the increase of the strategic position of the enterprise.

In particular, the parameters of implementation of the methodological approach to the formation of an optimal multi-component strategy proposed in this study are determined (figure 2).

As part of this study, a methodological block diagram (Figure 2) was drawn up for the formation of an optimal multi-component strategy (as a set of private strategies) for a enterprise under conditions of a polycyclic environment, i.e. based on the assumption of nested, correlated and independent cycles and non-cyclical trends in its overall dynamics. Such approach assumes preliminary formalization and forecasting of the enterprise environment influences, further development of private optimal on consumer strategies by methods of ”fine-tuning” and ”managing” the consumer, as well as development of ”time series” of optimal multi-component strategies considering the possibilities and limitations of the enterprise environment. At the same time, ”fine-tuning” to the existing patterns (templates) of consumer behavior is carried out through the most complete satisfaction and strengthening of existing motives of product consumption.

"Customer management" is a modeling of desired behavior - new patterns or their specific implementations - by creating new motivational categories or private motives or using established business associations to increase the competitive advantage of the enterprise. After that, the search for various combinations of obtained private strategies is carried out, each of which is considered as an optimal multi-component strategy for the consumer or a strategic set of enterprises.

In each strategic period, alternatives to these multi-component strategies are evaluated from the point of view of achievable strategic positions, considering the possibilities and limitations of implementation on the part of the environment, and then one optimal multi-component strategy is selected.

As a result, a sequence of multi-component strategies
selected in this way is formed in time.

Within the framework of the business process model (figure 1) we consider different variants of parameters of introduction of the methodological approach depending on an enterprise profile which defines applicability and efficiency of separate methods and stages of the offered approach. For example, the reasonability of the stage (D) of formation of the "time series" of optimal multi-component strategies is justified for the enterprise of the profile "Highly diversified multi-structural producer", but it is not justified for the enterprise of the profile "Small enterprise producer".

Based on the results of the above steps of the business process (Figure 1), the required overall strategy budget and the need for human resources for strategy development and implementation are estimated.

The next two blocks of formalization and forecasting of the environment, as well as the development and coordination of strategies correspond to the methodological approach to the formation of an optimal multi-component strategy proposed in this study. The obtained time series of optimal multi-component strategies is coordinated with the top management of the enterprise and is confirmed. After that, the personnel of the enterprise are informed about the strategic plan and necessary training of the employees involved in its implementation.

The next aggregated stage of the business process "Strategy implementation and control" implies a set of interacting processes:

- planning and implementation of strategic initiatives (projects) involving several levels of management and departments of the enterprise;
- coordination of interaction between structural subdivisions of the organization and delegation of authority for the implementation of strategies;
- testing of strategies through several strategic pilot projects;
- monitoring of the implementation, adjustment and adaptation of strategies depending on the variability of the environment, etc.

For the above-mentioned business process, we will develop a graphic model of the working environment (Figure 2), acceptable for a highly diversified multi-structural manufacturer. At the basis of this model we will form a strategic planning department headed by a strategic development manager (Employee 0), with the staff: two specialists of the department and two marketers of the environment analysis and forecasting group.

![Diagram](image_url)
This model also includes heads of other departments, in particular, the CFO and heads of HR and IT departments.

IV. RESULTS DISCUSSION

We will discuss the simulation results for two alternative options to run the developed business process (figure 1) at a company. The first one is traditional and the second is alternative that uses digital workplaces.

In Adonis CE, following the traditional approach, for each employee we set the corresponding tariff rates, work schedule and functional duties, and then create links between the work environment model and the business process model (Figures 1 and 2). For each task of the business process (figure 1), in addition to the cost and time spent on their implementation, we will determine the appropriate employees. Individual cost parameters of the business process tasks (figure 1) were estimated based on the analysis of the annual financial statements of the American candy manufacturer - the Ferrara Candy Company, based in Oakbrook Terrace, Illinois, and owned by the Ferrero Group. This company, found in 2012, as a result of a merger of the Illinois-based Ferrara Pan Candy Company and Minnesota-based Farley's & Sathers Candy Company. The product line of the Ferrara Candy includes such brands of Ferrara-branded pan candy as Atomic Fireballs, Red Hots, Lemonheads, and Original Boston Baked Beans as well as those of Farley’s & Sathers: Chuckles, Brach’s, Jujyfruits, and Now and Later. The Ferrero Group declared acquisition of the company in November 2017, finalizing the deal in December 2017. Later in 2019 Ferrara announced it was moving its world headquarters to Chicago, Illinois.

In 2018, the company's net profit amounted to 161,400,000 USD and sales revenue of 3,002,576,000 USD [9,10].

Simulation results for the business process shown in figure 1 are described below. The estimate of cost and time for the task of assessing the current strategic management format is 500 USD and two days correspondingly, being the function of the manager at the strategic management department (figure 2). The total duration of the strategic management business process (cycle time) is 1 year and 68 days. The duration of the subprocess for the calibration of consumer behavior is 30 working days. The total cost of the above process and subprocess (excluding personnel costs) is 10,134,696.00 USD and 21,078.00 USD, accordingly.

Following the traditional approach, we evaluated the personnel costs and total costs of one run of the strategic management process, shown in figure 1, by means of its simulation in Adonis:CE using the algorithm of capacity analysis. The results of the process simulation show the total cost of personnel per one year and 68 days equal to 76,903.68 USD, and the cost of implementing the set of tasks is 10,134,696 USD, which amounts to 6.33% of the company's net profit in 2018.

Before introducing the alternative way to run the business process shown in figure 1, we need to clarify the notion of a digital workplace, as far as it is used during the simulation.

Digital workplace assumes change in the mindset of a company, that is, realization of the fact that the way people work today differs from that five years ago, when the term “digital workplace” was introduced. This difference is driven by the evolution of digital technologies. Currently Google search for the term “digital workplace” provides over six million results. Although, a consistent definition of this notion is hard to find. As the popularity of the term “digital workplace” has increased, so too have the interpretations. Not since the emergence of Big Data, have so many experts realized the need to weigh in with their explanation.

Part of the reason it has been so challenging to clarify a definition is because the line between the physical office and the place where work actually happens is becoming more vague. Definitions also vary because the digital workplace means different things to different people. Since the concept changes according to industry and individual, scientists in their researches couldn’t progress beyond an abstract or theoretical definition. Each variant is inherently ambiguous.

Up until recently the term workplace referred to a physical space where employees gathered to complete their work assignments. Now the term is more conceptual. A workplace is now an always-connected environment that provides instant access to everything employees need to complete their job.

Back in 2009, Paul Miller, CEO and founder of Digital Workplace Group (DWG), included this term in people’s lexicon. It was conceived as an understanding that an exploration into how technology would affect both the workplace and the nature of work would be necessary. Several years later, Paul Miller authored the book: The Digital Workplace: How technology is liberating work. Miller’s angle focused on the evolution of the workplace and how work happens. Miller cited three defining elements of all digital workplaces: digital presence, governance, and speed and efficiency.

Later in 2012 Deloitte also got involved into this discussion proclaiming, “The digital workplace encompasses all the technologies people use to get work done in today’s workplace—both the ones in operation and the ones yet to be implemented. It ranges from your HR applications and core business applications to e-mail, instant messaging and enterprise social media tools and virtual meeting tools.”

By 2014 industry analyst Gartner also entered the discussion with their own definition. They defined it as “An ongoing, deliberate approach to delivering a more consumer-like computing environment that is better able to facilitate innovative and flexible working practices.”

In this research, by comparing two simulations (with and without digital workplaces) of the developed business process of strategic management, we indicate that in the alternative approach, we evaluated the total cost of personnel per one year and 68 days equal to 70,000.00 USD. This shows the decrease of 6,903.68 USD in the comparison with the traditional approach. In the same time the cost of implementing the set of tasks is 10,000,000.00 USD that shows 134,696.00 USD decrease in the comparison with the traditional approach.

V. CONCLUSION

In this study, the optimal format of strategic management
of an enterprise was formalized based on a developed methodological approach to the formation of an optimal multicomponent strategy (which is a set of individual strategies) under conditions of a polycyclic environment considering global digital trends. Namely, a model of the business process of strategic management of a company was built and simulations of this process were carried out in the Adonis: CE software environment. The first simulation used traditional working environment, in the second simulation only digital workplaces were included. As a result, we observed the decrease not only in personnel costs, but also in the cost of implementing the set of tasks of the proposed business process. Thus, creating an effective digital workplace, although challenging for many companies, increases overall productivity and competitiveness in the digital world.

References

[1] Snooks G.D. The dynamic society. Exploring the sources of global change / G.D. Snooks. – London and N.Y.: Routledge, 1996. – 491 p.
[2] Toffler A. The Third Wave / A. Toffler. – New York: William Morrow and Co. Inc, 1980. – 517 p.
[3] Frank A. G. Reflections on the world economic crisis / A. G. Frank. – New York: Monthly Review Press, 1981
[4] Carpenter, Stephen [et al.] (2005), Ecosystems and human well-being : scenarios : findings of the Scenarios WorWashington, DC: Island Press.
[5] Kokodey, T.A. Analysis and formalization of strategies of "Rainford" trade & industry group by method of reverse identification (1992-1996) // Actual Problems of Economics. – 2012. – № 7 (133)– C.26-32.
[6] Ansoff H. I. Strategic Management / H. I. Ansoff - N.Y.: John Wiley, 1979. – 272 p.
[7] Steiner G. A. Strategic Planning – What Every Manager Must Know: A Step-by-Step Guide / G. A. Steiner - N.Y.: The Free Press, 1979. – 383 p.
[8] Kaplan R. S. The Balanced Scorecard – Measures That Drive Performance / R. S Kaplan, D. P. Norton // Harvard business review,1992. – № 1. – P. 71-72.
[9] Stern C. W. Perspectives on strategy: from the Boston Consulting Group / Stern C. W. – MA.: John Wiley and Sons, 1998. – 336 p.
[10] Freeman R. E. Strategic Management: A Stakeholder Approach / R. E. Freeman. – Boston: Pitman, 1984. – 989 p.