



TOWARDS AN EFFECTIVE E-GOVERNMENT: IMPLEMENTATION OF A BALANCED SCORECARD IN THE PUBLIC SECTOR

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Abstract. Effective e-government presupposes proper application of the information and communications technology (ICT) as well as an effective management system in order to improve the economics of the public sector. The budget with which the public sector organizations start their new strategic planning cycle should be partially used to enable their organizational efficiency. This is done through the implementation of the new ICT and employees' education. Having improved business processes supported by ICT and educated employees will cause the citizens to be satisfied with the level of service of that public organization. As a consequence, this will justify the budget allocated for the public organization and its mission will thus be fulfilled. Such a chain of cause and effect, that can significantly improve public sector economics, is in the very nature of a Balanced Scorecard (BSC) methodology, when used for managing the organization. A clear definition of goals and natural strategy definition and implementation using BSC will lead the organization towards its goals by executing the right activities with the optimal resources usage. For the BSC management model to be successfully implemented and effectively applied in public sector organizations, the following four preconditions are indispensable: (1) guidelines and strategic goals sent by the government to state and public organizations need to be clear and unambiguous; (2) a public organization's management needs to have an insight into the application of the BSC method and partly change their managerial habits; (3) operative procedures of the application of the BSC method in an organization need to be clearly defined; (4) an organization needs to have a central information system (IS) to which the application/software that the BSC model is to be implemented in will be connected.

JEL Classification H-110.

Keywords: e-government, performance measurement, public sector, Balanced Scorecard, implementation methodology, management, measurement software.

Reikšminiai žodžiai: e. vyriausybė, veiklos matavimai, viešasis sektorius, subalansuoti rodikliai, įdiegimo metodologija, vadyba, vertinimo programinė įranga.

1. Introduction

Performance measurement in organizations is not a novel concept. Research shows that all the preconditions for performance measurement had been fulfilled by the late 19th and early 20th century (Williams, 2004). The first concrete performance measurement was conducted within The Center for Urban Research in New York. Performance measurement has been developing as a professional and scientific

field of expertise ever since. However, whereas in the beginning performance measurement was closely connected to budgeting, and was therefore used to estimate an organization's financial performance, nowadays it is used to manage organizations. Although performance was initially measured in public sector organizations (Williams, 2004), nowadays it is quite common in both public and private sector organizations. In addition, initially organizational performance used to be measured on the easily qu-

antifiable operational level, whereas nowadays it has become possible to measure also the realization of an organization's strategic goals. In the early 1990s, R. Kaplan and D. Norton laid the foundations of the currently most popular measurement method in the domain of organizational performance measurement – the method of balanced scorecard (BSC) (Kaplan and Norton, 1992, 1993). By means of a strategic map of goals and measures, this method enables the so-called strategic measurement, which focuses on measuring the success of a management's strategic hypotheses, as opposed to common diagnostic measurement conducted at the organization's tactical and operational level. Since it was introduced, BSC has developed into a method of management by measuring the realization of an organization's strategic goals, in other words, as the 'measure to manage approach'. The development of this method was extensively covered by various publications (Kaplan and Norton, 1996a, 1996b, 2001, 2004; Niven 2002). Although the BSC method appears natural and self-explanatory at its core level, and as such lends itself easily to supporting the management of both public and private sector organizations, ways of its implementation and its operative usage have not been fully researched. The interdependence between the BSC management model and the organization's information system has not been fully examined either (Kaplan and Norton, 2001; Marr, Neely, 2003). This has led the Ministry of Science, Education and Sports of the Republic of Croatia to finance a scientific project aimed at establishing a natural and clearly defined method of implementation of the BSC model in organizations, with the support of the appropriate software (Development, 2007). Having worked together for several years, the members of the project team have devised a unique methodology of the BSC management model development (Tomičić, 2006) and implementation. This methodology was tested on specific organizations in both private and public sector. Currently two workshops on the application of the BSC method are being conducted at the Ministry of Defense of the Republic of Croatia. In addition, the authors of this paper participate in a project in which the Mykolas Romeris University in Vilnius, Lithuania, is involved as the project holder (Citizens, 2007), aimed at determining the guidelines for developing e-government in Lithuania. This paper presents one of the outcomes of the afore-mentioned activities, especially in the segment of the operative usage and implementation of the BSC method.

2. BSC method implementation and e-government

In its 75th anniversary issue, the Harvard Business Review assessed the BSC method as one of the 15 key management concepts to have been introduced to the public through scientific and professional papers. The application of this method has led to its further development in both public and private sector. BSC can be successfully applied only if it is perceived as a segment within the entire process of strategic planning (Andersen et al., 2001), that is, as a part of the entire strategic continuum (Kaplan and Norton 2001). Accordingly, the major boost to the application of the BSC model in the public sector was provided by the U.S. Congress, which passed the Government Performance and Results Act (Government, 1993) proposed by the Vice President Al Gore in 1993. In accordance with this legally binding document, all federal agencies and ministries in the United States were obliged to adopt strategic planning processes (Bryson and Alston, 1996) and performance measurements by 1998. All state organizations were thereby obliged to develop their strategic plans as well as performance measurement plans. The latter were predominantly based on the BSC method.

Apart from the fact that this method needs to be implemented within the entire strategic planning effort, it is extremely important for both this method and the BSC management model developed on its basis to be supported by a central information system pertaining to the organization. The BSC model needs to be automated and supported by means of appropriate software (Marr and Neely, 2003), whereas the required measurement data is to be provided by the organization's central database. The U.S. Congress made a vast contribution to the public sector by passing the Information Technology Management Reform Act (Information 1996) in 1996. This act obliged all state organizations to develop a strategic plan of development and application of information and communications technology (ICT). This made it easier for public organizations to develop their central information systems, as well as encouraged the development of the ICT support to performance measurement. There are numerous examples of the BSC method implementation in organizational management outside the United States as well, many of which have been described in literature (Haapasalo et al., 2006; Randor 2003; Penić et al. 2005). The preconditions for proper implementation of the BSC method were analyzed as well (Assiri, 2006). Through their involvement in an international pro-

ject (Courses, 2007) the authors of this paper have participated in training a number of employees of the state administration of the Republic of Croatia on development and application of the BSC management method. This training is a part of a coordinated effort toward preparing employees in state and public administration for e-government. The importance of performance measurement for e-government was additionally discussed in the workshop on performance measurement in the public sector (Dobrović, 2007) during the conference held within the aforementioned international project (Citizens, 2007). During the conference, representatives of several countries exchanged their experiences on introducing e-government, as well as those on the importance of performance measuring in public organization management.

3. Operative usage of the BSC method in the public sector

In the public sector organizations, the BSC method enables the measurement of the realization of their strategic goals, and consequently, the fulfillment of their mission. In case of public and state sector organizations, these goals are determined by the government through their strategic documents (such as the operating program of the government). With a view to an easier implementation and usage of the BSC model in organizational management in the public sector an Activity Flow Diagram (AFD) has been developed. This diagram (Figure 3.1.) shows the operative usage of the BSC model. The basic concepts contained within flow diagrams are the following:

- Roles: functional names of particular positions (roles) included in the operative usage of the BSC model. The roles are shown as horizontal lanes. In each public/state sector organization, there are four such functional roles: the government (the superordinated organization), the organizational management (minister, manager, director, etc.), BSC model administrator and the public organization's database (DB) administrator. All the activities (boxes) within the lane pertaining to one functional role are performed by that role.
- Flows (arrows): relationships between activities (boxes) of the diagram. In case the diagram shows the operative usage of the BSC model, these flows are informational. They are generated by one activity, and used by another.

- Activities (boxes): sets of activities and decisions by means of which particular functional roles within an organization use or enable the usage of the BSC model.

The activity flow diagram is a graphical semi-formal representation of the application of the BSC model aimed at managing a public organization. In short, it shows instructions for the operative usage of the BSC model. Since this model provides support to management, most activities inherent in its usage are assigned to the management of a particular public organization. The BSC model administrator and the database administrator support positions (functional roles) ensuring the correctness of the BSC model and keeping it up-to-date, as well as providing values required by the model's metrics.

3.1. Activities inherent in the BSC model usage

All the activities inherent in the operative usage of the BSC model are described in this section.

BSC model updating. BSC model updating is a continuous activity conducted by the BSC model administrator throughout a strategic management planning cycle (Bryson, 1996). The updated BSC model allows the management to manage the organization. The BSC model administrator updates the model in three ways: (1) by developing a new model for the next organizational development period (strategic planning cycle), (2) by validating the developed model so as to examine its correctness and its possibility of being used by the management and (3) by periodically checking the BSC model correctness, once it has been introduced.

Identifying Activities for Strategy Implementation. Strategy implementation requires the identification of activities which, when performed, will reflect the organizational behavior as defined by its strategy. Strategy implementation may imply more than one activity.

Defining Strategies. The management defines strategies to be used for realizing strategic goals. To each strategic goal particular strategies forming one strategic topic will be assigned.

Defining Strategic Goals. By defining strategic goals the management can quantitatively express their vision in concrete terms. By rendering the vision concretely, the coordinates of the 'to-be' state that the organization is to achieve upon the termination of a particular period for which the goals have been defined, are given.

The approved vision is used by the management as the basis for defining the organization's strategic

goals. The strategic goals proposal is sent to the governmental agency for approval. The proposal can be returned to the management in case there are any objections concerning it on the part of the governmental agency.

Defining Vision. A vision refers to the image of an organization in the near or distant future (the 'to-be' state after a one- or two-year period, etc.) and through its definition the management aims to direct organizational processes with a view to realizing the vision.

Identifying SWOT Elements. The management estimates the organization's readiness for realization of strategic goals. This readiness is estimated for each goal separately, by using SWOT analysis. The strengths (S), weaknesses (W), opportunities (O) and threats (T), which will either contribute to realization of each particular goal, or be hindrance to it, are identified.

Data Source Creating. If the measure is such that it is located at the bottom of the chain of cause and effect, and thus does not depend on any other measure, with no equivalent value of that measure in the organizational database, the database administrator creates a new data source in the form of a questionnaire, etc.

Approving Strategic Goals. By approving the strategic goals proposal, the government confirms the management's opinion regarding the compatibility between the goals and the vision. Such goals are described by the attribute 'strategic' owing to the fact that they are approved by the government, and are thus of key importance to the organization as a whole. The remaining goals to arise from strategic goals do not carry any particular attribute and are simply referred to as 'goals'.

Vision Approving. By approving the vision, the government opts for a future course of development of a particular public organization and thus provides the basis for defining their strategic goals. All the further efforts on the part of the management will focus on leading the organization during a particular period in accordance with the state described by the vision.

Defining Activity Goals. The goals to be realized by conducting the strategy implementation activities need to be clearly defined. These goals are linked to strategic goals by means of particular strategic topics.

Identifying Metrics. For each goal its particular metrics (either a single metric or several metrics) to be used for quantitative expression of the realization of the goal are defined.

Determining the Development Policy. The government determines the development policy of the

sector that a particular public organization pertains to. In this way a framework which that organization is to fulfill in the subsequent period is roughly defined.

Determining Relationships among Measures. Both measures and goals to be measured by means of metrics are mutually interconnected. Owing to that, the management needs to determine all the existing relationships and define the cause and effect chain of measures.

Preparing BSC Model Validation. By defining the cause and effect chain of measures the BSC model development is terminated. The next step is preparing the model validation, in other words, checking the extent to which the model matches the reality.

Extending DB Functionality. For measures whose values cannot be obtained from the existing database, other sources of data are defined. The structure of these sources of data (e.g. questionnaires) can be integrated within the existing database as an additional functionality, so as to avoid the need to calculate and enter the measure values manually.

Feeding Metrics. Each metric needs to be fed with information on a measure value. Only after all metrics have received information on the current measure value can the BSC model be used for managing the organization by means of the cause and effect chain of measures.

S,W,O,T Elements Ranking. S,W,O,T elements obtained by ranking are mutually compared in a way that all S elements are mutually compared, followed by W elements, O elements, and, finally, T elements. In this way the ponder assigned to each strength, weakness, opportunity and threat depending on whether they support or hinder the goal realization, is obtained.

Strategies Revision. In case the correctness of the model has not been confirmed by the validation procedure, the management needs to investigate the cause and effect chain of goals, that is, the strategies which the goals have arisen from. Strategies revision is aimed at placing the differences between the calculated values (model) and the obtained values (reality) of the measure values within the tolerance ranges of the model.

Managing by BSC Model. By using the BSC model, the management can manage the organization and lead it toward the realization of its strategic goals. By relying on the BSC model, the management process is simplified.

Defining Relationships among Goals. The goals should not be perceived as individual entities, as some of them as mutually interconnected, that is, there is a cause and effect chain within which the goals can be placed. Strategic goals are at the top of this

chain, whereas all the other goals, being connected by cause and effect relationships, contribute to the realization of the strategic goals.

Model Validating. By model validating the correctness or incorrectness of the model is confirmed. The validation is necessary, as the management relies on the model in managing the organization. In addition, a functional model is a proof that the strategies – that is, the goals and relationships among them – were properly selected.

Central DB Administrating. The central database (DB) of an organization is used for feeding the metrics by taking readings of the measure values held in the database. In case any new measures occur, the database is functionally extended so as to be able to hold its values as well.

3.2. BSC model usage in a single strategic planning cycle

Figure 3.1. shows the activity flow diagram of the operative usage of the BSC model. There are four positions (functional roles) defined within the model: the Government/the Strategic Development Agency, the Manager of a Public/State Organization, the BSC Model Administrator and the DB Administrator. They perform activities described in section 3.1. (in this section they are printed in **bold**). Activities are either the starting points or the end points of particular information flows shown in Figure 3.1. (in this section they are *italicized*).

At the beginning of each new strategic planning cycle the Management (e.g. the minister and his/her associates) conducts the activity called **Defining the Vision** of the Public/State Organization, that is, creating the overall framework of the organization to be achieved upon the termination of a strategic planning cycle. A *Vision Proposal* is delivered by the Management to the Government/Governmental Agency for consideration. During the activity called **Vision Approving**, the Government either approves the *Vision* and delivers it to the Management for further action or fails to approve the *Vision Proposal* and returns it to the Management for improvement. The approved *Vision* is also delivered to the BSC Administrator for **BSC Model Updating**. On the basis of the *Vision*, the Management conducts the activity called **Defining Strategic Goals**. The obtained *Strategic Goals Proposal* is delivered to the Governmental Agency for adoption. If this proposal is approved, *Strategic Goals* are delivered to the BSC Administrator, who enters them into the model by means of **BSC Model Updating**.

The Management estimates the organization's readiness for realization of *Strategic Goals* by conducting the activity called **Identifying SWOT Elements**. The *S,W,O,T* elements are entered into the model by means of **BSC Model Updating**, and the significance that individual elements have for realization of strategic goals is assigned to those elements by the Management through the activity called **S,W,O,T Elements Ranking**. The obtained *S,W,O,T Rank* is entered into the model by means of **BSC Model Updating**, and is used by the Management for **Defining Strategies**, so as to ensure that the obtained *Strategies* are sustainable and realistic. *Strategies* are entered into the model by means of **BSC Model Updating**. For each of the *Strategies* the Management needs to engage in **Defining Activities for Strategy Implementation**, whereby each individual strategy will be put into effect. The BSC Administrator enters the *Activities* into the model by means of **BSC Model Updating**. Each *Activity*, regardless of whether it has already been performed in the organization or not, is aimed at fulfilling a particular goal. The Management engages in **Defining Activity Goals**. The *Goals* are entered into the model by means of **BSC Model Updating**. Their significance is twofold. Firstly, all the *Goals* are in mutual cause and effect relationships arising from the fact that the realization of individual goals affects the realization of some other goals. Owing to that, the Management conducts the activity called **Defining Relationships among Goals**, resulting in the *Cause and Effect Chain of Goals*, to be entered into the BSC model by means of **BSC Model Updating**. Secondly, for each goal its metrics need to be defined, to enable the tracking of the realization of that particular goal. The activity called **Identifying Metrics**, conducted by the Management, has two outcomes. Firstly, for each goal the following components of its metrics are identified: *Measure*, *Target Value* and *Responsible Component* as well as *Measurement Frequency*. These metrics components are entered into the BSC model by means of **BSC Model Updating**. Secondly, the *Metrics* as a whole, along with the *Cause and Effect Chain of Goals*, are used by the Management for **Determining Relationships among Measures**. The set of all these relationships makes a *Cause and Effect Chain of Measures* containing the entire logic of behaviour of the BSC model. It is entered into the BSC model by means of **BSC Model Updating** by the BSC Administrator. This is where the set of activities connected to the BSC model development is completed.

Another set of activities encompasses feeding the metrics with the appropriate measures (measure

values). **Metrics Feeding** is conducted by the BSC Model Administrator when the model needs to go through the validation procedure or when the state of fulfillment of goals needs to be presented to the Management. The BSC Model Administrator selects the *metrics* from the model and searches the organizational database for its measure value by making a *Measure Value Query* against the database. If the database already contains the measure value, then the activity called **Central DB Administrating**, conducted by the Database Administrator, allows for the reading of the *Measure Value* to be taken. If a certain measure value is not held within the database, a *Request for New Data Source* will be made, on the basis of which the Database Administrator of the BSC model proceeds with **Data Source Creating**. The *New Data Source* created in this way is used by the Database Administrator for **DB Functionality Extending**. The outcome of this activity is a *Data Source Relational Schema*, on the basis of which the Database Administrator, by conducting the activity called **Central DB Administrating**, reports this relational schema to the organizational database management system.

The following set of activities encompasses BSC model validation. By using the *Cause and Effect Chain of Measures* and *Measure Values* from the organizational database, the BSC Model Administrator conducts the activity called **Preparing BSC Model Validation**. Through this activity, the Administrator compares the measure values obtained by means of the BSC model logic against readings of values of the same measures taken from the organizational database. The difference *Model vs. Reality* is the basis for **Model Validating**. If this difference lies within the predefined tolerance ranges, the *Model Correctness Confirmation* signals the Management to engage in **Managing by BSC Model**. If the difference exceeds the predefined tolerance ranges, the *Model Incorrectness Confirmation* signals the Management that the model is incorrect and therefore the activity **Strategies Revision** needs to be undertaken, with the view to determining the reasons for the divergence between the model and reality. For strategies to be revised, the Management needs to have the existing *Strategies* entered in the model at their disposal. The outcome of **Strategies Revision** are *Revised Strategies*, to be entered into the BSC model. These *Revised Strategies* are used by the Management for **Identifying Activities for Strategy Implementation**, aimed at defining new activities to enable the implementation of the revised strategies. This is where a new cycle of the BSC model development starts.

When the difference between the BSC model and reality lies within the predefined tolerance ranges, the Management engages in **Managing by BSC Model**, whereby it starts to rely on the management model. This model needs to be periodically checked by comparing the measure values calculated by the model against real measure values from the organizational database or another similar source. The outcome of **Managing by BSC Model** are *Strategic Goals Realization Reports*, to be used by the Government for the activity called **Determining Development Policy** of the organization in the next strategic planning cycle.

4. Competences required for using the BSC method of management

When the management of a public/state organization is considered, managing by performance measurement represents a shift in management philosophy. This management method, that is, introducing the managing by measurement system, calls for cooperation within the management team. In such circumstances, the effort to be undertaken by the management encompasses the following three components:

- *Increasing teamwork intensity*. In joint meetings between, for instance, the minister and his/her associates, key topics essential for the survival of the organization are discussed: strategic goals, strategies of achieving strategic goals, metrics for measuring the realization of goals, strategies revision, etc. Therefore, not only does the management need to increase their cooperation, but the topics to be discussed need to have more relevance to the future of the organization.
- *Increasing teamwork frequency*. No matter how good the BSC model developed by the management, it needs to be checked. The monitoring of the model implies weekly (or daily, in case of emergency) management meetings in which control measurements by using the model are conducted, to be compared against the real values obtained from the organizational DB or in a similar way. In that respect, preventive (planned) checks of the management model will yield best results, as they will ensure that, in case the organization fails to adhere to one of its strategic goals, the consequences are kept to a minimum.
- *New fields of expertise* that the management needs to familiarize itself with (managing by measurement, strategies, strategic maps,

metrics, etc.) will ensure that the management easily adopts the new method of management by means of using the BSC model. The more insight the management has into this new method of management, the sooner it will acquire the skill of managing by the BSC model.

In accordance with the aforementioned components, the following fields of expertise in which the management needs to be additionally trained are the following:

- *Teamwork,*
- *Resource (time) planning,*
- *Strategic planning and performance measurement (Balanced Scorecard).*

To be able to develop and update the organizational management model, the BSC model administrators need to have insight into the basics of the managing by measurement method. Additionally, they need to be proficient in software aimed at supporting the management of the organization and the one that the BSC model is to be rendered in. To be able to communicate efficiently with the management, and with the view to updating the BSC model, the BSC model administrator needs to understand the way in which individual elements of the BSC model are defined by the management. In accordance with that, the following fields of expertise in which the BSC model administrator needs to be additionally trained are the following:

- *Basics of performance measurement*
- *Using the tool that the BSC model is to be rendered in.*

The database administrator needs to be able to functionally extend the organization's existing database. Apart from proficiency in data modeling and the database management system used by the organization, the database administrator is not likely to require any other specific skills.

The existing roles, as well the new ones to be defined by the organization with a view to using the BSC management model (the government/the governmental agency, the management of a public/state organization, the BSC model administrator and the DB administrator) need to be assigned to the employees/institutions, after which the chosen employees need to be trained in the aforementioned fields. The completion of such training is the necessary precondition for successful implementation of the BCS method in managing public sector organizations, that is, e-government organizations.

5. Software to support the BSC method

As the BSC method evolved adequate software products were developed to support its development and implementation. Presently we have various BSC software vendors and we can broadly classify them in two categories – stand alone and integrated in other software environments most often ERP systems and data warehouses.

Stand alone products are independent products offered on the market and they support development of scorecard while run time functionality is usually performed by manual entry of performance indicators or predefined spreadsheet files. Their automatism is limited which means that they have calculators for derivation of values of dependent measures based on manually entered or predefined set of independent variables. Standalone products usually have software connectors towards spreadsheets and some other simpler data formats. They provide relatively fast entrance into BSC use within organization without long lasting implementation, preparation of business processes and software adjustments.

Integrated BSC modules lie on a top of software systems which collect data across the enterprise through various business processes. This means that certain performance indicators can be collected automatically immediately at the moment of transaction. This is quite good solution for financial transactions, and also some operational indicators like production, sales, etc. However, quite often is the case that such indicators in their "raw" format are not suitable for BSC. They should be integrated and consolidated for given BSC context. This also applies to various frequencies of data that are collected by transaction systems. These frequencies might vary significantly and for putting them into context of BSC requires that frequencies and census data are aligned, in order to come up with correct conclusions. And finally, significant amount of measures which are usually entered in BSC systems (e.g. customer satisfaction) are not entirely collected by standard ERP systems and require manual or spreadsheet entry.

Therefore we might draw the conclusion that despite aggressive marketing of various ERP vendors integrated BSC modules are not significantly better than stand alone.

Conclusions

For the concept of e-government to be fully realized, the following preconditions need to be fulfilled: (1) public/state organizations need to reengineer their business processes so as to benefit to the highest

possible extent from the advantages of information and communications technology (ICT); (2) employees in these organizations need to be trained for the new method of work and management; (3) contemporary management methods need to rely heavily on ICT thus enabling the management to make proper decisions. One of the management methods to potentially exploit ICT, through the organization's central IS, is managing by performance measurement. The most commonly used method of managing by measurement is the balanced scorecard method. For the BSC method to be used effectively, the way of implementing it needs to be simple and clear. This paper presents a standard operative procedure of implementing this method in public/state organizations. The precondition for successful implementation of the BSC method in the public sector is a clearly defined vision of development of the country's individual regions on the part of the government. A clear vision will enable the public/state organizations to define their own strategic goals, which represent the main input for defining the BSC management model. Nevertheless, this model will be successfully used in organizational management only provided it is automated (supported by appropriate software) and in case the organization has developed its own central information system used as a means of feeding the BSC model.

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EFEKTYVIOS ELEKTRONINĖS VALDŽIOS LINK:
SUBALANSUOTŲ RODIKLIŲ TAIKYMAS VIEŠAJAME SEKTORIUJE

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Santrauka. Tinkamas informacinių ryšių technologijų taikymas ir efektyvių valdymo sistemų diegimas sudaro sąlygas taikyti efektyvesnius elektroninio valdymo metodus siekiant užtikrinti ekonominių rodiklių viešajame sektoriuje gerinimo priemones. Organizacinio efektyvumo tikslams galėtų būti iš dalies naudojamas ir perskirstomas biudžetas, kai viešojo sektoriaus organizacijos pradeda naują strateginio planavimo ciklą. Tai atliekama diegiant naujas informacines ryšių technologijas (IRT) ir keliant darbuotojų kvalifikaciją. Toks veiklos procesų gerinimas, grindžiamas IRT galimybėmis ir kvalifikuotu personalu, galėtų turėti įtakos gyventojų pasitenkinimui šių viešųjų organizacijų teikiamų paslaugų lygiu. Tai garantuotų biudžeto skirstymą viešosioms organizacijoms, atsakingoms už padarinius, ir taip jų misija atitiktų sąlygas. Toks įtakos efekto grandinės vertinimas, kai ši grandinė leidžia pagerinti viešojo sektoriaus ekonomiką, panašus į subalansuotų rodiklių metodologiją, taikomą organizacijų vadyboje. Tinkamas tikslų ir strategijos apibrėžimas ir jų vykdymas taikant subalansuotus rodiklius, nukreiptą organizaciją link tinkamo tikslo įvykdymo, atliekant reikiamus veiksmus ir optimaliau naudojant išteklius. Siekiant sėkmingai viešojo sektoriaus organizacijose įgyvendinti ir efektyviai taikyti subalansuotų rodiklių valdymo modelį, būtinos keturios sąlygos: 1) vyriausybės valstybinėms ir viešosioms organizacijoms perduodami nurodymai ir strateginiai tikslai turi būti tikslūs ir nedviprasmiški; 2) viešosios organizacijos valdymas reikalauja turėti išvalgumo taikant subalansuotų rodiklių metodą ir iš dalies keisti savo vadybines išvalgas; 3) operatyvios procedūros organizacijoje taikant subalansuotų rodiklių metodą reikalauja aiškaus apibrėžimo; 4) organizacija turi turėti centrinę informacinę sistemą, kurioje būtų įdiegta taikomoji programinė įranga, leidžianti susieti taikomuosius subalansuotų rodiklių modelius.

Željko Dobrović obtained his doctorate degree at the Faculty of organization and informatics, University in Zagreb, Croatia. He completed his post doctorate studies at the National Defense University, Information Resources Management College, Washington DC. Now he is an assistant professor at the Faculty of Organization and Informatics. Professional areas of interest are strategic planning and information systems development, process modeling and management, management of organizations, management by performance measurement. He is the author of about thirty scientific and professional papers from the areas identified. In 2007 he received the CIO Certificate from the National Defense University, Washington DC. Besides working at the faculty, his professional CV includes working in public and private sector organizations on different assignments, mainly management and IS development. He conducts seminars on management and IS development for public and private sector organizations. He also participates in professional IS and management implementation projects.

Željko Dobrović apgynė daktaro disertaciją Kroatijos Zagrebo universiteto Organizacijos ir informatikos fakultete. Vėliau studijavo Vašingtono Nacionalinio gynybos universiteto Informacinių išteklių valdymo koledže (National Defense University, Information Resources Management College, Washington DC). Šiuo metu yra Zagrebo universiteto Organizacijos ir informatikos fakulteto docentas. Mokslinių interesų sritys yra strateginis planavimas ir informacinių sistemų vystymas, procesų modeliavimas ir valdymas, organizacijų valdymas bei vadyba, pagrįsta veiklos procesų vertinimu. Ž. Dobrović yra daugiau nei trisdešimties minėtų sričių mokslinių ir profesinių straipsnių autorius. 2007 m. gavo Vašingtono nacionalinio gynybos universiteto CIO sertifikatą. Taip pat dirba viešojo ir privačiojo sektoriaus organizacijose pagal pavedimus, daugiausia valdymo ir informacinių sistemų vystymo srityse, veda seminarus valdymo ir informacinių sistemų plėtros klausimais viešojo ir privačiojo sektoriaus organizacijoms, taip pat dalyvauja moksliniuose informacinių sistemų ir valdymo sprendimų įgyvendinimo projektuose.

Martina Tomičić has graduated at the University of Zagreb, Faculty of Organization and Informatics in Varaždin and since 2003 she is involved in a postgraduate study and working on her doctorate thesis in the field of Information sciences. She is employed at the same faculty as a teaching assistant at the department for Information Systems Development, participating in lectures on "Operations management", "Business process modeling" and "Performance measurement". She worked on different projects on strategic planning of information systems, including the use of contemporary CASE tools, strategic planning of ICT and performance measurement. Currently, she actively participates in a TEMPUS project „Institution building in Croatia – e-Government”, financed by the European Commission.

Martina Tomičić yra baigusi Zagrebo universiteto Varaždino informatikos ir organizacijos fakultetą ir nuo 2003 m. studijuoja magistrantūroje bei rengia informatikos mokslų srities daktaro disertaciją. Šiuo metu taip pat dirba asistente Informatikos ir organizacijos fakulteto Informacinių sistemų katedroje, skaito procesų valdymo, verslo procesų modelių bei veiklos procesų vertinimo paskaitas. Martina Tomičić taip pat dirba informacinių sistemų strateginio planavimo srities projektuose, apimančiuose informacijos ir komunikacijos technologijų strateginį planavimą ir veiklos procesų vertinimą. Šiuo metu aktyviai dalyvauja TEMPUS projekte „Institucijų kūrimas Kroatijoje – e.valdžia“ („Institution building in Croatia – e-Government“), finansuojamame Europos Komisijos.

Neven Vrček is an associate professor at University of Zagreb, Faculty of Organization and Informatics (FOI), Varaždin, Croatia. He graduated at the Faculty of Electrical Engineering of the University of Zagreb, and at the same faculty he finished his master studies, and obtained a Ph.D. degree. Besides formal education he attended study visits and extensive seminars at universities in Europe and USA, and international companies. After graduation, on 1991, Neven Vrcek started his professional career in company Information and Project Center (IPC) in Cakovec. He started working at FOI in 1996. He was a vice-dean for science and international relations of FOI from 2003/04 to 2006/07. Also, he is a member of the Committee for Information Society of the Republic of Croatia. Currently, he is the head of the postgraduate doctoral study program "Information Sciences" at FOI. He is an editor of the scientific journal "JIOS – Journal of Information and Organizational Sciences". He is a member of the Programme Committee of the international conference "CECIIS – Central European Conference of Information and Intelligent Systems", and initiator, as well as coordinator of the Informatopolis – Open Day of the Public Administration, that has been organized in the frame of CECIIS last 2 years. During his work at FOI he participated at numerous conferences and has published numerous scientific and professional papers. Part of his research he generates in the framework of scientific projects. Currently he coordinates a scientific project „Methodology of Development and Application of Service Oriented Architecture of IS“, funded by the Ministry of Science, Education and Sport of RH and TEMPUS IB project eGovCRO „Courses for Institution Building in Croatia –eGovernment“.

His scientific and professional interests are focused on design and development of information systems, optimization of IS, and research on modern ICT impact on society and business. Besides scientific efforts he is active in business and public sector as a consultant for strategic planning of IT implementation and application in many different public institutions and private companies.

Neven Vrček yra Zagrebo universiteto Organizacijos ir informatikos fakulteto docentas. Jis baigė Zagrebo universiteto Elektros inžinerijos fakultetą, čia apsigynė magistro darbą ir daktaro disertaciją. Taip pat mokėsi Europos ir JAV universitetuose bei kompanijose. Savo profesinę karjerą pradėjo 1991 m. kompanijoje „Informacijos ir projektų centras“. Organizacijos ir informatikos fakultete pradėjo dirbti 1996 m. N. Vrček 2003–2006 m. ėjo prodekano mokslui ir tarptautiniams ryšiams pareigas. Šiuo metu jis yra Kroatijos Informacinės visuomenės komiteto narys. Organizacijos ir informatikos fakultete vadovauja doktorantūros krypties informacijos mokslų studijoms. Dirbdamas fakultete publikavo daugybę mokslinių ir profesinių straipsnių, dalyvavo konferencijose. Taip pat yra mokslinio žurnalo „Informacijos ir organizacijos mokslai“ redaktorius, dalyvauja tarptautinės konferencijos „CECIIS – Central European Conference of Information and Intelligent Systems“ programos kūrimo komiteto veikloje, pastaruosius dvejus metus iniciavo ir koordinavo Viešojo administravimo atvirąsias dienas prie CECIIS darbo grupės. Didžioji dalis jo tiriamųjų darbų yra atliekama kaip sudėtinė mokslinių projektų dalis. Šiuo metu N. Vrček vadovauja nacionaliniam moksliniam projektui „Į paslaugas orientuotų informacinių sistemų vystymo ir vartojimo metodologija“ bei TEMPUS programos projektui „Elektroninės valdžios instituciniai pokyčiai Kroatijoje“. N. Vrček moksliniai ir profesiniai interesai yra orientuoti į informacinių sistemų kūrimą ir tobulinimą, informacinių sistemų optimizavimą bei modernių informacijos ir komunikacijos technologijų įtakos visuomenei ir verslui tyrimus. Be to, jis informacinių technologijų diegimo, panaudojimo, strateginio planavimo verslo ir viešajame sektoriuose klausimais konsultuoja viešąsias institucijas bei privačias kompanijas.