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IMPLIKACIJE I IZAZOVI KORŠĆENJA BUDŽETA ZASNOVANOG NA UZROČNICIMA U SAVREMENOM POSLOVNOM OKRUŽENJU

IMPLICATIONS AND CHALLENGES OF USING DRIVER-BASED BUDGETING IN CONTEMPORARY BUSINESS ENVIRONMENT

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Abstract

The main characteristics of the business conditions of today's companies are frequent and intensive changes. The dynamic business environment of modern companies requires a new way of management that involves an implementation of new management models, methods, techniques and instruments that are adapted to the modern environment and able to respond to challenges and solve problems that arise in new business conditions. The aim of the paper is to describe the specifics of driver-based budgeting, as one of new management instruments. In comparison with traditional budgeting, driver-based budgeting possesses multiple advantages for companies that enable responding to changes in business environment in a more agile way. These advantages, as well as some perceived difficulties with its implementation in companies are described in the paper. The results of the paper contribute to the further development of the theory and can be an incentive for future research, as well as basis for making recommendations and practical instructions that could help companies improve their budgeting system.

Sažetak

Glavna karakteristika uslova poslovanja današnjih preduzeća jesu česte i intenzivne promene. Dinamičan poslovni ambijent savremenih preduzeća zahteva nov način upravljanja koji podrazumeva primenu novih upravljačkih modela, metoda, tehnika i instrumenata koji su prilagođeni savremenom okruženju i koji mogu da odgovore na izazove i reše probleme koji se javljaju u novim uslovima privređivanja. Cilj rada je da opiše karakteristike budžetiranja zasnovanog na uzročnicima (engl. - Driver-based budgeting), kao jednog od novih menadžment instrumenata. U poređenju sa tradicionalnim budžetiranjem, budžetiranje zasnovano na uzročnicima ima višestruke prednosti za kompanije kojima omogućava agilniji odgovor na promene u poslovnom okruženju. U radu su opisane ove prednosti, kao i neke od uočenih poteškoća u vezi sa njegovom primenom u kompanijama. Rezultati istraživanja doprinose daljem razvoju teorije i mogu biti podstrek budućim istraživanjima, kao i osnova za koncipiranje preporuka i praktičnih uputstava koja bi mogla da pomognu kompanijama u unapređenju svog sistema budžetiranja preduzeća.

Keywords: *driver-based budgeting, planning, business drivers, forecasting, model, advantages, challenges*

Ključne reči: *budžetiranje na osnovu uzročnika, planiranje, uzročnici, prognoziranje, model, prednosti, izazovi*

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1. Introduction

Globalization and the rapid development of information and telecommunication technologies over the last decades have led to significant changes in the business environment of the companies. These changes required the adjustment of a large number of business segments and management instruments, including budgeting. Budgeting systems, which are still used in many companies, were developed many years ago, for the needs of doing business in the industrial era, which was relatively static. The post-industrial business environment is much more turbulent, so traditional budgeting systems, as "products" of the industrial era, had to adapt to the new business conditions. The main disadvantage of traditional budgets is reflected in the fact that they are no longer able to meet the needs of modern companies' management. In circumstances of high risk and uncertainty, constant technological changes, growing competition, increasing emphasis on intangible assets, etc., traditional budgeting has become an inefficient management tool. Therefore, it is not surprising that there are more and more frequent and loud calls for something to be done in order to substantially improve the process of financial planning and budgeting. Calls for action come from theorists, but also directly from chief executive officers, c*hief financial officer*s, business unit managers, etc. Also, it is not surprising that this initiative has priority over other competing finance and business initiatives [1]. Therefore, planning and budgeting for a new business environment is becoming a major topic for researchers and practitioners and is attracting much attention in professional circles in order to meet the requirements of today's highly competitive and dynamic business environment.

Changes in the business environment have led to a number of challenges facing the budgeting system and set as an imperative the necessity of creating new budgeting approaches, primarily due to easier and faster response to market changes, strengthening the competitiveness of the company and its more efficient business operations. Regarding that, the paper describes driver-based budgeting, one of the contemporary budgeting and planning tools developed to overcome the shortcomings of traditional budgeting. This budgeting approach is oriented towards making main budgeting activities, like collection of data, consolidation and reporting, more simplified and faster. Driver-based budgets are with high level of reliability, efficiency, flexibility, responsiveness to changes and strategic alignment [2], [3]. Taking into account the numerous benefits that its implementation brings, it is not surprising that there is a growing interest in this approach.

The paper is structured in three chapters. Theoretical background of driver-based budgeting is described in the first chapter. The second section emphasizes its benefits, while the third chapter determines challenges and barriers for the implementation of driver-based budgeting. At the end of the paper, concluding remarks are presented. The used research method in the paper is literature review, given that this method provides the possibility of setting the theoretical foundations based on the analysis of the research findings obtained by different authors. The methodological procedure included collecting articles related to this topic, published in international and domestic academic and professional journals, as well as books on the topic of driver-based budgeting. After reviewing the papers and selecting those that provide valuable information on the research subject, the next step of the methodological procedure included highlighting the key results obtained by the authors of the selected articles and their systematization in a way that allows the identification of key findings in the studied area, as well as practical instructions.

2. The concept of driver-based budgeting – main characteristics

Facing a dynamic business environment, market uncertainty, and a continuous pressure from top management to improve the planning, budgeting and forecasting process, a lot of planning professionals have started to incorporate driver-based budgeting into their companies' planning methodology. Driver-based budgeting represents a planning approach which has the goal to make the process of planning concentrated on those activities that drive business performance and to put focus on variables that are controllable. It has roots in the concept of modeling and it assumes linking activity drivers to financial outcomes [4]. This approach aims to put the factors which are critical to driving success in focus of business planning and to enable companies to run different scenarios on the basis on mathematical relationship between these drivers and final results and outcomes. According to Player et al. [5], driver-based budgeting employs "logic diagrams to represent causal and quantifiable relationships between underlying drivers and their effects on the overall business". This budgeting approach is essentially based on mathematical relationships between key operational drivers and financial outcomes [6]. Thanks to mathematical modelling, management is able to comprehend effects of these drivers on projected business results and financial performances.

In order to adequately implement driver based budgeting, it is necessary to determine, understand, evaluate and utilize drivers, which represent a basis of the model. In the process of driver-based planning and budgeting, a driver represents "a piece of non-financial or financial data which when changed directly impacts either revenues or expenses, ultimately changing the forecast profit and loss account, cash flow and balance sheet" [7]. In a driver-based Financial Planning and Analysis model, a driver is defined as any operational cause that produces a financial effect [8]. The value of each driver is defined based on historical data, market indicators and benchmarking.

Drivers can be external (exchange rates, oil price, *gross domestic product*, weather conditions, etc.) or internal (production capacity, headcount, travel costs, etc.). Differentiation between external **and internal** drivers is important due to the difference in a degree of controllability. In this regard, internal drivers are generally **more controllable than external ones.** There is no universal list of drivers applicable for all organizations and industries, therefore, a variety of them exists. Barrett [7] pointed out following types of drivers that are usually used: quantitative measures of demand, consumption rates, productivity rates or cycle times, unit resource costs, unit selling prices and other drivers used in modelling (Table 1).

Table 1. Types of drivers used in planning

Types of drivers	**What they measure**	**Examples**
Quantitative measures of demand	Forecasted level of demand sold to customers and demand faced by individual departments	Market size and market share The number of sales units of a product The number of inbound telephone calls The number of late payments to follow up The number of active customers The number of items per sales order The number of pieces of direct mail sent to prospects
Consumption rates, productivity rates or cycle times	The amount of resource required to satisfy demand or produce a unit of output	Simple productivity ratios (e.g. the number of calls per agent per day) Cycle times (e.g. the average duration of a call) The amount of space needed by each full-time equivalent The ratio of staff to supervisors
Unit resource costs	The average cost of a unit of resource during a period	The cost of a litre of fuel The average salary cost of a particular grade of staff The anticipated cost of replacing a desktop computer

Unit selling prices	The average selling price of a product or service	The average premium of a particular type of insurance policy The anticipated fee for each consulting engagement The anticipated selling price for a particular product
Other drivers used in modelling	Probabilities and percentages	The proportion of inbound telephone calls that result in a sale The anticipated rate of customer attrition The proportion of new sales orders that get invoiced during the current month

Source: Barrett (2007)

When designing driver-based model, planning professionals usually follow the Pareto Principle, also known as the 80/20 rule - focus on the 20% of the drivers that explain 80% of the numbers [9]. Each company has its own key indicators that can provide a snapshot of overall performances of a business. Key drivers are inputs, activities, factors, etc. that have the greatest impact on the operational and financial performances. Since driver-based budgeting implies preparing plans and budgets based on key drivers, identifying company's core business and value drivers is crucial for successful implementation of this management and planning approach.

The driver-based budgeting requires using of both, financial data from the general ledger and non-financial data to make projections, that is, it integrates the operational elements of the business. Integration of non-financial data is very important since line managers do not look at their financial costs on daily basis, but, instead, they typically focus on the most important non-financial indicators that actually drive revenues and costs [2]. As shown in Figure 1, when line managers prepare the budget for their departments, they commonly start with key non-financial indicators, modelling the demands and resource consumption rates to project resource requirements and costs. The integration of non-financial data into the budgeting process enables companies to implement predictive planning since managers at operational level, as well as financial managers, are able to model resource requirements, capacity constraints and costs, and to create a dynamic budget which is suitable for near real-time forecasting [2].

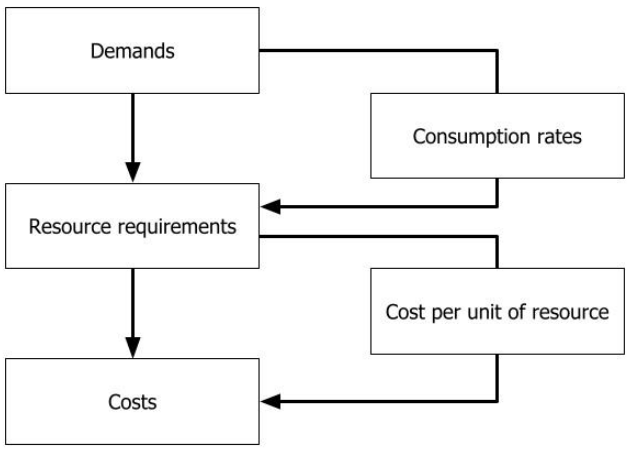

Figure 1. The model of Driver-based budgeting
Source: Barrett (2005)

Changing of conditions in one segment of business usually causes changes in performances of other segments in the organization so it is crucial to reveal the impact of these changes on every department as quick as possible, and to accurately predict the influence on overall business performances. Many drivers are presented in the form of metrics (for example, the number of new orders or average selling prices) which are most often being reported on a regular short time

(daily, weekly or monthly) basis. This allows managers of cost centres/business units to easily review, update data and perform real time re-forecasting. As a result, there is an important improvement of the collaboration and alignment among cost centres and business units within the organization. Driver-based budgeting is very useful for strategic planning, where it is necessary to make projections of long-term trends for different business indicators. By enabling linking of operational plans to strategic objectives, it provides a genuine insight into resource requirements and their relation to strategic goals. This provides a clear benefit for financial planners, who can perform realistic simulations of the impact of different budget changes on every organizational unit and organization as a whole, before deciding on the final version of budget. Additionally, managers at the operational level can make plans by taking into consideration how their activities induce costs and revenues in other business units. The final result of well-performed driver-based budgeting should be completely aligned strategic, operational and financial plans of the organization.

Driver-based models are an essential foundational component for establishing a rolling forecast framework [6]. The adoption of driver-based planning, companies make performing rolling forecasting feasible, either completely, or partially, such as updating of monthly sales or reforecasting of annual results at the quarterly level. Rolling forecasting based on key operational drivers enables continuous insight into performances, so it provides valuable and timely estimations of expected performances in the future [10]. Driver-based planning allows companies to adopt more continuous and forward-looking forecasting that enables achievement of better alignment with business cycle. By using drivers for revenues and costs, companies are able to more accurately and timely perform forecasts which are based on more realistic predictors of future performances [11]. Also, updates can be quickly consolidated into group re-forecast, determining impact of changes on other departments within the organization, as well as on entire organization [2].

Driver-based budgeting is an important segment of integrated business planning, which implies horizontal and vertical integration of plans and a strong connection between planning, strategy, reporting, actions, measures, decisions, reward systems, IT tools, etc. This type of predictive planning demands centralized database which enables data collection and consolidation in a real-time and dynamic forecasting of actual as well as "what-if" scenarios [2]. Business intelligence approaches, methodologies and tools have to be employed in order to properly understand and evaluate drivers and relationships which are demanded for performing flexible and more accurate budgeting [12], [3].

Driver-based models are based on mathematical relationships that connect drivers and outcomes through a logic diagram. The greater is the number of relationships tracked in a logic diagram, better are the predictions [5]. Therefore, it is crucial to utilize the large quantity of data in an effective way, at the level of business units and entire organization, and to apply business intelligence tools to enable better understanding of essential business processes. Also, certain technological advances in the area of data warehousing and analysis enable faster collection and storage of various data from multiple sources (e.g. sales, production, accounting), easier access to those data, as well as application of different data mining techniques in order to identify and analyze most important drivers and cause-and-effect relationships. Various data mining and statistical techniques, such as factor analysis, multiple regression and analysis of variance, enable managers to get clearer insight into main business drivers, and to discover valuable patterns and trends. Frequent and flexible reforecasting ensures better intelligence for decision making which results in more informed decisions, and, consequently, in generating greater economic value [4]. According to these authors, key strengths of driver-based budgeting lie in its commitment to data-driven management, implementation of business intelligence methods, as well as dynamic financial techniques which allow better responsiveness to changes in business environment. Implementation of technology and data analytics tools in planning leads to achievement of better economic results for all stakeholders. Finally, it enables easier budgeting system deployment and maintenance, which is especially important when it uses very large databases. Software used for

planning has to be flexible to enable absorption of changes in quick and easy manner [2]. Even though driver-based modeling does not represent a new concept, with the inflow of the usage of big data, predictive analytics and advanced technological solutions, analytical tools and applications for real-time forecasting and reporting, models can be significantly extended and advanced [11],[6].

3. Advantages of implementation of driver-based budgeting for companies

According to theorists and practitioners, there are multiple benefits of driver-based budgeting. It provides time and cost savings, more accurate projections on future performance, scenario analysis, and the ability to perform cause-and-effect analysis [4]. Essaides [6] points out following key benefits: **better accuracy, data integrity, higher frequency, improved** quality **and speed of decision-making, better business support, ability to plan around key drivers, higher efficiency** and effectiveness of planning and reporting, and driving improved business performance. According to Barrett [7], benefits of implementation of driver-based budgeting are: less time necessary to produce a budget or re-forecast, requiring of fewer iterations, reduction of costs, making managers accountable, helping overcoming the calendar year fixation, providing insight and agility, reduction of risks, minimization of extrapolation, greater accuracy, enabling organizations to forecast more frequently, and minimization of "gaming". Additional benefits of driver-based budgeting involve **operational alignment, greater flexibility,** better resource analysis, quicker reforecasting with minimal effort, supporting integrated planning, establishing clear responsibility, much more realistic reviews, more insightful decisions etc.

Among the most commonly emphasized advantages of driver-based budgeting are saving time necessary to produce a budget and reduction of costs. Comparing with traditional budgeting, it requires fewer iterations and, consequently, makes budgeting quicker. It frees up time for other activities that are more value-added. Driver-based budgeting enables faster reaching of a compromise and creates less space for disagreement since business drivers are visible to all acters [7]. Since all data is stored centrally, and the calculations are made in real-time, this budgeting method enables companies to avoid the lengthy process of data submission. Data from all users can be immediately included in the calculations, for as many scenarios as needed, so that, when the figures are agreed, new budget version is ready to be used [2]. In other words, by putting focus on key drivers of business, significant time and effort necessary for creation of the initial budget, as well as for updated forecasts throughout the year, can be saved. Other major advantage of driver-based budgeting is reduction of costs, which is in line with the requirement of decreased number of iterations and the shortening of annual budgeting cycle or time to produce a mid-year re-forecast [7].

Driver-based budgeting imposes greater accountability since it makes cause-and-effect relationships more transparent. It enables insight into the reasons for decreased productivity and increased costs so even and departmental managers, who had not exceeded their budgeted expenses, can no longer avoid scrutiny [7]. Also, driver-based budgeting helps minimizing "gaming" of managers and employees who have compensation packages linked to the *realisation* of the *budgets*. Sometimes, the budgeting process was real theatre followed by aggressive negotiation between the *participants*. Driver-based budgeting has greatly reduced the ability of managers to build in slack or pad costs [13]. Also, this budgeting approach helps in reducing the pressure to improve performances by identifying the way how to do that.

Driver-based budgeting enables overcoming of the fixation on the calendar year, which is significant for many activities which cross time periods. Managers can determine the impact that any action in the presence has on future activities based on cross-period relationships [7]. This budgeting approach is very useful in helping managers to understand the true value-drivers of their business, and the manner by which various changes in these drivers influence business

outcomes in the future. As stated by Player et al. [5], the greatest benefit of using the driver-based budgeting is identification of key drivers, which enables organizations to better understand functioning of the entire business system and better insight into relationships between inputs and outputs, as well as into controllable revenue and expense items. Allowing easier determination of cause and effect relationships and, hence, easier identification of variables that caused missed projections, this budgeting approach enables more efficient managerial decision making regarding taking corrective actions and making opportunity out of unexpected occurrences in internal and external environment.

Due to allowing the impact of various business scenarios to be quickly assessed, driver-based budgeting reduces business risks and enables greater flexibility in responding to uncertain business conditions [7]. Key to the reduction of risks is using of predictive modeling, or so-called "what-if" scenarios, that enable evaluation of many different plans of action, which makes forecasting more precise and useful, especially in situations when a high degree of uncertainty exists. Driver-based budgeting has proven to be an appropriate solution when it is necessary to identify patterns and trends of performances, rather than solely to provide precise data and numbers [4]. Another advantage of its implementation is minimization of extrapolation. Even though particular line item expense, where no obvious driver can be identified, can still be increased by extrapolation of expenditure from prior period, this should be minimized in case of driver-based budgeting [7]. Focusing on the future rather than the past makes driver-based budgets more accurate since they contain significantly less extrapolation, and, therefore, less deviation of outcomes in relation to forecasts.

4. Challenges of implementation of driver-based budgeting

Despite the vast benefits, driver-based planning and budgeting still brings certain challenges, mostly related to: perceived to be difficult to implement and maintain, unfamiliarity of cost centre managers with business drivers and rules, demanded management as a process, overemphasized transparency that makes managers uncomfortable, perceived to be deterministic, unsuitability to all business units and organizations, etc. [7]. These challenges and difficulties can generate resistance to the implementation of this budgeting method, especially in case of managers without enough expertise or prior experience in this area.

One of the biggest challenges in using driver-based planning is the difficulty in identifying appropriate business drivers and understanding the impact associated with these drivers. In practice, it is often difficult to determine specific drivers due to the growing volume of business data, the complexity of today's business operations and fast changes of business environment [4]. The identification of drivers and determination of cause-and-effect relationships demands high quality of information provided from all organizational units, including financial and operating ones, so that they can be used in an integrated way, to allow making accurate predictions. A vast amount of data from various sources that is continuously enlarging, as well as necessity for their filtering, organization and integration, may represent significant obstacle for identification of key drivers, making analysis and meaningful findings. Since this is critical to successfully implementing driver-based planning, it is evident that incorrectly defined drivers can lead to weaker budgeting and forecasting. When producing a driver-based model, it is important to create one that is not too complicated and overly detailed. There is no need to add variables that do not ensure analytical benefits. It is more important to create model that is precise, actionable and focused on key performance drivers.

Top management or financial managers sometimes consider that cost center/business unit managers are not able to properly determine drivers and understand their impact. While this can be the situation with managers who are newly employed and have not yet spent enough time in the company to understand all processes, this is most often not a case with experienced managers who easily understand what induces expenses in their department. Despite the fact that driver-

based budgeting requires considerably less time and effort than other methods, it is often perceived as difficult to implement [7]. Implementation of this budgeting model requires strong knowledge about different business intelligence, statistical and business modeling tools [4]. The modeler must *have a high level of expertise* to identify rules and relationships between variables used for modeling outcomes, as well as to maintain models.

Other challenge is perceived difficulty in maintenance of driver-based models due to the necessity to adjust the structure of the model in order to make it accommodated to new business units, new products/services and new reporting structures. Business is changing and drivers and mathematical relationships are changing, therefore the planning model need to be dynamic and able to incorporate much more, and much more, varied types of data [6]. Since output generated by one department becomes the input of another, the driver-based budgeting demands to be managed as a process. It is necessary to determine and manage the sequence in which departments create budgets and reforecasts and submit them. This makes coordination between departments more complex and challenging [7].

There might be a resistance to implementation of driver-based budgeting due to increasing transparency and greater accountability. Since it minimizes the opportunities for "gaming" and contributes to greater accountability for managing resources and achieved results, some employees may feel stressed and uncomfortable. As models of driver-based budgeting use certain rules and relationships to make predictions of resource requirements and expenses, they might be perceived as "deterministic" by managers. They may consider that it is undermining their control and authority. This might also be a reason for occurrence of managers' resistance during the process of driver-based budgeting implementation.

Due to the multiple advantages of driver-based budgeting, it may appear that it is universally applicable and suitable for every company and its budgeting process. However, for some organizations, departments and budget line items, driver-based budgeting is not applicable, therefore, it cannot be used universally. In fact, it is most suitable for line item expenses in departments which have a high volume of repetitious activities and a great proportion of controllable or variable costs in the amount of total costs [7].

5. Conclusion

Since changes of business conditions represent one of the main characteristics of modern business environment, the process of planning and budgeting needs to be redesigned in order to support companies to efficiently adapt to new circumstances. This implies that sole improvements of budgeting process are not enough, instead, it is required to enable enhanced functionality of budgeting. With regarding to that, replacing traditional budgeting with driver-based model, that is essentially based on mathematical relationships between key operational drivers and financial outcomes, represents an important improvement. Driver-based budgeting is based on a dynamic model that integrates both, internal and external, financial and non-financial drivers. Key strengths of this budgeting approach lie in its commitment to data-driven management and implementation of business intelligence tools. It enables more dynamic predictions, projecting and evaluating of various scenarios before starting certain actions and, therefore, greater responsiveness to continuously changing in business environment.

In comparison with traditional budgeting, driver-based budgeting possesses multiple advantages for companies that help them to react in more agile way. It enables more frequent forecasting and easy and quick re-forecasting, demands fewer iterations and creates less costs. Also, it facilitates identification and understanding of key business drivers, makes cause-and-effect relationships more transparent and contributes to better alignment of strategic, operational, and financial plans of the organization. By allowing improved insight into controllable revenue and expense items, the implementation of this budgeting method significantly improves flexibility of organizations in

responding to internal and external changes and provides necessary agility in business. As a consequence of all of the benefits and improvement brought by driver-based budgeting, companies can achieve better overall performances and economic results.

Besides many positive sides, implementation of driver-based budgeting also brings certain challenges for companies. Some required changes that are brought by this method, as well as perceived difficulties with its implementation and maintenance may be a reason for resistance. Also, it cannot be considered to be universally applicable, even though it represents adequate method for many companies and provide enhanced results.

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