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Marek Prokůpek

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Performance Measurement of Public Art Museums

Author: Ing. Marek Prokupek
Supervisor: prof. Václav Riedlbauch
Consultant: Dr. Anna Janištínová

Declaration of Authenticity

I hereby declare that the dissertation thesis presented herein is my own work, or fully and specifically acknowledged wherever adapted from other sources. This work has not been published or submitted elsewhere for the requirement of a degree programme

In Prague, on _____

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Title of the Dissertation Thesis

Performance Measurement of Public Art Museums

Abstract

The issue of the economics of cultural institutions, their economic impact, and measurement of their performance has been paid systematic attention basically only in the past few years. PhD thesis analyses the methods of performance measurement in public art museums and creates economic models. Aim of my thesis is also to create a model for museum managers to measure the performance. Nowadays it is almost necessary to integrate performance measurement system in organization's strategy decision making. The museum managers feel the pressure to prove that their organization is performing well by various stakeholders and we perceive the idea that multidimensional performance measures could fill the informational gap concerning performance, quality, and the artistic value of cultural programs. The mixed research method was employed in this research. Qualitative data was obtained from the questionnaire and interviews. Quantitative data was obtained from the questionnaire, annual reports and reports of The National Information and Consulting Centre for Culture (NIPOS). The aim of this study is to propose a comprehensive multidimensional model to assess art museum activities. This model takes into account the scope and character of museum's mission. This model consists of implementation of Data Envelopment Analysis into Balanced Scorecard.

Key words: art museums, museum management, performance measurement, DEA, BSC

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1. INTRODUCTION TO THE THESIS

1.1 Introduction

The issue of the economics of cultural institutions, their economic impact, and measurement of their performance has been paid systematic attention basically only in the past decades. Performance assessments are traditionally connected primarily with entrepreneurial subjects, which is why this assessment was applied primarily to financial metrics. During the 1990s, this issue began to be examined from a new perspective. The question arose whether it is relevant to restrict performance measurement only to financial indicators. More and more, the opinion began to appear that for measurement to be truly useful, it must also focus on non-financial indicators. Gradually this idea began to be promoted, mainly in the cultural and artistic non-profit area.

There are several definitions of the museum, for the purpose of this doctoral thesis I use the definition by International Council of Museums stated in the Code of Ethics for Museums (2013, p.1). “*A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.*“

Because the art museums are generally not-profit organizations and therefore they do not have the same opportunities to achieve global value as for-profit firms, the question of evaluation is more and more important and complex for art museums (Paulus, 2003).

It is precisely with museums that we see the need to implement performance indicators. Some museums have already partially made performance measurement part of their strategic management. But why museum managers should measure the performance of art museum? A lot of art museums have been asked to reduce their total cost functions while developing programs geared to a wider audience and to expand their research on collection. In this situation museum managers should answer the questions whether the current resources are allocated efficiently and whether museum activities and services provide value for money. To answer those questions managers need measures and indicators of their performance. Performance measurement improves management practice, provides essential information to management by enabling activities to be monitored on a regular basis at several levels within the organization. Performance measurement also provides information for strategy post-mortems when policies, management practices and methods are evaluated (Jackson, 1991).

I have decided to do this research mainly because of a lack of methods to evaluate the performance of art museums, along with evidence of the need for such a methods based on the increased demand by the public for high standards of transparency and accountability.

Currently Ministry of Culture of the Czech Republic wants to introduce a system of accreditation for museum at national level. Czech museums should be prepared for this challenge and therefore they should start to monitor their performance. Museum managers and their founder have not paid systematic attention to the topic of performance measurement that is clear from the list of the studies and also from the interviews with museum professionals. Nowadays when there is a strong pressure on museum managers and directors to be accountable, prove their existence and efficiency, it is even surprising that most of museum in the Czech Republic have not introduced almost any managerial tool to measure their performance.

If museum managers want their institution to be successful, they should answer this question: Are current resources being allocated efficiently and if they are being employed in such a way that will have maximum effect?

Performance measurement can help organization improve performance by identifying good practice and learning from others. It can also ensure that the organization is focused on its key priorities, and that areas of poor performance are questioned.

The aim of this thesis is to develop and examine a comprehensive model for museum managers for measuring the performance of public art museums based on the measuring performance tools Balanced Scorecard and Data Envelopment Analysis. Comprehensiveness in this context is defined as an assessment architecture that integrates quantitative and qualitative criteria and examines performance and accountability expectations from both an internal, functional area focus and an external, public-oriented focus.

The model proposed for this thesis is the model for the evaluation of the performance of the regional art museums. The design of the model involves the invention and application of a common rating system for museums, where sets of objectives – artistic, social, financial, externalities for instance – must be synthesized into one system of measurement. The model is intended to possess a number of attributes, the model should:

- incorporate the measurement of a wide range of strategic objectives,
- be sensitive to conflicts in the statement of strategic objectives through the use of weighting methods,
- combine elements of economy, efficiency, effectiveness and equity,

- be flexible,
- be testable.

The question of benchmarking has begun to be also important. Museum managers and directors tend to have a negative approach to the museum benchmarking. Indeed, it is very fragile field and if someone wants to do benchmarking, it has to be done very carefully and should not be overemphasized. From my point of view, the Data Envelopment Analysis (DEA) seems to be an appropriate tool to compare an art museum with its peers. That is why I decided to introduce a joint model combining Balanced Scorecard (BSC) and DEA.

1.2 Aims of the Study

The study aims at providing a comprehensive overview of the issue of performance measurement in museums. My goal is to identify and investigate existing evaluation models from a critical perspective. Based on study of existing literature and on my empirical research I aim to propose a joint model combining BSC and DEA in order to introduce a comprehensive model for art museums to monitor their performance and be able to compare themselves with peers.

Generally speaking my objectives are:

- Examine context (historical, business, mission, and operational) that influences the current managerial methods and attitudes in art museums with the focus to evaluation approach.
- Introduce the performance measurement tool as the part of strategic decision-making in public art museums.
- Propose a comprehensive model to monitor and measure performance of regional art museums.
- Examine the component parts of the suggested model for art museums to extend necessary to justify the inclusion of individual elements in the model, and examine the interrelationships and influences between the component parts.

1.3 Overview of Research Methodology and Approach

The economics of museums can be studied through two different approaches. The first concerns reducing costs and/or increasing demand, the second concerns the consideration of a museum as an economic unit governed by the rules of supply and a demand (Frey, 2006). This doctoral thesis focuses on the museums functions under both approaches.

Mixed research method has been employed in this research. Qualitative data has been obtained through the questionnaire and the interviews and analysis of strategic documents.

Quantitative data has been obtained through the questionnaire and from the annual reports of selected regional art museums.

At the beginning the relevant literature has been studied in order to develop a framework. I have drawn primarily on published literature from which critical analysis and synthesis of information has been developed.

The scope of this dissertation is constrained in several ways that leave opportunities for future research. Most importantly, I have proposed a generalized model, whereas in application, each individual art museum would adapt specifics.

1.4 Research Questions and Hypotheses

To construct performance measurement framework and model for public art museums, the following fundamental research questions have to be answered:

- **RQ1:** What is the effective performance measurement system and tools for public art museums?
- **RQ2:** How can public art museums implement the performance measurement system successfully?

To address the two fundamental questions, the following were investigated:

- **RQ3:** What are the knowledge gaps in the current literature in regard to performance measurement for public art museums?
- **RQ4:** Can management improve the museum's activities efficiency using various assessment methods?
- **RQ5:** What are the weaknesses and problems of the current management methods in museum management?
- **RQ6:** What metrics and indicators should be measured?
- **RQ7:** How can art museum managers successfully measure and manage their performance?

Hypotheses

- **H1:** Regional art museums located in the regions with the higher number of citizens are more efficient than the ones located in the regions with the lower number of citizens.
- **H2:** Regional art museums tend to be more efficient in the activities that are more visible for stakeholders.

1.5 Research Design

In this study, a research design of a mixed methodology has been employed. I have combined aspects of the qualitative and quantitative research at a lot of methodological steps (Creswell, 2013). The big plus of this approach is that it takes advantages from both the qualitative and quantitative paradigms and therefore reduces the limitations that are linked with a single methodological design (Byrman, 1996). In order to organize the research, a concurrent triangulation strategy has been used. The advantage of this strategy is that it allows researcher to use two different methods at the same time independently to each other. In order to collect data, the methods of semi-structured interviews, structured-questionnaires survey, and document analysis were employed.

1.5.1 Qualitative Research

The qualitative research has bigger importance within this study, since it serves as the basic for developing the model based on the BSC architecture. Qualitative research started with an extensive review of existing literature and analysis of existing performance measurement theories in museums, models, and methods with the aim to identify the strengths and weaknesses of each model and method. Also as part of a qualitative research 16 interviews were conducted and a questionnaire survey was send also to 14 governing bodies and 10 of them replied.

1.5.2 Quantitative Research

Quantitative research has been based on a structured questionnaire survey sent to selected museums and also quantitative data was obtained from annual reports and from the statistical reports. To analyze quantitative data, DEA approach was employed.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter is focused on the analysis of the current literature related to the topic of performance measurement in museums and other cultural organizations. Cultural institutions, and in particular museums, have only recently been a subject of study for economists. The milestone in museum economics research was the conference “*Economics of Museums*” held at the Durham University in March 1998. Since then we can register an increasing interest in studying the economic implication of the activity of museums (Johnson and Thomas, 1998)

2.1 Museum Performance Measurement Studies

The topic of performance measurement in museums has been already examined, especially in Western European countries. Although, it is a relatively new issue in the Czech environment. To my knowledge, there has been conducted only one PhD thesis¹ focused on the topic of museum performance measurement. This doctoral thesis tends to observe only museum performance indicators and does not examine DEA and BSC. There are several reasons for the lack of performance measurement studies in cultural sector in the Czech Republic, one of them is the fact, that it requires data that are not easily available.

One of the very first attempts to measure the performance of a group of museums was undertaken by the British Audit Commission (1991), which proposed a series of performance indicators for the analysis of museum subsidized by local government. But the collection and interpretation of these indicators seemed to be difficult, and only a few institutions used them. Later the British Department of Cultural Media and Sport decide to provide a new study in 1999, which centered on efficiency and effectiveness of museums and galleries, there were 365 indicators in this study in order to measure the performance of various museum activities. First book mainly focused on measuring museum performance and museum impact has been published recently. Its author is John W. Jacobsen and it is called *Measuring Museum Impact and Performance Theory and Practice*. This book explains the value of museum, look at the methods and different approach of performance measurement. But from my point of view, the author did not include some important aspects of this field such as BSC and DEA.

¹ The thesis was written by Michal Šulc and was defended in 2014 at University of South Bohemia in České Budějovice

Several studies dedicated to the topic of performance measurement in museums have been already conducted. Generally, these studies can be divided into two groups. First group of studies is focused on monitoring and measuring museum's performance with a set of indicators. This group includes studies by Ames (1990), Jackson (1991) and Weil (1995), Anderson (2004), Zorloni (2010). Also, part of this group are studies exploring the implementation of the BSC into museum management, these have been done by Fox (2006), Weinstein and Bukovinsky (2009) and Zorloni (2012). The main goal of these studies is to select a group of indicators or ratios that would enable comparisons and that would monitor museum's performance during the time. I do not consider this method convenient for a comparison between several museums, since each museum is really specific. However I do consider this method convenient for the internal comparison within an organization itself. As Herrero (2013) points out this first group of studies admit that set of indicators can never offer an all-inclusive and fully comprehensive description of how cultural institutions function. The second group of studies aims to provide a specific production function and therefore measure the efficiency of certain number of decision making units by using frontier techniques. These studies allow to compare the set of decision making units, since it provides a straightforward indicator. Studies using this methodology are listed in the Table 1. One of the most comprehensive approaches was conducted by Mairesse and Eeckaut (2002). In their study they used three service models (conservation, communication, and impact) and outputs corresponding to those activities for the evaluation of museums. Basso and Funari (2004) used this non-parametrical method using two inputs (work and size of exhibition rooms), and four outputs (visitors paying the full admission fee and a reduced admission fee, number of temporary exhibitions and other related activities). Del Barrio et. al (2009) used also a complex production function with three inputs (employment, size and museum facilities) and four outputs (visitors, temporary exhibitions, the museum's social impact, and the impact of the art collection). Generally speaking, we can say, that the second group is more flexible, because these studies consist of mathematical optimization process using empirical data on combinations of factors that generate a number of outputs (del Barrio and Herrero, 2014).

The first attempt to implement BSC-DEA model was conducted by Rouse et al. (2002) and Rickards (2003), who applied this model to the aircraft maintenance and construction materials. So far there has been one research using BSC-DEA approach for museum activities evaluation, conducted by Basso et. al (2015). Non-parametric models such as DEA are usually used to measure the relative efficiency of decision making units and have often been used to assess public service (del Barrio, 2009).

Together with the literature that supports performance measurement in museums, there have been several studies examining this topic from very critical point of view. This approach is investigated in the separate chapter.

The following Table shows the studies which have been conducted so far, the table consists only of studies belonging to the second group of literature review. We can see, that most of them have been examined the museum activities in Europe, also there is no evidence, that output or input oriented model would be preferred.

Table 1 List of Museum Performance Measurement Studies

Authors	Title	Sample	Variables	Method
Mairesse and Eeckau (2002)	Museum Assessment and FDH Technology: Towards a Global Approach	64 museums in Belgium	<u>Preservation model</u> Input variable: operational budget Output variable: percentage of the collection that has been inventoried <u>Research and Communication model</u> Input variable: operational budget Output variables: number of temporary exhibitions, number of publications, number of communication actions <u>Impact model</u> Input variable: operational budget Output variable: number of opening hours, number of visitors	Free Disposal Hull
Basso and Funari (2003)	Measuring the Performance of Museums: classical and FDH DEA models	15 public museums in Italy	Input variables: number of workers, exhibition area Output variables: number of visitors paying the full price, number of visitors paying either a reduce or a special price, number of temporary exhibitions, number of other activities carried out by the museum	DEA CCR and BCC model and Free Disposal Hull

Basso and Funari (2004)	A Quantitative Approach to Evaluate the Relative Efficiency of Museums	15 public museums in Italy	Input variables: number of workers, exhibition area Outputs variables: number of visitors paying the full price, number of visitors paying either a reduce or a special price, number of temporary exhibition, number of other activities carried out by the museum (including seminars, conferences, research and so on)	DEA - CCR input-oriented model
Barrio et. al (2009)	Measuring the efficiency of heritage institutions: A case study of a regional system of museums in Spain	Regional system of museums in Spain (224 museums)	Input variables: staff, area of exhibitions, number or divisions and area of the museum, index of equipments and facilities of the museum, open hours, entry price Output variables: number of visitors, index of impact of activities and collections	DEA input-oriented model
Haruna et. al (2011)	Evaluation of Middle and Long Term Management Efficiency of Public Museums by Network DEA	49 museums in Japan	Input variables: square measures, number of collection, number of staff, a curator's rata, access distance, ambient population, exchange population, expense, store items purchase cost, education spread cost, maintenance repair cost Outputs variables: short term income, number of outside activity, number of users, long term income	DEA - CCR output oriented model

Taheri and Ansari (2013)	Measuring the relative efficiency of cultural-historical museums in Tehran: DEA approach	19 cultural-historical museums in Tehran	Inputs variables: space & accessibility index, human resource index, facility index, introduction index Output variable: visitors index	DEA - CCR output oriented model
Herrero (2013)	Is Museum Performance Affected By Location And Institution Type? Measuring Cultural Institution Efficiency Through Non-Parametric Techniques	23 museums in Spain	Input variables: employment, equipment Output variables: temporary exhibitions, social impact, impact of collection	DEA CCR and BCC model
Carvalho et. al (2014)	The Economic Performance of Portuguese Museums	285 museum in Portugal	Inputs variables: rate of efficiency (visitors), number of collaborators, number of open days, index of facilities Output variable: number of visitors	
Basso et al. (2015)	How well is the museum performing? A joint use of data envelopment analysis (DEA) and balanced scorecard (BSC) to measure the performance of museums	11 municipal museums in Venice	<u>Customer Perspective</u> Inputs variable: insured value Outputs variables: visitors, website visitors per day, members <u>Internal process perspective</u> Input variable: total costs Output variables: conservation and restoration costs, visitors <u>Innovation and learning perspective</u> Input variable: costant Output variables: aggreage sustainability indicator, personned training <u>Financial perspective</u> Input variable: expenditure Output variable: income	BSC-DEA approach

Source: Mairesse and Eeckau (2002), Basso and Funari (2003), Basso and Funari (2004), Barrio et. al (2009), Haruna et. al (2011), Taheri and Ansari (2013), Herrero (2013), Carvalho et. al. (2014), Basso et al. (2015)

2.2 Performance Measurement from a Critical Point of View

Undoubtedly, performance measurement has many benefits to offer, but there are also several pitfalls and problems that those who use performance indicators need to be aware of (Jackson, 1991). Therefore, performance measurement in museums has been also subject of criticism. Many scholars and museum professionals see the endeavor to assess museum activities and rank museums a pointless and even damaging for museums. It is true that performance measurement in museum is very controversial and should be implemented with extreme caution. The most common objection against performance measurement in museums is the measurement of quality. How do you want to measure the quality of collection, exhibition, museum activities, etc.? What kind of indicators should museum monitor? Are these indicators able to tell us something meaningful about a museum?

From my point of view, performance measurement in museums is a good tool how to improve museum's funding, decision-making, budgeting and other activities. But on the other hand, performance measurement should not be overemphasized and we should always ask ourselves the question: "*Is performance measurement way how to gain a lot or is it waste of resources?*" In other words, when creating models to measure performance of museums, we must keep in our mind that measurement must not be more expensive than what it is supposed to bring.

In the last decades we have witnessed a huge expansion of evaluation studies and impact studies within the cultural economics. These studies tend to calculate an economic impact of cultural institutions and justify their existence. But why we do so? The answer seems to be simple, policy makers and government admire these studies and tend to judge quality of cultural institution based on its economic impact. I consider this tendency extremely dangerous. Nowadays, we try to judge everything from an economical point of view. Our society tends to focus only on things that is possible to measure, without considering unmeasurable aspects. We have indicated the huge expansion of audit almost in all spheres of our lives (Power, 1994). Somehow, we tend to forget what is the main purpose of cultural institutions, and in particular museums. The aim of a museum should not be to create economic impact on a local economy. The fact that a museum has this impact has been proved, but should not be used for ranking of museums or for assessing museum's activities.

More than three decades ago, Mintzberg (1975) observed that many managerial tasks involve judgment rather than formal analysis. Managers therefore prefer rapid, informal and

speculative information to entirely accurate information. Allegedly, in Albert Einstein's office at Princeton University there hung a sign stating that '*Not everything that counts can be counted, and not everything that can be counted counts*'(MacDowall, 2015, p.11). Performance measurement adepts sometimes forget about this insight. Managers and politicians inferred from the conviction that *what gets measured, gets done* that *what does not get measured, does not get done*. This incorrect logical inference was reinforced by management consultants advocating the quest for the ultimate set of key performance indicators (KPIs) (see for instance Kaplan & Norton, 1996, on the BSC). Many employees inferred that services not subjected to a KPI are not that important. Divisions in large organizations often lobby to get their activities into the KPI set. They know that what is counted, counts.

We know that what is measured gets attention, but we also know that many important dimensions are immeasurable. A key issue thus is how to cope with the uncountable in performance management systems.

There is increasing awareness that public organizations cannot be effective on their own. Actors from all spheres – the executive, legislature, the citizen and the administration – are expected to share responsibilities.

Some time ago, Innes (1990) observed that the only way to keep data-gathering out of politics is to collect irrelevant data. Performance management, including the use of performance information for policymaking, has to be political. Good performance information should strengthen the evidence base for solving political problems of who gets what, when and how (Lasswell, 1936). Such issues are relevant from micro to macro levels: in government-wide policymaking, in policy sectors and networks, in organizational management and in micro-management. We thus do not imply that the political institutions (ministers, parliament, parties...) have to interfere with all performance issues at all levels. Rather, the political nature of performance management needs to be recognized.

Another problem related to the performance measurement is the use of inappropriate performance measures. This carries a big risk, first of all, the data used for evaluation could be manipulated, or there is the risk that museum staff would focus more on obtaining performance measures and not so much on the quality of the museum services that are not measured (Paulus, 2003).

The problem already mentioned above is related to ranking of museums. At the heart of this problem is a question, whether it is possible to recommend a range of performance indicators

for any arts sector which could be used to make meaningful comparisons between institutions (Chong, 2009). There is the opinion that performance indicators must always be specific to a particular institution and should never be based on some hypothetical benchmark or standard applicable to all museums or even to museums of a specific discipline, scale, or type of governance (Chong, 2009). There are several reasons why a museum A might have to spend much more money than museum B, for example, a long established museum service is likely to have a huge collection, and it is also likely to have inherited quite a few listed buildings, so as a consequence it is likely to have enormous expenses, although it might not have a huge amount of visitors. Another museum might have much more visitors, but the museum itself might only be ten years old and it might be in purpose-built building without all of those mentioned building expenses. Since the museum service is discretionary, they are all extremely different (Selwood, 1999). Accepting this assumption would mean, that it is impossible to define universal model of best practice. In my thesis I aim at providing a comprehensive model, but this model has to be flexible in order museums could adopt it to their management and activities.

Last but not least possible problem is the number of performance indicators. Too many indicators could be unmanageable for museum staff and too little indicators would not give a comprehensive vision of a museum. Unfortunately, there is no easy answer how many indicators are required. Museum managers must judge how many indicators are manageable and also what is the value of information gained from these indicators, and how much does it cost to produce and monitor the indicators (Jackson, 1991).

2.3 Current Situation

As we can see in the previous chapters, performance measurement has received much attention in recent years. We can find the beginning of this movement in the UK. The requirement to evaluate performance in the public funded cultural sector in the UK has become increasingly pressing since the Conservative government's Financial Management Initiative of 1982, which called for greater efficiency, effectiveness and "value for money" at central and local government (Selwood, 1999). These demands were largely implemented through the Audit Commission and the National Audit Office. In 1991 the Museum Association² in the UK suggested that performance measurement was a major issue in the museum sector and therefore published guidelines on performance management.

² The Museum Association is the oldest museum association in the world, founded in 1889.

Originally, performance measurement systems were focused on financial metrics. In the 1990s both practitioners and academics began to question the relevance of using solely financial performance indicators. The main argument that raised against using only financial indicators was that non-financial indicators are better indicators of managerial effort and are less subject to manipulation, since they are directly related to firm's long-term strategy (Turbide and Laurin, 2009). This is crucial especially for non-profit and artistic and cultural organizations, since they should pay more attention on the quality of their activities or customer satisfaction than financial metrics.

The root of the problem, not only in the Czech Republic, is the fact, that there is not agreed upon method to assess museum activity. Therefore the first effort should be made in order to give museum leaders the tools to measure their outcomes. Also, as Anderson (2004) points out, the difficulty in measuring success in art museums today stems in part from the fact, that over the last generation, most of the art museums have shifted their focus away from collection-building and towards various kinds of attention to the public, without balancing these two imperatives and without consensus on what constitutes best practice. Museums are pushed nowadays to have the best exhibitions which would attract huge amount of visitors and the consequences of this pressure is that not so much attention is paid to the education and collection-building, which is paradox and against the origin of museums. Big blockbuster exhibitions are newsworthy and that is the reason, why museum funders like them, but they do not ask themselves, what is the social and educational impact of these exhibitions?

Find a way how to measure museum performance is an important task, since we have witnessed a downward trend in arts funding and at the same time freshly expanded facilities are required. Funders of museums demand proofs that their past support has been efficiently used and also that a museum is sustainable. But without generally accepted methods and metrics, museums will have more and more troubles proving their existence. We can disagree that museums have to justify their existence, but current situation requires it, and from my point of view, it is better to be prepared than to resist.

In recent years, we can see the rise of the studies that tend to find a new models and techniques how to determine, monitor, measure and judge museum performance. Scholars and practitioners try to take tools from commercial sector, and adapt them to the museum activities. They tend to introduce more and more complex formulas and software to evaluate museums and rank them. The question is, whether this is the right way, whether we should

maybe focus more on the basic of museums and try to invent a system that would be familiar for the museum professionals and quite easy to use and it is purpose of my research.

2.4 Museum Sector in the Czech Republic and Current Situation

The development of museums on the territory of today's Czech Republic started at the end of the 18th and beginning of the 19th century. The first officially recognised museum in our lands is the Silesian Museum founded in 1814. Other important museums, the Moravian Museum and the National Museum in Prague, were founded in 1817 and 1818 respectively.

Museum sector has undergone significant changes in the last two decades. Since 1990s, there has been an ongoing reform within the public sector related to a change of territorial organization of the state, and with a launch of new subjects providing public services. There were seven administrative regions until 1999, today there are fourteen autonomous regions. As a part of this reform, the following hypothesis was accepted, that in each region will be at least one history museum and one art museum (Fialová, 2003). Until 2001, the majority of local authority museums were run directly by the Ministry of Culture of the Czech Republic, funded by state subsidy. Since 2001, local museums have been experiencing crucial changes in terms of organization, function and status, largely in response to a changing external environment. These regional art museums with their own art collections, are the subject of this thesis.

With the reform of public service, the standards have been questioned, precisely speaking standards of accessibility and quality of services. Šebek (2001) points out that the introduction of quantitative and qualitative indicators based on algorithm are not a suitable solution for Czech museums. He proposes to create a separate act that would address the question of accreditation system of Czech museums. He suggests that this act would consist of description of criteria, the fundamental criteria being if an institution meets the requirement of the Act 122/200 Coll. *O ochraně sbírek muzejní povahy* (*On the protection of museum collections*). Unfortunately so far, such system has not been implemented, not even created. The document *Koncepce rozvoje muzejnictví v České republice v letech 2015-2020* (*The Concept of Development of Museums in the Czech Republic between 2015 and 2020*) published by the Ministry of Culture aims to introduce a system of accreditation of museums in the Czech Republic. However, the criteria for accreditation, and system of accreditation are not determined within the document. More information about accreditation systems in different countries and their possible implementation can be found in the publication *Profesní*

a etické standardy a výkonnostní ukazatele muzejní práce (Professional and Ethical Standards and Performance Indicators of Museum's Work) by Dagmar Fialova in 2003.

Chyba! Chybný odkaz na záložku. illustrates the evaluation of museums in the Czech Republic divided into fourteen regions in the years 2012, 2013 and 2014. The data for the year 2015 has not been published in the time of writing this thesis. We can see that during the said years the number of museums was quite stable. It is necessary to stress that some museums included in the table are temporary out of order, but they make up only 2 – 2.9%. Important information is also the fact that 23.9%, that is 117 museums (as of 31.12.2014) have more than one branch. The total number of all branches of all museums is 872 (NIPOS, 2015).

Table 2 Number of Museums in Each Region in the Czech Republic

Region	Number of Museums in 2012	Number of Museums in 2013	Number of Museums in 2014
Prague	38	37	37
Central Bohemia Region	72	74	74
South Bohemia Region	39	41	41
Pilsen Region	35	36	36
Karlovy Vary Region	12	12	12
Usti Region	27	28	28
Liberec Region	27	27	27
Hradec Kralove Region	46	47	47
Pardubice Region	33	35	35
Vysocina Region	36	36	36
South Moravia Region	41	41	41
Olomouc Region	20	18	18
Zlin region	24	24	24
Moravian-Silesian Region	32	33	33
TOTAL	482	489	489

Source: NIPOS (2015)

Figure 1 Map of the Czech Republic with 14 Regions



Source: <http://www.jihovychod.cz/en/rop-south-east/south-east-cohesion-region>

Table 3 shows the number of museum according to specialization. As we can see, there are 52 art museums, which represents only 10.8% of all museums in the Czech Republic. This number includes art museums run by the Ministry of Culture, regional governances and municipalities. Typically, Czech museums heavily rely upon public funding.

Table 3 Number of Museums in 2014 Classified by Specializations

Type of Museums	The Number of Museums in 2014	Expressed in %
Art museums	52	10,8
Other art disciplines museums	21	4,3
Archeology and history museums	25	5,1
Natural history museums	3	0,6
Science museums	38	7,8
Ethnography museums	12	2,5
General museums	232	47,7
Open air museums	4	0,8
Others	99	20,4

Source: NIPOS (2015)

To my knowledge, most of museums in the Czech Republic, with the exception of quantifiers such as annual attendance, budget and staff size, the museum field lacks a common evaluation system. It is necessary to reach some consensus in museum community on which areas of a museum's performance are of significant interest. Once the categories are set, performance indicators in each of these areas should be determined (Ames, 1990). Naturally, individual museums should be encourage to formulate reports on their own performance. However, to reach the consensus, there is an absolute need for involvement of the museum community.

2.5 Public Art Museums from an Economic Point of View

2.5.1 Introduction

As part of my thesis, I find important to implement the chapter that observes art museums from an economical perspective and explains some specifics typical for art museums. Notion knowledge of museum economy is crucial for the observation of performance measurement in museums.

Scientific museum research has traditionally been approached form the sociologist's point of view, with the strong focus on the behavior of the visiting population and its structure in terms of class, age, sex, education level, etc. However, the economist's contribution to museum research is not limited only to financial problems ant their analysis. It is rather a particular way of approaching problems and analyzing them that focuses on the individual and his behavior in situations in which he is faced with a choice to made (Pommerehne and Frey, 1980).

Art museums are nowadays more important than ever before, they play a substantial role in people's leisure activities and belong to one of the most important tourist attractions. Substantial amounts of money are spent when visiting museums both in terms of entry fees and expenditures in museum restaurant and shops. The visitors have the strong effect on local economics, especially in touristic locations. (Frey and Meier, 2006)

Traditionally, European museums have been public, even forming part of the normal government administration and therefore they have received public funding.

Art museums preserve and present the artistic elements of the cultural heritage. All museums face questions of how to allocate resources among their multiple functions, how to manage their investment portfolios, and how to pay for it all. Museum managers wrestle constantly with what prices to charge for gallery excluding anyone by imposing an admission fee (Heibrun and Gray, 2004).

The term Economics of Museums may be understood in two different ways:

1. Museums may be looked at as an economic unit, or a firm providing certain services, one then analyses the relationship between the input (exhibits, manpower, etc.) and output in terms of revenue gained, moreover, the effect of museums on the economy is analyzed, for instance how much employment and what value added is created in other sector.
2. The second understanding of the term is the economic approach of thinking is applied to the case of museums: individuals are assumed to pursue their utility within the constraints

imposed by institutions and environment, especially the scarce resources. This methodology has been applied to many different areas, such as to politics, law, history, sports, or religion. The economics of museums thus clearly distinguishes itself from other approaches to studying museums, in particular the sociology of museums or the art historic points of view (Frey and Meier, 2006).

A central concern of economic analysis is the efficiency with which resources (land, labor, capital and management) are allocated to different uses. This concern derives from the scarcity of resources: resources that are allocated to museum activities cannot be utilized elsewhere in the economy. Choices therefore have to be made. The same problem of scarcity also arises in the allocation of resources between museums and between functions and activities within museums (Johnson and Thomas, 2000, p. 5).

The efficiency of resource allocation can only be assessed within the context of given policy objectives. It is not the task of economic analysis to say which objectives should be chosen, thus such analysis is relevant in the museum field whether the underlying objective is for example, the maximization of the general welfare of the population, museum profits, exchequer gains, visitor number or scholarly output. Economic is not therefore synonymous with commercial or profit-making. Economic analysis may also show how different objectives may be achieved through various strategies, thereby offering the policymaker a menu of objectives from which to choose. In this way, the analysis may sometimes have an important clarifying role. In addition, it may be provided some guidance on the trade-offs that may exist between policy objectives. (Johnson and Thomas, 2000, p. 5)

2.5.2 Museum Output

As in any other institution, museums use their resources to produce outputs, before the discussion about resource allocation we need to define museum outputs.

Johnson and Thomas (2000) distinguish intermediate and final outputs. Logically intermediate output later becomes an input into another productive process. We can label as intermediate output for example the provision of collections and documentation, which serve as a resource base for researchers. The service of running a repository for the nation's treasure can be also regarded as intermediate output, since the treasure should be used as a basis for research or exhibition

Final output can be usually divided into another two types. The first type is the result of scholarship (research), this can be publications, lectures and exhibitions. Big national museums are more active in producing this type of final output than small local museum.

Usually the principal users of scholarly output are other scholars. The second type of final output is really important for museums, it is the experience enjoyed by the general public when they make a visit.

Various art museums can have various distributions of resources across the production of the two types of outputs. Usually, big national museums produce more scholarly oriented outputs.

2.5.2.1 Final Output

The deeper analysis of the two types of final outputs is described in the following part of the thesis. Firstly, we look at the scholarly output.

Scholarly output

This type of output has some economic characteristics that are worth to mention. First of all, scholarly output has elements of a public good, in the sense that there is non-rivalry in consumption. In other words, if there is one person who consume research findings, it does not exclude another person from consumption of those same findings. And the second characteristic is non-excludability, this fact is a direct consequence of the fact that research results are likely to be in the public domain. Therefore, no person can be excluded from consuming them once they are produced. After we characterized these two public good characteristics, we can say that scholarly output of museums is unlikely to be supplied to the optimal extend through a private market system and this is the one of arguments, why museums should receive public support (Johnson and Thomas, 2000)

The visitor experience

The experience that a visitor has from the visit of a museum depends on combination of many aspects such as museum services (including also catering, toilet facilities, etc.), exhibitions, but also visitor's participation. This experience is not limited to the time spent at the museum, because subsequent memories of a visit may extend the period over which the experience is enjoyed.

Spillover

Output of scholar type can generate spillover benefit or positive externalities, which is benefits which do not accrue to the purchaser of scholarly output. Let us look at the example, a teacher reads a book or article that is result of research in a museum and after transfer this gained knowledge to his/her students. So again, someone who has made a visit to a museum may generate greater knowledge and appreciation of the past in others (Johnson and Thomas, 2000).

Speaking about positive externalities, it is worth to mention also economic benefits: visitors of a museum may have effect on local economy, since they generate a wide range of spin-off benefits.

2.5.2.2 Consumers of Museum Outputs

The consumers of museum outputs are general audience, scholars, experts (art historians, curators, museologists, etc.), school groups and teachers. Considering the assumption that a museum has positive externalities we can say that the consumers of museum outputs are also persons who do not visit a museum.

The difference between scholarly output and visitor experience is that scholarly output today remains available for subsequent generations. We cannot say the same about visitor experience. There may be a trade-off between providing an experience for the current generation's visitor and serving those from subsequent generation. Another example of trade-off may occur where resources are put into acquisition activities in order to preserve the option for future generations to view their past. At the moment that items for collection become available, museum staff may not know whether there is likely to be any demand in the future to view such objects. However in case they are not collected they may be lost forever (Johnson and Thomas, 2000).

2.5.3 Demand for Museums

Frey and Meier (2006) distinguish two types of demand for museums. The first is the private demand extended by the visitors (these may be persons interested in the exhibits as a leisure activity or as part of their profession as an art dealer or art historian. We call this demand the private demand. Johnson and Thomas (2000) say that this is demand for scholarly output and the visitor experience and calls it market demand.

The second type of demand comes from persons and organizations benefiting from a museum. This demand is called the social demand and it is based on external effects and/or effects on economic activity. First, I introduce the private demand.

2.5.3.1 Private demand

As described above, we can divide the final museum output into two parts: scholarly outputs and visitor experience. Therefore, we can apply the same principle to the demand for a museum and distinguish private demand for scholarly output and private demand for visitor experience.

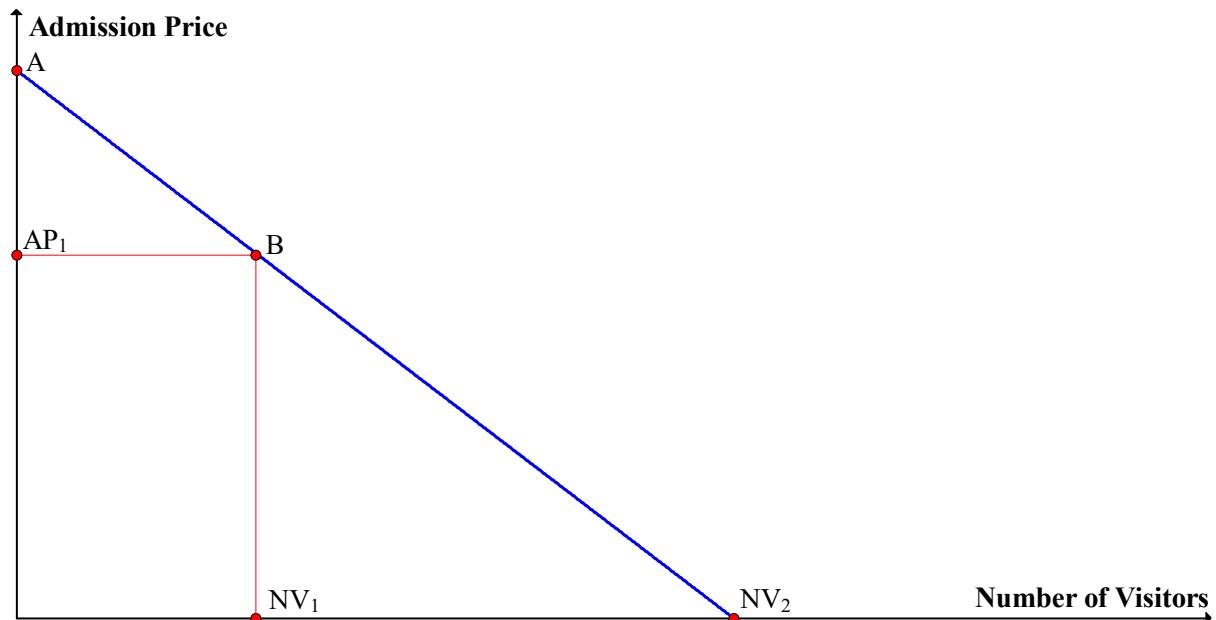
Demand for scholarly output

We can find many ways in which private individuals and institutions may directly express their demand for the scholarly output of a museum. First of all, they can buy museum publications, second, they may purchase its research, advisory or consultancy services. Third, a museum may receive bequests and donations. Forth, individuals and businesses may provide sponsorship for scholarly activities. This kind of sponsorship will often be given with an eye more to the publicity that is generated than to the research results that are made possible, for example the sponsor buys a type of output which is different from that whose production is being financed, in this case publicity and scholarly output are joint products.

Demand for the visitor experience

Generally, it is possible to construct a visitor demand schedule that is illustrated in the Figure 2. The curve ANV_2 expresses the relationship between the admission price and the number of visitors, holding all other factors constant. The shape and position of the curve are determined by a number of factors such as tastes, income and the availability and price of substitutes. In this case I have depicted it as linear. The curve has downward sloping to the right, since the number of visitors tends to increase as the admission price falls. If admission was at the level of AP_1 , the number of visitors would be NV_1 . If admission was zero, then NV_2 number of visitors would be attracted to the museum. Here it is important to mention that the demand curve in Figure 2 is based on the assumption that the quality of the visitor experience is constant, it means, for example, that it abstracts from the possibility that the number of visitors will influence the experience received.

Figure 2 Museum Demand



Source: Johnson and Thomas (2000)

By far the largest number of museums visits can be attributed to leisure time activity. As it is explained above, the number of visits can be analyzed by a traditional demand function, capturing the major factors determining the rate of visits per time period. Its characteristics can be determined by maximizing individual utility functions subject to budget and time constraints. Its features can be empirically measured by using the data on museum visits and the factor included in the demand function, normally by a multiple regression analysis. There are three major determinants relating to prices or costs (Frey and Meier, 2006):

1. **Entrance fee.** Together with the number of visits, it determines the respective revenue gained. The price elasticity indicates by how many percent the number of visitors decreases when the entrance fee is raised by a given percentage. Econometric estimates for a large number of different museums in different countries suggest that the demand for museum services is price inelastic.
2. **Opportunity cost of time.** It indicates what alternatives visitors have to forgo when they visit a museum. In order to measure the monetary value, one must identify how much additional income could have been gained during that period. For persons with high income, potential and variable time use, mostly the self-employed, the opportunity cost of time are higher than for people of low income and fixed working hours. The latter are therefore expected to visit museums more often, all other things being equal. The opportunity cost of a museum visit not only depends on the time actually spent in a museum, but also on how much time is required to get to the museum.
3. **Price of alternative activities.** These are substitute leisure activities, such as other cultural events like theater, cinema, sport, dinning out in restaurant, time spend with friends at home etc. Even within the industry, museums may constitute a substitute for other museums. The higher the price of such alternatives is, the higher museum attendance is. But complements also systematically influence the number of museum visits.

Income is another classical determinant of the demand for museum visits. Econometric estimates reveal an income elasticity demand.

There are many other determinants that must be included in a well-specified museum demand function – one is of course the quality of the collection or special exhibition. A final determinant of the rate of museum visits are individual preferences, they are difficult to measure independently.

2.5.3.2 Social Demand

As it is said in the previous chapters, museums produce effects on people not actually visiting the museum, these benefits cannot be captured by the museums in terms of revenue, in this case we speak again about external effects. Museums create social value, for which they are not compensated in monetary terms. Frey and Maier (2006) distinguish five types of external effects:

1. **Option value** – people value the possibility of enjoying the objects exhibited in a museum sometime in the future.
2. **Existence value** – people benefit from knowing that a museum exists but do not visit it themselves now or in the future.
3. **Bequest value** – people derive satisfaction from the knowledge that their descendants and other members of the community will in future be able to enjoy a museum if they choose to do so.
4. **Prestige value** – people derive utility from knowing that a museum is cherished by persons living outside their community.
5. **Education value** – people are aware that a museum contributes to their own or to other people's sense of culture and therefore value it.

Museum may also produce negative external effects, whose costs are carried by other persons. An example would be the congestion and noise museum visitors inflict on a community. The non-user benefits and cost have been empirically measured by using three different techniques:

- representative survey of both visitors and non-visitors of a museum,
- revealed behavior of individuals,
- to analyze the outcome of popular referenda on expenditures for museums.

Museums produce monetary value for other economic actors, they create additional jobs and commercial revenue, particularly in the tourist and restaurant business. These expenditures create further expenditures – multiplier effect results. But the museum's task is not to stimulate the economy.

It has long been acknowledged by economists that the private demand reflected in ANV₂ in Figure 2 may not always be an accurate reflection of the wider social demand for the benefits of museums. Some elements which may not be captured in private demand are briefly considered below.

Option demand

This demand is most relevant in terms of the visitor experience. Some people are willing to pay just for the option of visiting a museum at some point in the future, even if they do not have a need and passion to visit a museum now. Those individuals place an option value on the visitor experience. We can extend this argument to the example, where some people want to preserve the possibility that other members of society can visit a museum. The option of visitor experience has a public good element, so it means that if the option is provided for one, then it is provided for others, of course only up to capacity limits. Consequently there is non-rivalry in consumption. There might be also some individuals who have an option demand and decide to visit the museum not for joy of visiting the museum, but in order to make some contribution through admission fee. Of course, there are some alternatives to this approach, those individuals can donate or volunteer for museum (Johnson and Thomas, 2000).

Demand by future generations

If the demands of future generations both for scholarly output and visitor experience are to be met, we have to consider the demand in current generation, for example, to ensure that artifacts are collected and preserved. In this case it might be necessary for government to buy more current museum output to ensure provision for future generation, or it may be registered by private individuals (Johnson and Thomas, 2000).

2.5.4 Cost structure

This part is focused on crucial aspect of economic analysis of museums, the structure of cost. This will provide the background needed for discussion of the contentious question of museum entrance fee.

For museums is characteristic that they have very high fixed costs and low variable costs, which has consequences a diminishing average cost curve. Then, the margin cost of a visitor is close to zero. That is the reason, why efficient pricing close to marginal cost never covers the cost involved. The costs of museum have a dynamic component which is disadvantageous for the enterprises, due to the productivity lag, museums face constantly increasing cost over time (Frey and Meier, 2006).

Interesting part of the museum costs are the opportunity cost. The exhibitions of a museum generate high opportunity cost, but museums usually do not take them into account.

High fixed costs are costs for maintaining buildings, collections, pay staff, insurance, technical outfits etc. These cannot be varied in the short run. There is also interesting relationship between the art market and fixed museum costs, in particular the cost for the

acquisition of artworks. When the prices of artworks on the art market increase, then it is more expensive for museums to purchase them and also, the insurance fee increase as the prices of artworks increase, since the monetary value of these artworks increase.

Of course, the high fixed costs have consequences for the structure of the museum organization and also the pricing of the services they produce. Variable costs vary with the output produced and represent a relatively low fraction of the total costs therefore museums face decreasing unit costs.

As mentioned above, marginal costs are close to zero and constitute crucial economic information. They tell us how costs vary with outputs. So, in other words, the cost of an additional visitor is most of the time close to zero. Let us look at the example. A museum sets up the exhibition, then the basic operating costs are for opening the museum on the particular day, when more people enter the museum, the fixed component can be divided by an ever increasing quantity. That is the reason why average costs decrease. Then this decreasing average cost curve has consequences for the production of the museum service. But, it is necessary to mention, that there are situations, when margin costs are not zero, for example in case of blockbuster exhibition, an additional visitor may impose congestion costs. Maddison and Foster (2003) conducted analysis of the congestion costs at the British Museum with the use of contingent valuation techniques and they estimated that the cost imposed by the marginal visitor was £ 8.05, which seems to be exceptionally high.

In the cultural economics, there is an important theory about cost diseases, introduced by Baumol and Bowen (1966), so-called Baumol's cost disease and he observed this theory with performing art organizations. But it is argued that museums face the same economic dilemma as most cultural organizations. Museums are according to the cost disease theory, subject to a productivity lag producing constant financial problems for these organizations. Museums have also high opportunity costs, that were mention already at the beginning of this chapter. The artworks bring not only storage and preservation costs, but also opportunity costs. It is hard to determine the exact amount of these costs, the way, how to do it would be, if museums borrowed money to buy the works of art, the annual interest, which the museum has to pay, constitutes the real cost of capital, the opportunity costs of a painting is its monetary value used in an alternative investment (Frey and Meier, 2006).

Another important information rising from the economic analysis of museums is how costs vary with output and input, this is also significant for the performance measurement. One of few museum costs function was estimated by Jackson (1988). He focused on various activities

of museums and analyzed their influence on costs. Before analyzing the Jackson's museum production function, we look at the basic production function of museum in a graphical illustration.

Figure 3 Production Museum Function



Source: Author

Figure 3 represent the basic production model, where museum uses inputs like staff, money, equipment, etc. and in through museum activities transform these inputs into outputs like exhibitons, publications, educational programs, etc.

Back to the Jackson's production function. The most obvious output measurement is probably attendance, then we can come up with his loglinear model written as:

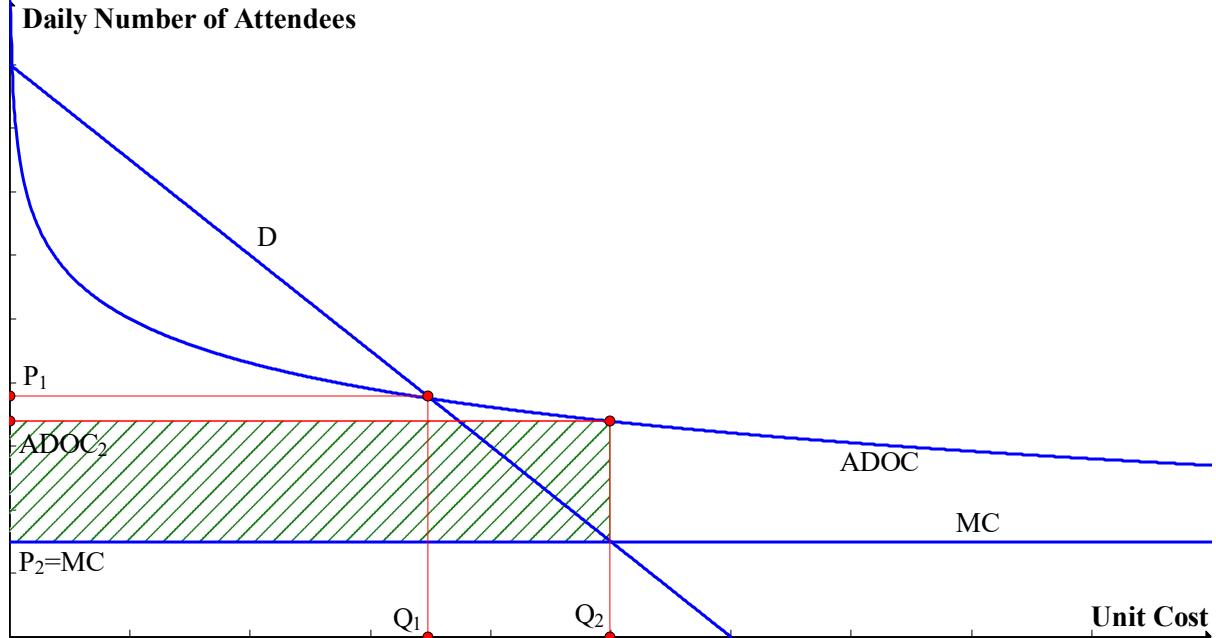
$$(1) \ln TC = \ln a + b \ln Q + y \ln W + s \ln K + r_1 EX + r_2 ED + r_3 CN + r_4 MB + r_5 AC$$

Where:

- TC = total operating cost
- Q = total attendance figure
- W = the wage rate paid per worker
- K = the cost of capital measured as the ratio of promotional expenditure such as developemtn, membership, and advertising, to contribuiions from all public and private sectors
- EX = exhibition expenses as a fraction of total operating costs
- ED = educational expenses
- CN = conservation and preservation expenses
- MB = expenses in connection with memebership activities
- AC = dummy variable equal to 1 if accredited and 0 otherwise

The last variable AC was added, because Jackson tried to capture the quality of museum by looking at which museum had been accredited with the American Association of Museum.³ But we have to keep in mind that this is only rough proxy for quality.

Figure 4 Economics of The Museum Display Function



Source: Heilbrun and Grey (1993)

The structure of the museum cost described above is depicted in the Figure 4 and so the shape of the curve is deduced from what we know about the way museums operate. It is useful to divide the costs of operating the display function into two parts. First part consists of the basic operating costs for the museums including heating, lighting, maintenance, insurance, office staff, and basic security service. These costs are the minimum costs that must be incurred if the galleries are to open every day, they are fixed and do not vary with the attendances, therefore falls as the number of visitors increases. The second part of these costs is the museum costs of additional security, information, and cleaning personnel imposed by attendees.

In the Figure 4 we assume, for the sake of simplicity, that marginal cost per visitor is constant, therefore it is shown as a horizontal line in the diagram. In the Figure 4, the basic operating cost per attendee is not shown separately, but we already know how it behaves. Since it consists of a fixed component divided by an increasing quantity, it would have the shape of a

³Accreditation system works in many countries and there are different models of accreditation with various criterias. There is no accreditation system in the Czech Republic, but according the document Museum Development Concept 2015-2020 published by Ministry of Culture in the Czech Republic, they tend to lauch also accreditation system for museums.

rectangular hyperbola, sloping downward exactly like average fixed cost. When we add this component vertically onto marginal cost, we generate the downward-sloping average daily operating cost curve ADOC captured in the diagram. Basic operating cost per visitor can be read as the vertical distance between MC and ADOC. Thus, the museum display function operates under conditions of decreasing unit cost, because as more visitors enter, the basic cost of opening the galleries to the public can be spread over more visitors. For the analysis of the effect of charging admission, the useful information is the willingness to pay for visit. In Figure 4 curve D represents the demand for visits as a function of the price charged. If the museum wished to set a price just high enough to cover the full cost of the display function, it would charge the price indicated by the intersection of the demand curve and the average daily operating cost curve, so at a price P_1 , Q_1 visitors would enter per day and the average daily operating cost would exactly equal the price charged. At output Q_1 , marginal cost is below price. Charging price P_1 therefore violates the welfare rule, which says that price should be equal to marginal cost. So there is measurable welfare loss to society in charging price P_1 , indicated by the fact that potential visitors between Q_1 and Q_2 , who are willing to pay more than the full marginal cost of their visit, but not a price as high as P_1 , are nevertheless denied attendance. But we must say, that on the other hand, if the museum followed the welfare rule, it would set price at the level indicated by the intersection of D and MC, so at price P_2 there would be Q_2 visits per day. The welfare rule would be satisfied, but because price would be below cost, the display function would incur a daily operating deficit of Q_2 ($ADOC_2 - P_2$), equal to the area of the green rectangle in Figure 4 (Heilbrun and Grey, 1993, pp. 194-196).

Analysis of the museum costs is extremely useful in primarily for any examination of the allocation of resources and also for setting the admission price and other operational activities. If visitors are charged marginal costs only, a museum will not cover its total costs, and then will have to gain deficit funding.

On the capital side, it is useful to mention that a vital proportion of the capital stock of UK museums is the result of past gifts and bequests (Peacock and Godfrey, 1974). These gifts and bequests may have positive effect on a museum's purchasing budget, it inevitably has implication for running cost, arising, from restoration and preservation.

2.5.5 Public Funding

Public funding of art museums is complex area. With the following sentences I provide just short introduction to this issue.

I already mentioned in previous chapter that private demand may not fully reflect social demand for museum service this fact is closely linked with the discussion about public funding for museums. It is necessary to mention that some of the social demands that may not be expressed in a private market system, may be reflected to same degree in range of money. On the other hand, in cases, where museum output is characterized by non-excludability, some individuals may tend to receive benefits without paying. To the extent that private demand fails to reflect the true social demand, a private market system would deliver an output level that is socially suboptimal (Johnson and Thomas, 2000, p. 30).

Although, the argument with market failure is not strong enough to justify public funding, because this failure may induce government failure, which more than offsets the gains from eliminating market failure. Johnson and Thomas (2000) stress that government failure may be taken to include failure not only in sponsoring ministries and agencies but also in museum managements. Managerial slack arising from the availability of public funding may cause government failure. The bureaucracy accompanying public funding may sometimes repress innovative behavior.

2.5.6 Resource Allocation

Before the process of judgment of how well resources are allocated, it is necessary to set up certain criteria. The problem with criteria setting is that different stakeholders want to apply different criteria. One of the criterions that is often used in economic analysis is social efficiency. Social efficiency is maximized when the excess of all the social benefits over all the social costs is maximized. There may be problem with this criterion, since it may conflict with other criteria, such as commercial considerations. Let us come back to the Figure 2 and demonstrate this situation. Museum tries to maximize its net income and sets a price of AP_1 , then we assume that at this price the museum is not able to pay its way, net income is negative. In this situation considering only pure commercial criterion, the museum should shut down, and the resources be reallocated elsewhere. But let us consider and take into account all the social benefits derived from the museum's existence, then the result would be different (Johnson and Thomas, 2000).

In the Figure 2, we can trace another conflict of criteria, museums want usually to maximize the number of visitors, but if we look at the Figure 2, the maximized number of visitors is at

NV_2 with a zero price. This situation with this price would generate a higher financial loss than a positive price.

2.5.6.1 Social Efficiency

Social efficiency is a complex concept, since it requires efficiency not only at one level, but at different levels. The first level represents the allocation of resources to museum rather than to other activities in economy, the second level consists of allocation of resources between different museum and also allocation between different museum outputs, and finally the third level questions the efficiency of mix of resources within each museum such as buildings, collections, staff, etc. At all these levels it can be shown that social efficiency will be maximized when marginal social benefit (i.e. the addition to social benefit arising from a unit increase in the relevant activity) is equal to marginal social cost (i.e. the addition to total social cost arising from a unit increase in the relevant activity). To operate at less than this level means that more could be added to asocial benefit than to social cost by expanding. This principle may be applied to questions concerning the allocation of resources to museum as a whole as well as between and within museums: socially efficient allocation implies that it is not possible to increase total net benefit by switching resources between museums or between outputs or functions within museums (Johnson and Thomas, 2000, p. 32).

2.5.7 Pricing

The issue of admission fee to museums has been a subject of many debates and has been discussed for many years, and this discussion is of course focused on public museums, in particular national museums. The questions related to the analysis of admission fee are whether charging admission fee raise or lower the resources available to museums and what is the effect of charging on social efficiency. The following discussion is valuable in case museums do not charge admission and hesitate if they should do so. In the Czech Republic, the most of public art museums charge admission.⁴

2.5.7.1 Pricing and the Museums Sector's Resources

Introduction of admission charges should raise museum's income, if we assume no consequent changes in other sources of income. Going back to the Figure 2, the price AP_1 will generate a revenue addition of AP_1BNV_10 . This amount less collection cost will be available for addition spending. Some scholars and practitioners have argued that the addition revenue from admission charges has so far been quite modest. Revenue could be increased by raising

⁴ Moravian Gallery introduced in 2013 free admission to permanent exhibitions. Some other art museums have free admission for certain group of visitors such as students, pensioners, etc.

prices still further. We have to keep in mind that in the longer run, when the shock of imposing a charge has been removed, visitor number may to some extent recover and revenue will thus be increased even if price remain constant. The question that has no clear answer remains, whether other sources of income would remain unaffected by the introduction of charges. It might happen that government would decide to reduce their funding it could discourage some sponsors and donors to support a museum. Also another effect could be decreasing number of volunteers. The number of visitors of museums could decrease, which has several consequences such as decrease of the sale of publications, decreasing of catering revenue. But to my knowledge, there has not been any study taking into account all these aspects and measuring the overall effects of charging on museum income (Johnson and Thomas, 2000).

2.5.7.2 Pricing and Social Efficiency

One of the arguments that is in favor of free admission to national museum is that they are part of the national heritage to which all should have access irrespective to ability or willingness to pay. This argument says, that everyone should be encouraged, not deterred, from visiting their national museums. Also, admission charges may be seen as a barrier that discourages people from repeating visits, which are important for a full appreciation of the collections. Let us again look at the Figure 2. The introduction of a charge of AP_1 reduces the number of visitors from NV_2 to NV_1 . If AP_1 reflects marginal social costs and if the private demand curve ANV_2 represents marginal social benefit, then NV_1 will be the socially optimal output (marginal social cost equals marginal social benefit). The visitors captured by the section BNV_2 on the demand curve value a visit at less than the social cost of provision. The visitors who are not put off by the charge receive less consumers' surplus than previously, but they could be compensated by the recipients of the proceeds of the admission charges, assuming no collection costs. There is thus no overall loss in social welfare as far as these visitors are concerned, although the distribution of that welfare has changed (Johnson and Thomas, 2000).

The argument that opponents of pricing would use is that ANV_2 do not reflect the true social demand, once merit good and spillover arguments are taken into account. They consider that people who do not visit a museum should be encouraged to do so and people who visit the museum should do so more often.

As I mention above, the introduction of admission charges may induce a reduction of visitor number in the current period, it may, in case it raises the total income available to the

museum, enhance the quality of its service or collection and thereby raise visitor number in subsequent periods. Therefore there may be a trade-off between the loss in the number of visitor in the current period and the gain in such numbers in later periods.

I have briefly examined various aspects of economics of art museums. This subject is complex and there is still a lot to examine and discover.

2.6 Performance Measurement

2.6.1 Introduction

Before the construction of the performance measurement framework and model, and examination of performance measurement specification in art museums, it is useful to define, what is the concept of performance measurement. In this chapter the definition of performance and performance measurement is examined and defined. Also, the existing performance measurement models are reviewed and compared and analyzed their strength and weaknesses.

2.6.2 Definition of Performance

Generally speaking, we can say, that performances are the outputs and outcomes of activities. We can then say that performance is the result of process, that transforms inputs into outputs and then outcomes as shown in the Figure 3, in other words, it is a result of production function. It is necessary to distinguish the performance in the private sector and in the public sector. The main difference is that in the private sector only looks at inputs, activities and outputs. This does not count for the public sector several scholars have started to redefine the existing model (Van Dooren et. al., 2015).

Figure 5 shows the most important elements of the extended production model of performance and performance measurement can cover the whole chain from input to output.

I have already mentioned the terms output and outcomes. It is crucial to distinguish between those two. Outputs represent the service provided to the public, in case of museums outputs are exhibition, publications, program, as mention in the chapter Museum Output. Outcomes then represents the actual impact and value of the service delivered, it means for example what visitors learn from the museum visit, in the other words, outcomes inform us how the service is being operated in order to achieve the strategic objectives.

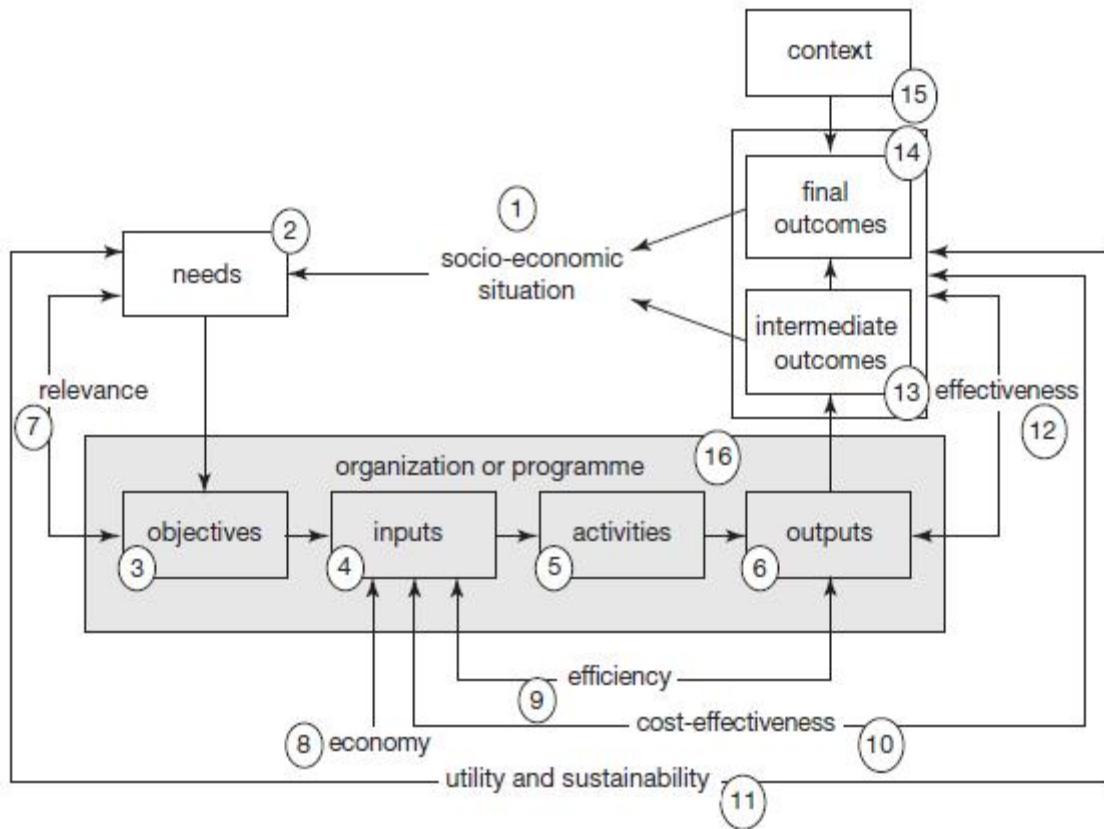
Also, for better understanding of the Figure 2, it is necessary to mention the concept of Three Es that is observed also in the following chapters. This concept consists of three fundamental elements: economy, efficiency and effectiveness. Economy is concerned with minimizing the cost of resources acquired or used. Economy is linked with acquiring human and material resources of the appropriate quality and quantity at the lowest cost. In short, economy is about spending less. Efficiency is concerned with the relationship between the output of goods, services or other results and the resources used to produce them. Efficiency represents

producing the maximum output for any given set of inputs for the required quantity and quality of service provided. In short, efficiency is about spending well. And finally effectiveness is concerned with the relationship between the intended results and the actual results of the projects programs and services, how successfully do the outputs of goods, services or other results achieve policy objectives operational goals. In short, effectiveness is about spending wisely (Jackson, 1991). (Van Dooren et. al., 2015).

Figure 5 5 is the socio-economic situation causes a need for action by the public sector. In this situation, the politicians are expected to define the social needs (step 2). Of course, not only politicians are involved in the translating issues to problems and problems to policies. Civil servants, interest group, media also play a role in formulating needs. However, the political system's unique role is to filter issues and demonstrate priorities. These priorities are translated into objectives, in the (Van Dooren et. al., 2015).

Figure 5 represented by the number 3. In order to fill up the objectives, we need inputs, such as human resources or financial resources, number 4. These inputs are to be allocated to organizations and programs in order to stage activities, as shown with the number 5 and these activities transform inputs into outputs (number 6). The confrontation of the objectives of a policy with the need allows assessing the relevance of the pursued policies (7). Economy (8) is represented by the ratio of a monetary input over another input. As described in the chapter Museum Output, we can distinguish outputs and therefore even outcomes as intermediate (13) or final (14). The final outcomes in particular are influenced by the context on which the organization or the program has a limited or no impact. The ratio of outputs over outcomes represents effectiveness (12). The ratio of the inputs over the outcomes is the cost-effectiveness (10). The outcomes of a program or an organization have to address the needs of society. The confrontation of needs and outcomes allows assessment of the sustainability and utility (11) of the program or organization (Van Dooren et. al., 2015).

Figure 5 Production Model of Performance



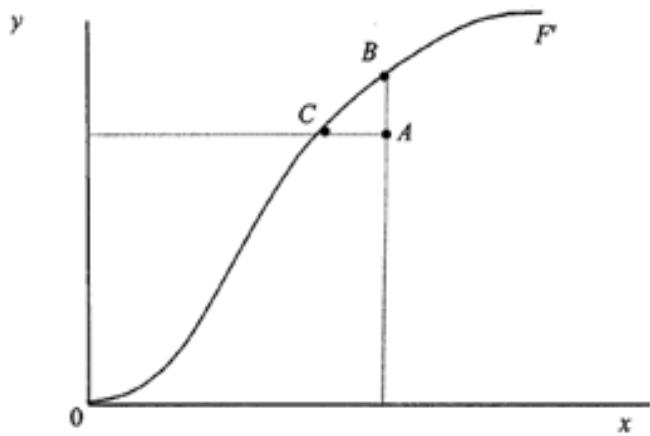
Source: Van Dooren et. al (2015)

2.6.3 Concept of Productivity

I already defined that performance can be seen as production process. Also I have said that productivity can be expressed as the ratio of the output(s) and input(s). Total factor productivity can be then obtain as a productivity measure involving all factors of production (Coelli et. al., 2005). Very often the term productivity is interchanged with the term efficiency, but there are differences between those two terms. In order to distinguish them, it is useful to consider a simple production process in which a single input (x) is used to produce a single output (y). Let us illustrate it with a graph. The line OF' in the Figure 6 represents a production frontier that may be used to define the relationship between the input and the output. The production frontier represents the maximum output attainable from each input level. This reflects current state of technology in the industry, so firms in this industry operate either on that frontier, if they are technically efficient or beneath the frontier if they are not technically efficient. Point A represents an inefficient point, whereas point B and C represent efficient points. A firm that is operating at point A is inefficient because this firm could

technically increase output to the level associated with the point B without requiring more input, or alternatively it could produce the same amount of output with less input. The Figure 6 includes also the concept of a feasible production set. This is the set of all input-output combinations that are feasible. This concept consists of all point between the production frontier OF' , and x-axis. The advantage of the set representation of a production technology is made clear when we discuss multi-input / multi-output production (Coelli et. al, 2005), which is one of the specification of museum production function.

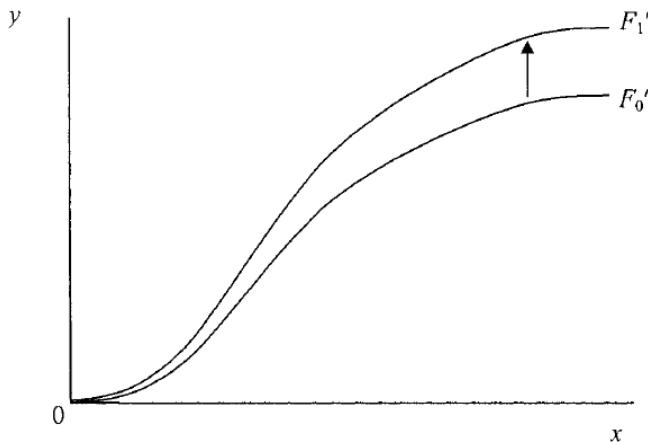
Figure 6 Production Frontier and Technical Efficiency



Source: Coelli et. al. (2005)

It is important to consider productivity comparisons through time, an additional source of productivity change, called technical change, which involves advances in technology that may be represented by an upward shift in the production frontier illustrated in the Figure 7. This can occur, for example, when museum starts to use new information technology.

Figure 7 Technical Change Between Two Periods



Source: Coelli et. al (2005)

2.6.4 Performance Measurement in Public Sector

The important period for performance measurement is 1990s, since in this time New Public Management (NPM) was introduced. The NPM doctrine has all the characteristics of a performance movement that says that public organizations and agencies should be subdivided into small policy oversight boards and larger performance-based management organizations for service delivery. Performance was to be the criterion to evaluate these organizations, and this required measurement in an all-inclusive way (Van Dooren et. al., 2015). In 1990s we can see that there was the rise of performance as an issue in public sector theory and practice. A mantra appeared in this decade, heard at all levels of governments, that calls for documentation of performance and explicit outcomes of government action (Radin, 2000). This trend saying “If you can’t measure it, you can’t manage it” has become a familiar refrain (Van Dooren et. al., 2015).

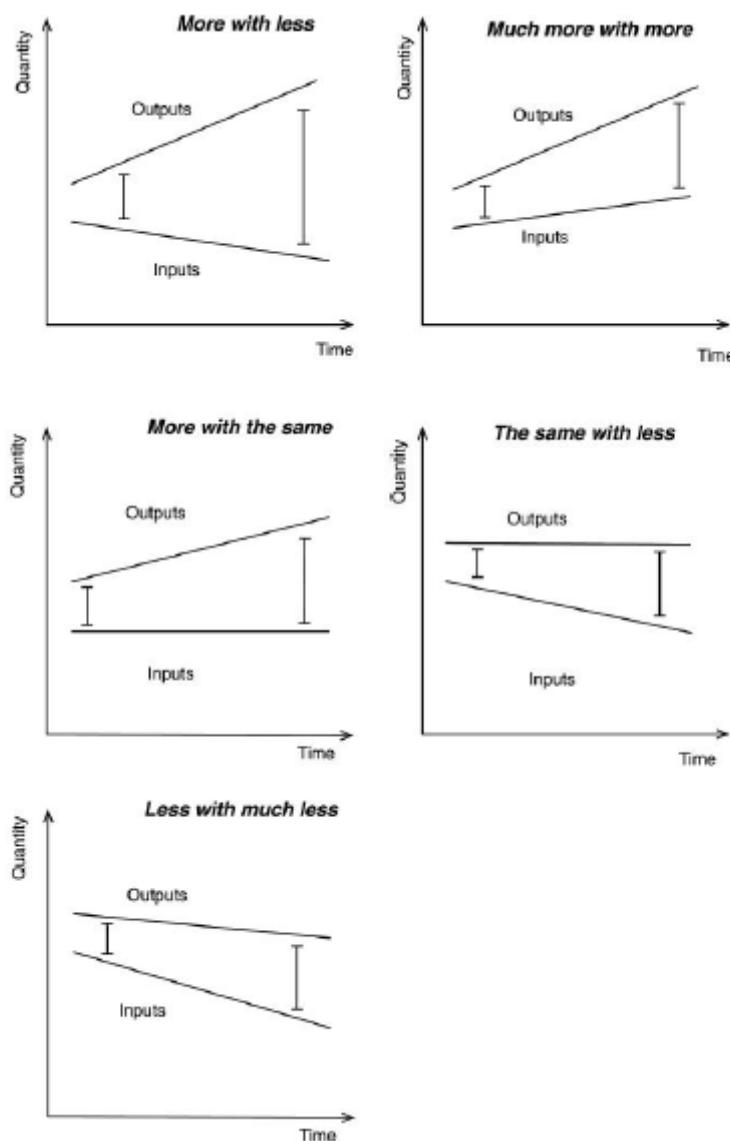
The main purpose of performance measurement should be to support and strengthen management and decision-making processes within an organization, such as planning, budgeting, the management of organizations and employees, program management, process improvement, grants and contract management, and also comparative benchmarking (Van Dooren et. al., 2015). What exactly means the term performance measurement? Van Dooren et. al. (2015) defines it as the process of quantifying past action, where measurement is the process of quantification and past action determines current performance. From my point of view, performance measurement does not need to be only quantification of activities, because

in this case, it would exclude qualitative criteria and metrics and in particular in the case of museums, qualitative criterions are extremely important.

The important part of measuring performance is systematically collecting data by observing and registering performance-related issues for some performance purpose (Van Dooren et. al., 2015). Incorporated performance information can be useful for designing policies, for allocating resources, competencies and responsibilities, for controlling, for evaluation and self-evaluation, and for accounting mechanisms.

As it is defined in the chapter Definition of Performance, performance represents a ratio between inputs and outputs then we can define different strategies to improve performance. The Figure 8 illustrates these different strategies how to improve the ratio between inputs and outputs. The first scenario represents the typical requirement for public organizations they are asked to do more with less resources, in other words work better and cost less. The second one shows the way of improvement when an organization should do much more with some more investment. The third scenario represent the situation when more outputs are required but with the same amount of inputs. This is with the first scenario quite common strategy in governments. The next scenario, called the same with less, requires to produce the same amount of output but with less input. This scenario is linked with decreasing art funding, when museums, and other public cultural organizations, are asked to produce the same amount of output of the same quality but with less money, less employees, etc. The last scenario, less performance with much less inputs, expects that an organization will produce less output but with much less input. This situation is represented by the drastic budget cuts and only minor consequences are expected.

Figure 8 Performance Strategies



Source: Van Dooren et. al. (2015)

The result of performance measurement is performance information that is more and more important and required in the contemporary world. NPM have strongly promoted the use of performance information for accountability purposes. Of course, performance information is not an end in itself, performance information may be used for several purposes, for example, to measure progress towards achieving organization's objectives, promote the accountability of museums to the public and stakeholders, compare performance in order to identify where is a room for improvement,

2.6.4.1 Performance Measurement Process

Performance measurement system within an organization helps to answer many questions, such as how is our organization doing, what should we measure, where should we focus our limited resources in order to increase our effectiveness etc. To answer those questions useful for management of the organization and its success.

It is absolutely necessary to establish performance measurement process and system once we decide to measure our performance. Performance measurement system enables an organization to collect data and analyze them in order to improve its activities.

Figure 9 shows a performance measurement system that consists of nine main phases. Mission and vision of success represents the mission that interprets the purpose of the organization, and a vision of success. When measuring performance, we have to keep always in our mind the mission of the organization, this is the reason is why it is situated in the centre of the circle. Activities represent any programs, and services. In case of museums these are exhibition, publications, education programs, restoration, research, partnership, etc. Operations are understood as the organization's infrastructure that supports these activities (financial management, human resources, technology, etc.) Together, activities and operations create everything what an organization does in order to fulfill its mission and realize its vision of success. As we can see in the Figure 9, the performance measurement cycle starts and ends with organization's activities and operations, as it moves through the following phases. The first phase is the moment when the organization decides to measure its performance. At this moment, it is recommended to form a performance measurement working group that should include organization's leaders and key program staff.

After this decision is made, we need to determine, what is to be measured. This is important moment with the performance measurement process, since we decide which activities within the organizations are crucial and needs to be monitor and measure. Also we have to decide which activities will be relatively easy to monitor, since it is necessary to realize, that performance measurement must bring more than what is costs. The next step that is strictly linked with the previous one, is the selection of performance indicators and tools how to measure our performance. It is necessary to select indicators that will make it possible to assess the fundamental areas of our organization. It is not possible to measure everything, so we need to prioritize what kind of information we need to know. We have to also be careful with the number of performance indicators. At this moment we should focus more on quality of information that performance indicators will provide us than to try to monitor huge amount

of indicators, but at the same time these indicators should provide us a comprehensive picture of our organization. Performance indicators should be divided into categories such as organization health indicators, program performance indicators, etc., the distribution of indicators depends on each organization. This phase consists also of selection of the tools we want to use for performance measurement. Several tools have been already invented for this purpose and it is task of performance measurement to decide which one they will use. Also, in this phase we need to decide how we will store our data, and articulate the process that will enable our organization to track data regularly.

This phase is followed by the data collecting. At this time, we collect raw data. Of course, this data are collected based on the indicators and tools selected in the previous step. Significant aspect within data collecting is whether organizations use internal or external data sources. Internal data are obtained within and by organization itself and external are usually purchased from outside. Sometimes it can be useful to ask the third person to provide or collect us data, since there is higher probability that the data will not be manipulated.

After we have the proper data, we can analyze them. Raw data itself are not really useful, we need to analyze them. The purpose of this step is to transform data into information. Van Dooren et. al (2015) distinguish three main interpretative strategies.

1. A first strategy is to confront a result with a norm. In this case, a norm has to be set in advance and represents a target. In order to compare our organization with a peer benchmarking techniques are used (DEA, FDH).
2. A second strategy is to launch data in order to understand where, when and for whom performance is manifesting. This requires the breaking out or aggregation of the data.
3. A third strategy is based on searching for causes of (under-)performance. This strategy is often based on hypotheses about the explanatory variables.

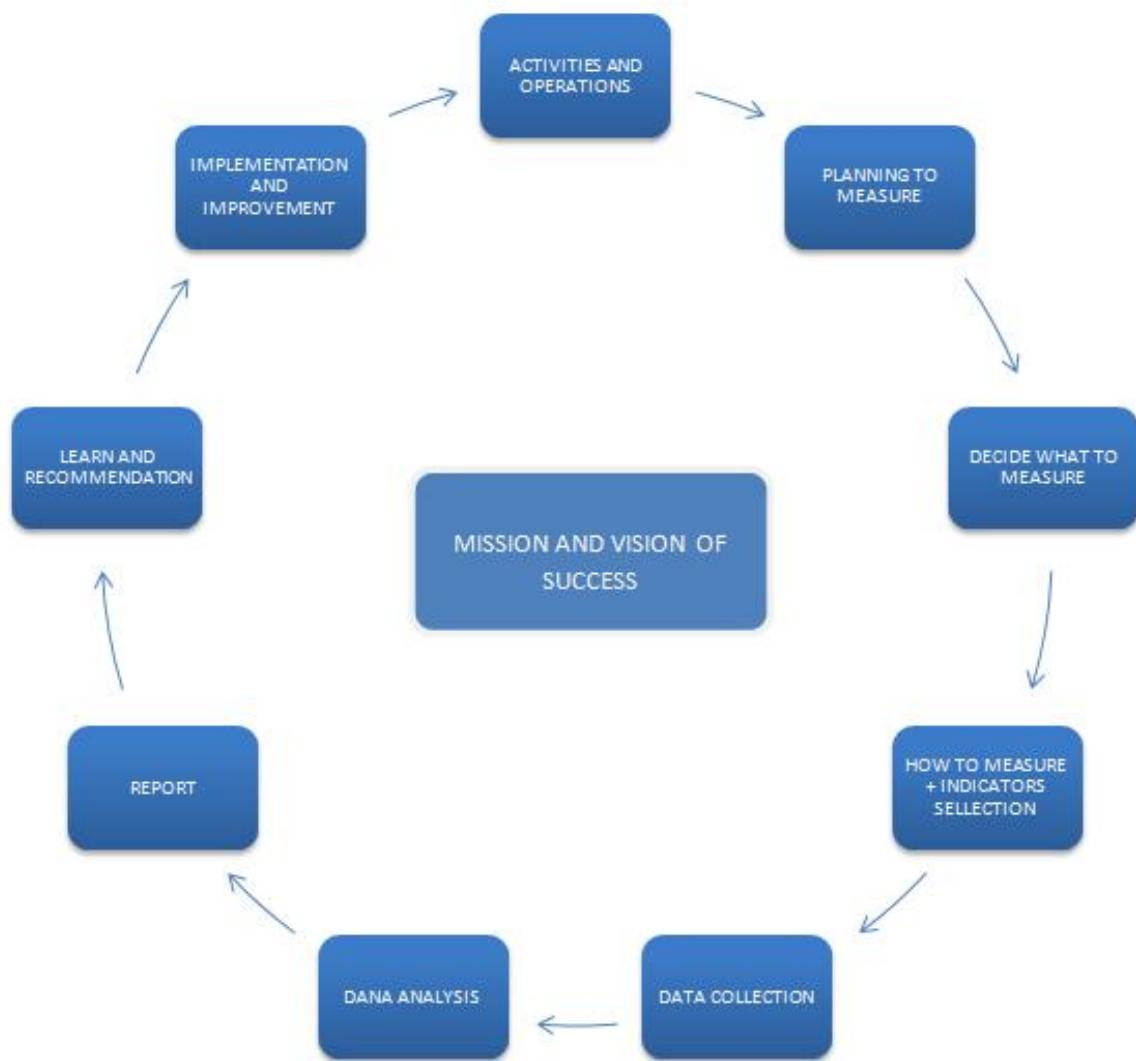
After the analysis, it is crucial to create report that is familiar for our employees and key stakeholders and that explains performance indicators and information. Usually, organizations can use a dashboard or a report card for this purpose. The format of a report should be appropriate for the target group we are creating it for. A report that is prepared for top management of our organization will have different format than a report for media. So we need to answer the questions, who will be a consumer of the information and what is the right form? Managers tend to prefer scorecard format that enables fast managerial judgment, whereas media requires deeper explanation. The question of format is also important, there

are different format, such as annual report, that might be for reporting to stakeholders and interest groups.

The following phase, learn and recommendation, uses the reporting tools in order to review and interpret performance data and identify opportunities and rooms for improvement and also after it is necessary to propose solutions. Then we can implement steps defined in the previous section in order to improve our performance. After this phase, performance measurement system circle stars again with activities and operations.

It is crucial to conduct all these activities in order to have comprehensive performance measurement process.

Figure 9 Performance Measurement System



Source: Author

In order to build an effective performance measurement system, it is necessary to follow the six key principles introduced by Audit Commission (2000):

- Clarity of purpose – the purpose of this principle is to be conscious of who will use information and how and why the information will be used.
- Focus – as described above, all performance measurement activities should be focused on the mission and priorities of the organization.
- Alignment – the performance measurement system should be aligned with the objective-setting.
- Balance – the set of indicators should provide a balanced picture of the organization's performance.
- Regular refinement – the performance metrics should be kept up to date to meet changing circumstances.
- Robust performance indicators – the indicators should be sufficiently robust and intelligible for their intended use.

2.6.4.2 Performance Indicators

Performance indicators are mentioned in the previous chapter, they are significant aspect of performance measurement. Performance indicators refer to the means by which objectives of the organization can be judged whether they have been achieved or not. Performance indicators are therefore closely linked with the goals and objectives of the organization and they simply represent the standard by which we can measure the level of success.

It is extremely important for an organization to select suitable set of indicators that provides a comprehensive view of the organization. Before selecting indicators, an organization needs to address two questions: What topic should the indicators focus on? What aspects should be measured? First of all, performance indicators should focus on the service that the organization provides and is important for it. In order to do so, the organization needs to be clear about what it is seeking to achieve, what are the core objectives and how the organization wants to achieve those objectives.

Performance indicators should focus on the actions and services provided at each level within the organization. High level indicators address corporate issues, lower-level indicators focus on operational and day-to-day matters. It is really important to develop a balanced set of performance indicators that takes into account all aspects of the service (Audit Commission, 2000).

Common way how to develop performance indicators is to use three dimensions of economy, efficiency and effectiveness. This Three Es concept is already mentioned in the chapter Definition of Performance and indicated in the Figure 5. The basic measures when constructing the Three Es are:

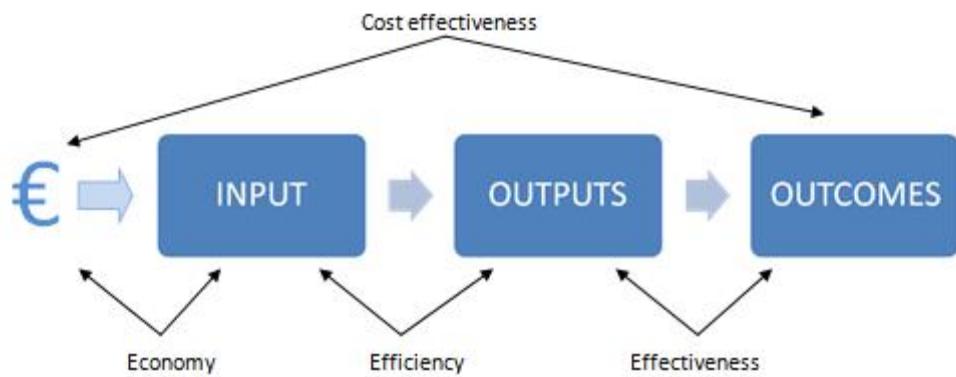
- Costs = the money spent to acquire the resources
- Input = the resources employed to provide the service
- Output = the service provided to the public
- Outcomes = the actual impact and value of the service delivered

The definitions of Economy, Efficiency and Effectiveness are in the chapter Definition of Performance. Figure 10 illustrates the relationship between the Tree Es and input, output and outcome. Economy is acquiring resources of the appropriate quality and quantity, the first them in the figure. Example could be the cost of new acquisition for museum collection, or the cost of new books for museum library. Efficiency represents producing the maximum outputs for any given set of inputs. The example is the cost per visitor to museum. And effectiveness is about meeting the citizens' requirements and having a program or activity, achieve its goals and aims. The example is then percentage of museum visitors who are satisfied with the visit or program. Some organizations add also another Es, because they argue that the approach of Three Es is very narrow concept of performance and that there are other important dimensions that need to be evaluated, such as: equity, excellence, entrepreneurship, expertise, electability (Jackson, 1991). Equity captures the degree to which access to services are appropriate to the needs of all those who should be able to use them. Aspect of excellence takes into account the quality of the service provided. The dimension of entrepreneurship considers that since museum managers are more and more forced to look for alternative resources, therefore, there are forced to be more imaginative and enterprising. Expertise is linked with the lack of management skill of expertise among museum managers in the process of dealing with evaluation of museums. In order to overcome this, the changes in education programs for museum professionals need to be made. The last dimension electability is important for public museums, since it takes into account a politician dimension and a series of political accountabilities are considered. This dimension treats the question such as: What is the political value placed upon museum services? What is role of played by national and local politicians in ensuring the performance of museums?

This framework that is extended and that aggregates the concept of Three Es with other dimensions bring the issue of performance measurement closer to the real world and closer to the real problems of management problem.

The specification related to outcome measures is the search for cost-effectiveness indicators, where links are seek between resources and effectiveness or outcome.

Figure 10 Economy, Efficiency and Effectiveness



Source: Audit Commission (2000)

A good indicator should meet following requirements (Jackson, 1991):

- be relevant,
- easy to understand and use,
- be sensitive to change,
- be precisely defined,
- be understandable for users,
- be documentable,
- be comparable,
- be verifiable,
- be cost effective,
- be unambiguous,
- be attributable,
- be responsive,
- avoid perverse incentives,

- be statistically valid,
- be timely.

It is important to construct indicators that will be relevant to the objectives of the organizations that will be described in the way that the user of the information will understand. Performance indicators have to be comparable ideally they should be comparable on a consistent basis both between organizations and over time. Number of visitors to the authority's museums, for example, would be valid on a local basis over time, but for inter-authority comparison could be this type of indicator misleading, since the museums involved could vary in size, scope and in the type of area they are situated.

Performance indicators should be verifiable, it means they should be collected and calculated in a way that makes it possible to verify the information and the data.

Another very important criterion, mention also in the chapter Performance Measurement from a Critical Point of View, is cost effectiveness of the performance indicators, in terms of balance of the cost of collecting information with its usefulness.

Audit Commission (2000) proposed three types of indicators: outcome measures, the quality dimension and cross-cutting indicators. Outcomes measures are vital to monitoring the achievement of service objectives. But it can be very difficult to determine suitable outcome measures, in particular in cultural area. The reason, why it is difficult to construct outcome measures is, that outcomes may be long term and influenced by many factors. Economy and efficiency indicators can usually be constructed quite simply by looking at costs and at resource deployment. But to see whether the service is effective is really hard to determine. Outcome of our service may take long time to emerge, for example the impact of education activities may be possible to monitor very late after the activity.

Performance measurement system needs to address the question of quality, since it has been always the issue in public services. But the problem with the quality topic is that it is hard, if not impossible, to define. Moreover, what is high quality service for one can be low quality service for the other.

Cross-cutting indicators are the ones that measure the collective performance of more agencies, because some services can be influenced by more agencies.

When developing performance indicators, we need to be aware of the number of indicators. Again, the number of indicators depends on what is suitable for the target group and context.

The CIPFA⁵ report Measuring Up (1998) points out that a good rule is a set of 10 to 20 indicators for any one reader or individual manager.

⁵ CIPFA is The Chartered Institute of Public Finance and Accountancy

2.7 Performance Measurement of Public Art Museums

Measuring performance and evaluation of their activities is the topic of rising interest, nevertheless it is not anything new. Long time ago, museums started to capture the number of visitors, doing budgets, etc. But in last decades, the aim is to introduce system of performance measurement that would provide comprehensive view of the museums.

The most common use of the term evaluation appeared with the first public survey, at the end of 19th century. The main purpose of this survey was to prove that museums were worth receiving subsidies and that they have educational impact on public. At the end of 1920s American museums were under pressure to justify their utility and funding. More specific studies were developed by psychologists and sociologists and it then the concept of museum visitors evaluation has been used many times. Other milestone in evaluation and performance of museums was introduction of accreditation of museums in the early 1970s by American Association of Museums. In the opposite of public survey, the concept of museum evaluation was developed from and for museum community. The concept of accreditation is much broader than the previous one, it takes into account collections, conservation measures and research programs (Mairesse and Eeckaut, 2002).

Nowadays museums need to ask question such as: How are we doing? Are we achieving our desired impact? Are we performing effectively and efficiently? Are current resources being allocated efficiently? Museums should answer these questions in order not only to justify their existence, but also to improve their management, activities and service they provide, in short, do it for themselves. But unfortunately, so far, museums have not had convincing answer to these basic questions (Jacobsen, 2016).

Today's world requires more and more accountable results, and museums need somehow to demonstrate and promote their accountability. I think there is no doubt that existence of museums is meaningful and that museums have value and impact, but how to measure this value and is it even possible? Jacobsen (2016) says that “...museum are valued for a wealth of beneficial results beyond their focused mission and I believe that studying the alignment between a museum's intentions and its results will improve a museum's impact and performance...” (Jacobsen, 2016, p. 14). I agree that museums need measurements, but from my point of view, the intention of measurement should be, in the first place, to improve museum's decision-making and their activities. Of course, if they have system of performance measurement and are able to provide suitable document of it, they can use it also as a tool to prove and advocate their value. The question still remains in my head: What kind of tools

museum should implement? It is necessary to find right metrics in order to monitor museum's progress toward its goals.

Pressure of accountability is significantly put on all non-profit organizations, as illustrated also in the Harvard Business School Working Paper (2010), it says that nonprofit organizations has been preoccupied with two powerful mantras in recent years, first is the accountability (linked with NPM), demands from funders, taxpayers and other stakeholders to be more transparent about funding, spending, governance, and what they have achieved with the given resources. The second mantra is related to the impact or demonstrating results (Ebrahim and Rangan, 2010).

Also, the important person of museum management, Stephen E. Weil said that “*...over time, the museum field will need to develop a vast arsenal of richer and more persuasive ways to document and /or demonstrate the community beyond. Some of these ways may be quantitative but, to the horror of some social scientists, a great many may be anecdotal or qualitative. What is critical is that these evaluation techniques fit the real complexity of what museum actually do...*” (Weil, 2003, p. 53). I particularly agree with Weil about the fact that some of these ways can be quantitative, some anecdotal or qualitative. From my perspective, in case of museums, it is impossible to determine only quantitative metrics, if we want to provide comprehensive picture of the organization. It is necessary to combine quantitative and qualitative metrics. To successfully fulfill this task, we need to adopt a framework for monitoring the museum's field complex mixture of outcomes, audiences, and supporters, necessarily aligned with how the rest of the world sees the value, and ideally aligned with museum counting and accounting systems and with shared data. Since museums have wide range of impact, wide range of audiences, and supporters, different types of governance and ownership, because every museum is unique, and because every museum pursues its different mission in different way, the global field of museum has no simple and easy metrics to measure impact and performance (Jacobsen, 2016).

It is necessary to stress that performance measurement of public art museums faces several difficulties. First of all, a museum deals with a wide range of resources and many of them is not easy to measure because of their qualitative nature. Second, museums' purpose is to provide and a complex multiple product, which is not always tangible and commercial nature. And another reason is, that most of museums are non-profit organizations and profit may not be measured in solely financial terms and is not, in any case, representative of successful

management (del Barrio, 2009). Clearly, there is no single quantitative or qualitative metric against performance can be evaluated and ranked (Zorloni, 2012).

Those difficulties are not reason for not measuring performance and efficiency in museums, it is just necessary to find or invent alternative tools that would fit with museums' nature. Considering those difficulties, museum performance systems have to be based on multiple indicators that aim to include both qualitative and quantitative indicators, otherwise a system is not useful and is little value. That is why, from my point of view, to use multidimensional management tools such as BSC to evaluate a museum.

Some reasons, why museums should evaluate their performance have been already stressed above, considering Crowther (1996) those reason could be sum up into three:

- Evaluation for control. Evaluation for control is useful to find out, whether a museum is operating as expected or not. For this kind of control, it is necessary to have a plan and determined some metrics before the action.
- Evaluation for accountability. The rise of accountability is strong in our society and has become very powerful. It means that museums tend to adopt a stakeholder approach of performance evaluation (Zorloni, 2010).
- Evaluation for strategy formulation. This evaluation is concerned with prediction. When a museum is developing a strategy, it faces several alternatives from which it must select the most appropriate to its current circumstances and constraints, and to its future objectives. In order to make this selection, museum must have a means of evaluating the alternatives (Zorloni, 2010).

It is undoubted that the measurement of performance in museums is an important management function. Museum managers should monitor the achievements of their museum in terms of the museum's mission, objectives and tasks set out in their forward planning. It is obvious that a system of performance measurement can be developed to help managers to assess and communicate how well the museum is meeting its objectives over time. Performance measurement can help to lead to greater accountability and efficiency, and an improved sense of corporate purpose and success. Museum managers are accountable for the effective and sustainable use of the resources for which they are responsible, whether these are people, collection, equipment, buildings, money or time. So it is museum managers who are responsible or how well the museum performs, but also for monitoring of performance and developing of performance measurement system. This performance measurement system can be related to the museum itself as an organization, to the personal performance of

members of staff and to the financial efficiency of the museum. For museums, it is crucial, to look at performance not only from quantitative point of view, but it is crucial to take into account qualitative aspect. Eves, as I said above, qualitative performance tends to be difficult to measure. Where it is possible, qualitative performance should be measured against agreed standards, whether these are set internally by the museum, or devised by external bodies. A museum would be able to reach a defined standard, for example, in terms of the quality of care or storage for its art collection. A museum professional may be able to demonstrate a level of competence within an overall standard in terms of documenting an art collection (Ambrose and Paine, 2012).

There are different ways how to measure quantitative performance and at different levels of complexity. Simple performance indicators can be represented through the measurement of numbers, example can be the number of art works conserved or documented for a period of time. More complex indicators might be based on comparisons or percentage, example in this case might be the percentage of the items in the museum art collection waiting for conservation treatment. The measurement of input and output provides a method of determining efficiency. While qualitative measurement against standards can often provide an immediate picture of performance, the benefit of quantitative measurement will only be effectively realized through the analysis of trends in terms of year-on-year comparisons of performance in the museum. This part is deeply investigated in the following chapter.

2.7.1 Museum Performance Indicators

Performance indicators are the way how to answer the question in the previous chapter. I already defined what is a performance indicator, in this chapter I focus on performance indicator within museum sector. The use of performance indicators in the arts is quite widespread nowadays.

Jackson (1991) points out that it is useful to distinguish between performance measures and performance indicators. He says that where economy, efficiency and effectiveness, and the other Es can be measured precisely and unambiguously, it is usual to talk about performance measures. However, the most often the case is when it is not possible to obtain a precise measures and then we usually refer to performance indicators. They provide information that illuminate or measure progress in achieving the aims and objectives of a museum. Jackson (1991) also warns that the use of performance indicators is an aid to good judgment and not a substitute for it.

The main purpose of performance indicators is to warn managers about a need to examine the issue further. For example, the unit costs of museums as measured by the cost per employee, the costs per person admitted, or whatever, is not a performance measure, because it does not suggest that one museum is more efficient than another because its unit costs are lower. It is, instead, a performance indicator, since it signals to management the need to examine why the difference exists (Jackson, 1991).

The most important questions related to performance indicators are: What to measure and which methodology is to be used?

The use of indicators need to be developed within the analysis of the performance of a given subject, so it means within the museum sector and with museum community. Pignataro (2002) distinguishes micro and macro indicators. Micro indicators have been developed to measure the performance of individual art museums and macro indicators refer to entire museum sector or sub-sector (art museums, history museum, etc.). There are some indicators that are common to all fields of arts, like attendance and some have been specifically designed to capture some peculiar aspect of a given field of arts, in the case of museum, for example, collection use in museums.

It is possible to find many measures of very different elements of the performance of organizations. First, there have been measures that are simple quantitative description of some characteristics of arts production and consumption. Examples of this type of indicators are the number of staff in a museum, the cost of service, the number of attendances, the days open per year and etc. The second group of indicators is used as tool for evaluation of different aspects of the performance of museums. Examples of this type of indicators are costs per visitor, the ratio of public to total income and public subsidy per attendance. The difference between these two types of indicators lies in the object of measurement. The former indicators tend to measure a single real dimension of museum production and consumption of museum services and therefore they require the identification of this dimension and of the best way to measure it. When using these indicators, one must be aware of the fact that they represent a single dimension of a phenomenon and possibly a partial view of this dimension. The second type of indicators includes constructed measures and they are based on the definition of an aspect of performance, which is to be evaluated (efficiency, economy, effectiveness and so on). Also the object of measurement indicators is different with respect to the distinction between the output and the outcome of museum service. I already defined the difference between output and outcome, the output is the direct product of the activity of a museum and

outcome is the ultimate goals of museum activities, usually in terms of impact on its beneficiaries. Of course, identification, design and measurement of outputs is pretty easier than in the case of outcomes. Outputs are usually measured in volume and they can be related to other variables, to build indicators that evaluate how much is produced in relation to the amount of resources employed, the number of attendances and so on. It is not straightforward to identify outcomes, because they are not connected with characteristics of each artistic product but with the specific objectives. The difficulty of measurement of outcomes comes also from the fact, that most of the conceivable outcomes reflect qualitative aspects of museum service. The data gained for computing indicators are generally collected by any organization in a more or less same way (cost, attendance, number of exhibitions, etc.), the source of data for outcome indicators may be subjective, because they tend to reflect the subjective perceptions of individuals. Individual perceptions are idiosyncratic and therefore the outcome indicators will then be computed from data, which reflect different ways of measuring the same phenomenon (Pignataro, 2002).

Another important issue related to the performance indicators in museums is a methodology how to compute these indicators. Theory and practice of indicators usually represent them just as simple numbers which measure a phenomenon such as number of visitors, number of exhibitions, etc. or, more often as ratios, such as cost per attendance, number of custodians per visitor, etc. This type of indicators provides information on single aspects of museums production and consumption. But, when we consider the output of many museums, we can investigate that their production process is generally multidimensional, both from the input and the output side. A general evaluation of the efficiency of production can be then obtained only through a multiplicity of indicators. Moreover, as Pignataro (2002) stresses it is crucial to keep in mind when comparing the values of the same indicator for different museums, the relevance of the comparison is limited by the fact that quantities of output, multiples or submultiples of that achieved by any given museum, are not necessarily technically attainable employing multiples or sub-multiples of the inputs used by that museum. Therefore, there is a need to employ more advanced techniques that take into account the multidimensional nature of museum activities. One of these techniques is, for example, DEA method, that is described later in this thesis.

As mentioned above, there are several problems related to the performance indicators. One of them rises at the moment when we interpret the numerical values of indicators to make judgment. The analysis of the scores resulting from the application of performance indicators

requires additional information on the factors that may affect the different aspects of performance. This is extremely important, when we want to compare more museums. The similar problem is linked also with outcome indicators, because the impact on the ultimate goals of museum service is connected not only with museum output but also with a variety of factors which are outside the control of museums.

There have been several attempts to create a set of suitable indicators for museum, two of them that I would say were the most important have been the ones by Ames (1994) and Jackson (1994).

Ames (1994) introduced several indicators that are ratios in many categories described in the Table 4. Ames tended to cover wide range of museum activities and focused on indicators that speak more to mission integrity and accountability than efficiency. He also determined the sector range that could include the norm for an individual museum's chosen sector, if determinable. The target range column could include whatever goal or acceptable range an individual museum sets for itself. Whatever entries appear here are offered as possible targets. Ames tried to select only the most important indicators and to keep the total under fifty. These indicators should be considered just a start. In the future function, specialists, that is curator, fundraisers and others, would gather to determine if there are better indicators and if the definitions should be tightened. Also individual institutions would determine what target ranges they want to set for which indicators. The last step would be that national and subject matter museum associations report existing ranges at least by subject matter, size, and perhaps age. This list is proposed as an annual report that monitors and provides information not only for museum managers but also for other stakeholders how is a museum performing. Again, from my point of view, this list is not appropriate for benchmarking. It is useful for a museum itself, but not for ranking of several museums. Of course, we can hardly apply some criteria to Czech museums, for example criterions related to volunteers, since Czech museums mostly do not work with volunteers. Or criterion about minority attendance is difficult to measure, since majority of the Czech museums do not monitor, because majority of Czech museums do not do survey about their visitors. Problematic aspect could be also the size of a museum, since this number of indicators is not suitable for small museums.

Table 4 Performance Indicators / Criterion / Results

Performance measure / purpose	Formula / ratio	Sector range / norm	Target range
Attendance trend	$\frac{\text{This year's total attendance}}{\text{Avg. of last 3 yrs. attendance}}$		
Capacity utilization	$\frac{\text{Total annual attendnace}}{\text{Sq. ft. accessible to the public}}$		
Low income accessibility	$\frac{\text{Hrs. per week avail. for free}}{\text{Total hours per week accessbile during minimum 3 – month period of maximum public accessibility}}$		Minimum 7 %
Minority attendance	$\frac{\text{Annual minority attendnace}}{\text{Total attendance}}$		
General accessibility	$\frac{\text{Avg. no. of hrs. open: per week per week other than 9 – 5 on Mon. –Fri}}{\text{per week other than 9 – 5 on Mon. –Fri}}$		Minimum 40/10
Admissions financial efficiency	$\frac{\text{Admissions budget}}{\text{Total attendance}}$		\$ 0.30-040/visito
Admissions staff efficiency	$\frac{\text{Admissions FTE staff}}{\text{Total attendance}}$		
Security efficiency	$\frac{\text{Security cost}}{\text{Total sq. fr./attendance}}$		
Balance of mission /market financing	$\frac{\text{Sales income}}{\text{Total income applied to operations}}$		30 - 70 %
Financial strenght	$\frac{\text{Total endowment mkt.value}}{\text{Operational budget}}$		Minimum 2/1
Fundraising financial efficiency	$\frac{\text{Fundraising costs}}{\text{Fundraising income}}$	18 - 23 %	
Sponsorship philanthropy	$\frac{\$ value of services rendered to sponsors}{\text{Total sponsorship}}$		Maximum 15 %
Fundraising staff efficiency	$\frac{\text{Fundraising staff FTE}}{\text{Fundraising income}}$	\$ 200 - 400,000	
Realization of membership potential	$\frac{\text{Total individual or family membership}}{\text{Total annual attendance}}$	1 - 5 %	
Membership revenue rate	$\frac{\text{No. of members who renewed}}{\text{Total membership last yr.}}$	60 - 75 %	
Role of human resources	$\frac{\text{Staff salaries and benefits}}{\text{Total budget}}$	60 - 75 %	
Staff attrition rate	$\frac{\text{Exempt FTE departures}}{\text{Exempt FTE staff}}$		10 - 15 %
Staff intellect/contribution to field	$\frac{\text{No. of advanced degrees or No. of external publ. this year}}{\text{Total staff FTE}}$	$\frac{1}{20 - 30}$ $\frac{1}{50 - 75}$	

Benefits equity	$\frac{\text{Staff benefits } (\$)^2}{\text{Staff payroll } (\$)}$	18 - 25 %	
Staff efficiency: personnel volunteer services	$\frac{\text{Personnel staff FTE}}{\text{Staff FTE}}$	1	
	$\frac{\text{Volunteer services staff FTE}}{\text{Volunteer FTE}}$	50 - 70 10 - 15	
Volunteer contribution	$\frac{\text{Volunteer FTE}}{\text{Staff FTE}}$		7 - 12 %
Commitment to staff training	$\frac{\text{Staff training expenses}}{\text{Staff FTE}}$		
Volunteer / exempt staff tenure	$\frac{\text{Volunteer/exempt staff FTE with 2 + yrs longevity}}{\text{Volunteer FTE}}$		40 - 50 %
Per visitor gross sales income	$\frac{\text{Gross admissions, shops, food income}}{\text{Total annual attendance}}$		
Marketing efficiency	$\frac{\text{Total mktg budget}}{\text{Total admissions income}}$	12 - 15 %	
Publicity effectiveness	$\frac{\text{No. of unpaid media exposures}}{\text{Total publ. city budget}}$		
Shop efficiency: Sales per a) square foot b) buyer c) visitor	$\frac{\text{Shop net income}}{\text{a) public square feet}}$ $\frac{\text{b) No. of transactions}}{\text{c) No. of admissions}}$	a) \$3-500 b) varies c) varies	
Shop/food surplus margin	$\frac{\text{Shop income}}{\text{Shop expenses}}$ $\frac{\text{Food income}}{\text{Food expenses}}$		
Food sales efficiency: sales per square foot and buyer	$\frac{\text{Food sales gross income}}{\text{Public sq. ft. No. of sales}}$		
Parking surplus margin/income per visitor	$\frac{\text{Garage income}}{\text{Garage expenses/users}}$		
Shop inventory turnover	$\frac{\text{Total shop sales}}{\text{Average retail value of inventory}}$	2.5-3 1	
Operations surplus/deficit	$\frac{\text{Operating net income}}{\text{Operating expenditures}}$		0 - 5 %
Investment acumen	$\frac{\text{Endowment income and}}{\text{capital appreciation}}$ $\frac{\text{Endowment market value at end}}{\text{of last year}}$		
Commitment to maintenance	$\frac{\text{Building maint. expenses}}{\text{Total square feet}}$		
Borrowing capacity	$\frac{\text{Debt service costs}}{\text{Total income applied to operations}}$		0 - 5 %
Capital asset replacement funding	$\frac{\text{Reserve for accumulated}}{\text{depreciation}}$ $\frac{\text{Accumulated depreciation}}{\text{Accumulated depreciation}}$		
Financial staff efficiency	$\frac{\text{Financial staff FTE}}{\text{Total operating budget}}$	1 \$2 - 3 million	

Energy efficiency	$\frac{\text{Energy costs}}{\text{Total sq. ft.}^2}$		
Operating cost per visitor	$\frac{\text{Total operating expenses}}{\text{Total attendance}}$		
Collection use	$\frac{\text{No. of collection objects exhibited}}{\text{No. of objects in collection}}$		
Collecting/conservation commitment	$\frac{\text{Additions to collection/conservation budget}}{\text{No. of objects in collection}}$		
Commitment to evaluation	$\frac{\text{No. of evaluations performed}}{\text{No. of educational programmes offered}}$		$\frac{1}{7 - 10}$
Commitment to education	$\frac{\text{Education staff payroll}}{\text{Total staff payroll}}$		Minimum 10 %
Exhibit maintenance capability	$\frac{\text{Exhibit maint. staff FTE}}{\text{Exhibit square feet}}$		$\frac{1}{10 - 12,000}$
Exhibit/exhibition balance	$\frac{\text{Temporary exhibit space (square feet)}}{\text{Total exhibiti/exhibition space (sq. ft)}}$		10-20 %
Average exhibit maintenance results	$\frac{\text{Exhibits cut of order}}{\text{Total no. of moving part exhibits}}$		5-8 %
Financial self-reliance of education	$\frac{\text{Educ. fees, grants + restricted endowment income}}{\text{Education budget}}$		Minimum 70 %

Source: Ames (1994)

Another important attempt to set a series of performance indicators for museums has been made by Peter M. Jackson (1994). The basis for his set were two papers, one from Ames mentioned above and one from the Audit Commission in the UK. Jackson presents performance indicators within the context of the value-for-money framework (3 Es) along with additional suggested indicators. Here is the list proposed by Jackson (1991).

- Cost indicators (economy)
 - gross costs of service
 - gross costs per visitor
 - ratio of revenue to gross costs
 - conservation / curatorial expenditure
 - operating costs per visitor
- Level of resourcing indicators
 - These indicators will include index of revenue resources, capital resources, equipment and buildings. Examples of indicators of resources will include:

- the number of staff on the pay roll
 - the ratio of administrative staff to operative staff
 - the square footage of buildings space
 - the ratio of the square footage of space devoted to specific activities to the total available space
- Sources of funds indicators
 - the ratio of public to total income
 - the ratio of market generated income to total income
 - the ratio of income from various sources to total income
- Volume of service
 - These indicators are a crude signal of the demand for the service. Examples:
 - the number of attendances
 - attendances per day open
 - attendance trend – this year's total attendance divided by the average attendance for the last three years
 - days open per year
 - hours open per day
 - collection use, i.e. ratio of total number of objects exhibited over the number of objects in the collection
- Productivity indicators (efficiency)
 - Productivity indicators are available for the museum as a whole or for specific departments or activities within the museum. Examples are following:
 - energy efficiency – the ratio of energy costs to total square footage
 - per visitor gross sales income (i.e. sales income from admissions, shops, food, parking, etc.)
 - marketing efficiency – the ratio of the change in the marketing budget to the change in total admissions
 - shop efficiency – ratio of sales per square foot or per buyer or per visitor
 - fund-raising efficiency – the ratio of the change in fund-raising costs to fund-raising income
 - proportion of collection documented

- proportion of budget allocated to conservation activity
- Availability of service (equity)
 - low income accessibility – ratio of hours per week available free to total hours per week accessible during minimum three month period of maximum public accessibility
 - minority attendance – ratio of annual minority attendance to total attendance
 - general accessibility – average number of hours open: per week or per week other than 9.00 am to 5.00 pm on Monday to Friday
 - number of concessionary users
 - number of concessionary users as a proportion of total users
 - number of users in target groups as a proportion of the total number in the target group
- Quality
 - exhibition maintenance – ratio of number of exhibits out of order to the total number of moving part exhibits
 - number of complaints from users
 - expertise of staff – ratio of staff training expenses to total number of staff/in full-time equivalents)
- Outcome indicators (effectiveness)
 - results of customer's perceptions of the display etc.

Jackson admits that this list of indicators is only suggestive, it is not prescriptive, nor is it exhaustive. Given the state of the art of performance measurement in the museums service any indicator of performance needs to be tested with a view to establishing whether or not the data exist for it to be calculated, the utility of the information that it provides for managers purposes, and the costs of acquiring that information relative to its utility.

Of course, performance indicators are themselves of little interest or value. The information content of indicators is only realized if they are compared with something. Jackson offers that this could be a set of indicators from different museum offering a similar range of services. As discussed before this is not so good, since each museum is specific and compare them with the set of indicators can be tricky. Another option is to compare indicator with the values of the same indicators of one museum taken from previous years. Another way in which indicators are used is to set target values for them. In case that the actual outturn is below the

target, then a diagnostic enquiry may be set up to find out why, for example if some unexpected event that lay outside of the control of management case the deviation. Or in case some targets were set unrealistic, or was the shortfall due to poor performance on the part of the management.

Variance between a performance indicator and its comparators does not automatically imply poor performance. They simply give signals suggesting that further investigation is necessary. There are many different reasons for such variances and poor performance is only one. Jackson (1988) has set out a number of criteria that can be used to judge the usefulness of performance indicators.

- Consistency – the definitions used to produce the indicators should be consistent over time and between units.
- Comparability – it is only reasonable to compare like with like.
- Clarity – performance indicators should be simple, well defined and easily understood.
- Controllability – the manager's performance should only be judged for those areas that he or she has control over.
- Contingency – performance is not independent of the environment within which decisions are made, this includes the organizational structure and the management style adopted, as well as the complexity and uncertainty of the external environment.
- Comprehensive – do the indicators reflect those aspects of behaviour that are important to management decision-making?
- Bounded – concentrate upon a limited number of key indexes of performance – those that are most likely to give the biggest pay-off in terms of valuable management information.
- Relevance – many applications require specific performance indicators relevant to their needs and conditions – do the indicators service these needs?
- Feasibility – are the targets based upon unrealistic expectations? Can the targets be reached through reasonable actions?

2.7.2 Other Existing Models to Evaluate Museums

The following models suggest how indicators might be organized into an evaluation framework for museums. All models share following basics:

- There is a need,
- There is an organization and resources to address the need,
- There is an audience that benefit.

Mark Moore's Strategic Triangle and Public Value

Moore's strategic triangle has been quite adopted within nonprofit world. This model has been intended for use in government social services. Moore's triangle involves an authorizing environment that works with the operating environment to produce the public value desired by both. The most efficient value is created when all three components are aligned (Johnson, 2016). Moore's perspective was that politics remain the final arbiter of public value just as private consumption decisions remain the final arbiter of private value (Alford and O'Flynn, 2009). Public value is central to Moore's approach, and it has also become central to the museum literature on value. Indicators are not policy, but only inform policy choices and management decisions. A warning should accompany the use of any indicators. Indicators are not marching orders or compensation indexes, but information perspectives on current positions and recent trends. In order to be progressive in a rapidly changing world, a museum's selection of indicators should help its leaders make visionary choices and evolutionary changes. The selection should not become just a report card, and the selection should evolve as well. For museum, impact and value must be evaluated both quantitatively and qualitatively, numbers and stories, and in the hearts of nonprofit, it is the emotional story and theory of action narrative that drives support and engagement.

Others have expanded Moore's strategic triangle into evaluation framework, such as Cole and Parston's Public Service Value Model methodology that measures how well an organization, or series of organizations, achieves outcomes and cost-effectiveness year after year. This methodology provides public managers a way to evaluate an organization's performance in relationship to the organization's average performance over a series of years (Alford and O'Flynn, 2009).

Theory Based Evaluation

Birckmayer and Weiss (2000) in their *Theory-Based Evaluation in Practice: What do We Learn?* Say that all programs have a theoretical basis, no matter how weakly the assumptions are articulated. Program people make some assumptions about why the set of activities they plan will lead to desirable outcomes. If a museum wants to change a world in some way, what are its theories about how it will bring about and measure those changes? Their approach related to museums is an approach to evaluation that requires the assumptions on which the program is based in considerable detail: what activities are conducted, what effect from each step in the sequence to see whether the expected ministeps actually materialize (Birckmayer and Weiss, 2000).

Their model is based on a theory of change and a theory of action, which may be synonymous to some. Others draw a level distinction, meaning that a theory of change covers the big picture, for example, museums use their resources to change lives, while a theory of action details the pathway, steps, and actions the museum takes to change lives, while a theory of action details the pathway, steps, and actions the museum takes to effect its desired changes.

A theory of action maps out a specific pathway in that theory of change, or an organization's role with respect to achieving that change, based on an assessment of how it can add the most value to the change process (Weisbord and Sniad, 2005/2006).

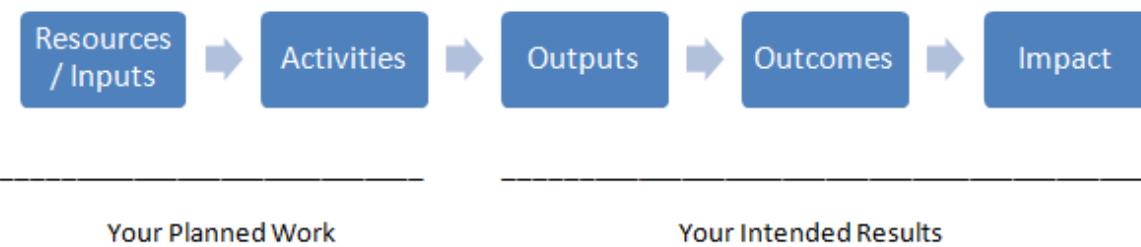
The more detailed and therefore more observable theory of action is the more useful of the two terms to address the complexity of the museum field and to provide a meaningful framework for evaluation (Johnson, 2016).

Logic Model

Logical model is very similar to the previous Theory Based Evaluation model, but logic model adds definition to the steps. This model provides a road map of your program, highlighting how it is expected to work, what activities need to come before others, and how it is expected to work, what activities need to come before others, and how desired outcomes are achieved (Kellogg, 2006). This traditional, one-way logic model is a way of connecting a project's goals to resources investments, to activities, to outputs, then to outcomes, and finally to impacts and social values.

Diagram shown in the Figure 11 horizontally connects the boxes in each step of the logic model in order to evaluate and measure a program's effectiveness and efficiency in transforming a funder's grant award into community impact and public value.

Figure 11 Basic Logic Model



Source: W K. Kellogg Foundation, *Logic Model Development Guide* (2004)

It is really tempting to use logic models to evaluate entire museums as well as their individual grant-funded programs. However, a one-way logic model approach assumes the museum vs. the world, and the museum is judged and valued on how well it succeeds in improving them.

Museum Theory

There is a need to establish the conceptual framework for museums, beginning with concepts and assumptions why museums exist and for whom. The conceptual foundations have implications for today's museum leaders:

- Dana's implication: museums are responsible for offering their communities services that address their needs and aspirations (Peniston, 1999).
- Weil's implication: museums should use their resources to achieve their purpose, and be evaluated on how effectively and efficiently they do that (Weil, 2005).
- Dierking and Falk's implications: museums operate in a competitive, free-choice marketplace by offering physical and social services valued by their audiences and supporters (Falk and Dierking, 2000).
- Hein's implication: museums aspire to make the world better and more democratic, such as advancing community development and social good (Hein, 2011)

Synthesized, these concepts underlie museum economic theory: the community funds the museum to use its resources to provide effective services back to the community. The museum provides these services efficiently and, instead of privatizing its net revenue, contributes to community development and social good (Johnson, 2016).

Infrastructure Model

This model suggests that museums are evaluated by how well they fill their niche within a community's cultural, education, civil, and economic systems. Does the city have enough quality leisure attractions? Are there enough interactive galleries for children? Do we have venues for blockbusters that draw tourists? Do we have enough trusted places for community

gathering and celebration? Measuring fit can be a quantitative evaluation: a museum or a city can compare data on its assets, for example, total amount of exhibit space, number of program spaces, collection size, staff count, endowment, etc, to peer in other communities to identify areas where they can expand to fill niche pioneered by their peers.

Scott's Typology of Values

Carol Scott is one of the most important researchers related to the museum value nowadays. The previous frameworks look at museum purposes expressed by museum professionals. Research Carol Scott also looked at the end results, the values end-users believe museum offer. Scott's research had two cohorts and sought the common ground of values shared by both the public using museums and the professionals working in them and how those shared values might relate to a typology of values (Johnson, 2016).

Scott (2007), in her *Advocating the Value of Museums* reported on the results of the literature review and observed: "*In the burgeoning literature on this subject, value is described across a variety of dimensions and three main beneficiary groups. The dimensions include instrumental, intrinsic, institutional, and use values. The beneficiaries of these values can be individual, communities and the economy*" (Scott, 2007, p.4).

Scott tests the evidence base for each of these four dimensions. Instrument value describes the utilitarian and instrumental benefits through economic benefit such as civil branding, tourism, employment and the multiplier effect on local economics, through social benefits including increase social capital, inclusion, social cohesion, tolerance for cultural diversity, urban regeneration and civil participation and through benefits to individual such as learning, personal wellbeing and health (Scott, 2007, p.4).

Intrinsic value is in the heart of the intangibles of museum experiences. For individuals, intrinsic values are experiences and a state of absorption and deep satisfaction that the pleasure of seeing an artwork or having a cultural experience that is moving and meaningful can engender (Johnson, 2016).

Institutional value refers to the value created by government through services, laws, regulations and other public institutions.

Use and non-use value is about that direct use of cultural services is a key indicator in determining public value. Willingness to give something up, to spend money, to commit energy and to spend time visiting, using, enjoying and traveling to and from cultural activities are tangible demonstrations that the public values culture (Scott, 2007, p. 5).

Scott's research and writing make a strong case that museums offer value not just in what they do, but in what they mean, in how they are used, and in their very existence as public asset (Johnson, 2016).

Mulgan's Indicator Types

Geoff Mulgan was a policy director for Prime Minister Tony Blair and he observed in the Stanford Social Innovation Review that nonprofits often measure and report on value in three different ways to different audiences: external advocacy and validation, internal management metrics, and impact evaluation studies for specific funders. Different methodologies are used for each these different ways of counting and describing also complicate the way towards clear and meaningful measures of value (Mulgan, 2010, p.8).

Mulgan's division of the three different ways nonprofits report on value is similar to the categories of purposes, key performance indicators, and outcomes, as used by museums:

- External advocacy validation: indicators tend to fall into the institutional purposes and guiding principles categories where mission statements, strategic objectives, corporate values, marketing promises and other intentional purposes are expressed and used in external case statements and marketing materials intended for generating support and earned revenue. These indicators are primarily qualitative statements.
- Internal management metrics: internal management metrics count both capital assets and operating outputs and costs, align with the categories of resources, activities, operating data, and key performance indicators for measuring efficiency and performance. These indicators are primarily quantitative data.
- Impact evaluation studies fall into the perceived value category of indicators for assessing effectiveness at achieving desired outcomes and impacts, these indicators include both qualitative and quantitative data (Johnson, 2016).

Weil's characteristics of a good museum

Weil (2005) defines the characteristics of a good museum describing a success/failure matrix capable of determining the museum's overall performance. Weil identifies four key dimensions of a successful museum:

- Ability to articulate a clear purpose.
- Ability to assemble the resources necessary to achieve that purpose.
- Possession of the skills necessary to expend resources so as to create and present public programs that achieve the purpose (effectiveness)

- Managerial skills necessary to create and present those public programs in an efficient manner (efficiency)

Weil (2005) suggests that a successful museum is one that can produce positive outcomes for the communities it seeks to serve. A positive outcome is represented by the preservation of collections for future generations and a beneficial effect on the communities the museum seeks to serve with the programs offered. This idea is not new. Orr (1973) first expressed the view that it was possible to consider performance measures as a continuum reflecting the transformation of resources into goods or services and ultimately having an impact on society as shown in the Figure 12 (Zorloni, 2012)

Figure 12 Success/Failure Matrix



Source: Weil (2005)

2.7.3 Peer Review

I have already mentioned the issue of comparison of a museum to its peer. Even museums are very specific institutions and each museum has its own characteristics, comparison can be conducted. Comparison should be used again for an organization itself, it should be the way how to discover its weaknesses and strengths and the way how to get inspiration from other museums. Several museum associations offer formal institutional assessments conducted by peer museum managers. Some of them offer even an accreditation, this tendency is the strongest within the American museums.

Museums that have similar missions, business models, resources, and context can compare their relative performance.

Comparing a museum's KPIs with those of peer museums is an informative exercise that helps museum leadership see where their museum excels and where there may be growth or efficiency potentials. Comparing a museum's metrics to the average and mean of a sample of peer museums becomes more meaningful as the definition of peer gets closer to the museum's unique definition, and as the sample size gets larger (Johnson, 2016).

But the question is what are peer? Johnson (2016) defines four filters of peer:

- First, peer are museums of the same type, discipline, or sector of the museum field, such as other collection-based art museums, or other historic house museums, or municipal zoos.
- Another definition is the group funded by similar business models. Peer museums will have similar revenue sources, which can be approximated by looking at their share of earned-to-support revenue, and, within support, to the relative share of public or private funding. A government museum with free admission is not a peer to a museum dependent on admissions revenue.
- Operators of similar resources: A museum's operating data is shaped by its physical resources (site, facility, collections, and exhibits), human resources, and endowment. Ideally, meaningful comparables should have roughly the same components, building size, staff size, annual budget, and capital assets.
- Or museum located in contexts as similar as possible. Comparable museums should be in similarly sized cities, communities, or markets, ideally in the same climate and with similar disposable household incomes and similar education levels. Similar governance and control are needed, government, and nonprofit mandates are different. Location is also a factor: urban or suburban, unique building or tenant in a complex.

In case enough amount of museums share these filters, they form a peer group that can make meaningful comparisons and assess relative performance for specific KPIs. Comparison can be done among peer museums when some basic assumptions and rules about the sample of museums are set up. Following are examples of such rules:

- The sample will contain peer museums of the same type and with similar business models, resources and the context. Your museum is included in the sample of peer museums, appearing near the middle of the sample when sorted by population, budget, or size.
- You and your peer use identical data definitions for all compared data fields and ideally share data for the same year or, at most, one year apart.
- The museum participates in relevant data-sharing systems, particularly those run by the museum associations or the government.
- Enough of your peers have reported these data fields to create a meaningful sample.

The process of comparison of KPIs of a museum to those of its peers is about comparing museum's performance in selected areas of impact and performance to that of its peers. The main purpose of comparison is to find out what a museum does better than the norm, and what a museum could improve. The museum is likely to have lessons to teach, and some to learn. A corollary idea is to establish a positive and collaborative relationship among peers. If the museum is in separate markets, then it is not competing, but helping each other. The museum have a lot to share with its peers, ideally with collective gain over the years, expanding and shifting the membership of the peer group as each museum evolves in purposes and resources (Jacobsen, 2016).

The management approach called appreciative inquiry starts such comparisons on a positive note, asking more about what is going well and how to maximize it than the alternative deficit inquiry model that investigates what is going poorly and focuses on fixing it.

Jacobsen (2016) proposes sixteen steps how to set up peers and how to compare a museum to its peer.

1. First step is a selection of an existing a museum database or creation of a new one. Our museum should participate in this database, submitting our data periodically by their definitions. Some association surveys have limited data, and it is necessary to ask peers to share additional data in return for sharing our compilation and analysis.
2. Identify standard sources of high-quality community and other external data.
3. Establish numerical parameters that bracket our museum's data.
4. Look at the museums on the list, if they are named. Then consider if you think of them as peers. In case the data are anonymized, look for the outliers by finding data points removed from the rest of the cluster.
5. Create other kinds of museum groups for other kinds of comparisons: If our museum is contemplating a significant change, then you may want a second set of museum that are like what you want to become.
6. Circulate a draft list of peer museums to the core team and other knowledgeable about other similar museums. After revisions, additions, and adoption, document the list of peer museums.
7. Import peer museum data already in selected database into an excel worksheet for analysis.
8. Engage other peer museums: establish liaisons and let them know that you are analyzing their data. Agree to send them your comparison tables.

9. Calculate the KPIs for each peer museum: calculate their versions of your selected KPIs, then calculate both the median and the average of the sample, discarding any museums with empty data for a particular KPI.
10. Calculate the individual KPIs, and then average the KPIs. Do not average the data point total of the whole sample and then calculate a KPI using the totals. You want to compare your museum's performance to other individual museums, not to an imaginary combined museum.
11. Determine the median and average of the sample: the median and the average are suited for different applications, but for now, use them as a range. The media is the figure where there are an equal number of museums above and below the figure, whereas the average is the total of the sample divided by the number in the sample.
12. Note the degree of clustering versus divergence and understand the statistical meaningfulness of the sample size: the rule of thumb is that larger sample are more statistically representative, but smaller sample can still be meaningful if the data points cluster closely around the average and median.
13. Compare your KPIs. The mathematical relationship between your KPI and the average or median of your peers' KPIs is your museum's peer performance index (PPI).
14. Research and analyze why your museum might be performing outside peer norms. You may have successes that merit investing in growth and other areas where you have work to do.
15. Study peers' best practices and incorporate lessons learned into planning and implementation. Talk with and visit the best practice museums in the sample. Find out why they are performing better than you are and find out how they do it. Adapt those lessons to your museum's context, and keep your new friends at the best practice museum in the learning loop as you implement changes. See if the changes result in improved KPIs.
16. Share your experiences with the museum field so that your sector and all museums can improve. The museum field is wonderfully collaborative and open to sharing information that will help the whole sector. Just as we can learn from others, so should we teach. This step is about self-improvement modeled and coached by your best practice peers in specific areas, while you offer them your best practices in return.

This process enables a museum to compare itself to its peers in order to see where the museum is performing on par, or above, or below its peers' normal range.

2.7.4 Mission Development

As mentioned previously, for performance measurement, it is crucial to have a mission of a museum. It is important especially for the BSC described in the next chapter. Before a museum decides to monitor and measure its performance, it should first develop a mission, in case it has not had one. The process of developing a mission starts with a question: What is our purpose? Maybe this question may seem simply, but actually it may be hard to provide a comprehensive answer.

As Kotler et. al (2008) says museum mission is significant anchor and must not be too vague, yet it should not be overly confirming or narrow. He also determines the six factors that shape a museum mission:

1. The museum history has to be taken into account, since it has an influence.
2. Another strong influence on a mission is a museum tradition. A museum's founding mission affects mission formulations.
3. Current preferences of museum managers, directors and other staff, sometimes even preference of the leading donors and supporters play a significant role.
4. Of course, the environment in which the museums operates (political, economic, social, and technological) influences its mission
5. Another aspect that strongly shapes a museum mission is resources that a museum uses. The museum's resources make mission feasible and others impractical.
6. In the process of shaping the mission, the museum's distinctive competencies must be weighted. From the definition of museums comes that all museums are collecting institutions. Therefore the one focus of museum has to be related to collections acquisition, collection care and conservation, exhibition, and interpretation.

2.8 Balanced Scorecard

BSC represents a strategic planning and management system used extensively in business, industry, government and non profit organizations worldwide to align business activities with the vision and strategy of the organization.

In the early 1990s, Robert Kaplan and David Norton focused on how to solve a measurement problem of corporations. The dynamics of business were changing rapidly, globalization, customer knowledge, and the rise of intangible assets were all converging to forever change the way business was conducted. Kaplan and Norton discovered that performance measurement systems used by the most of the companies were incapable of providing the information needed to compete in this new knowledge economy. Most of the companies have not changed since the turn of the twentieth century. They relied almost only on financial measures of performance. Kaplan and Norton believed that organizations should attempt the introduction of balance to their measurement systems. Specifically, the historical accuracy and integrity of financial measures must be balanced with the drivers of future financial performance in an attempt to view a wider spectrum of performance and execute strategy. Their radical, simple approach was labeled a Balanced Scorecard and featured measurement in four distinct areas: customer, internal processes, employee learning and growth, and financial. BSC was introduced in 1990 and since it has been accepted by corporations around the world.

“Generally, we can describe the BSC as a carefully selected set of measures derived from an organization’s strategy. The measures selected for the scorecard represent a tool for leaders to use in communicating to employees and external stakeholders, the outcomes and performance drivers by which the organization will achieve its mission and strategic objectives” (Niven, 2011, p. 13) This definition cannot include all what BSC provides. BSC has three main features:

- Communication tool,
- Measurement system,
- Strategic management system.

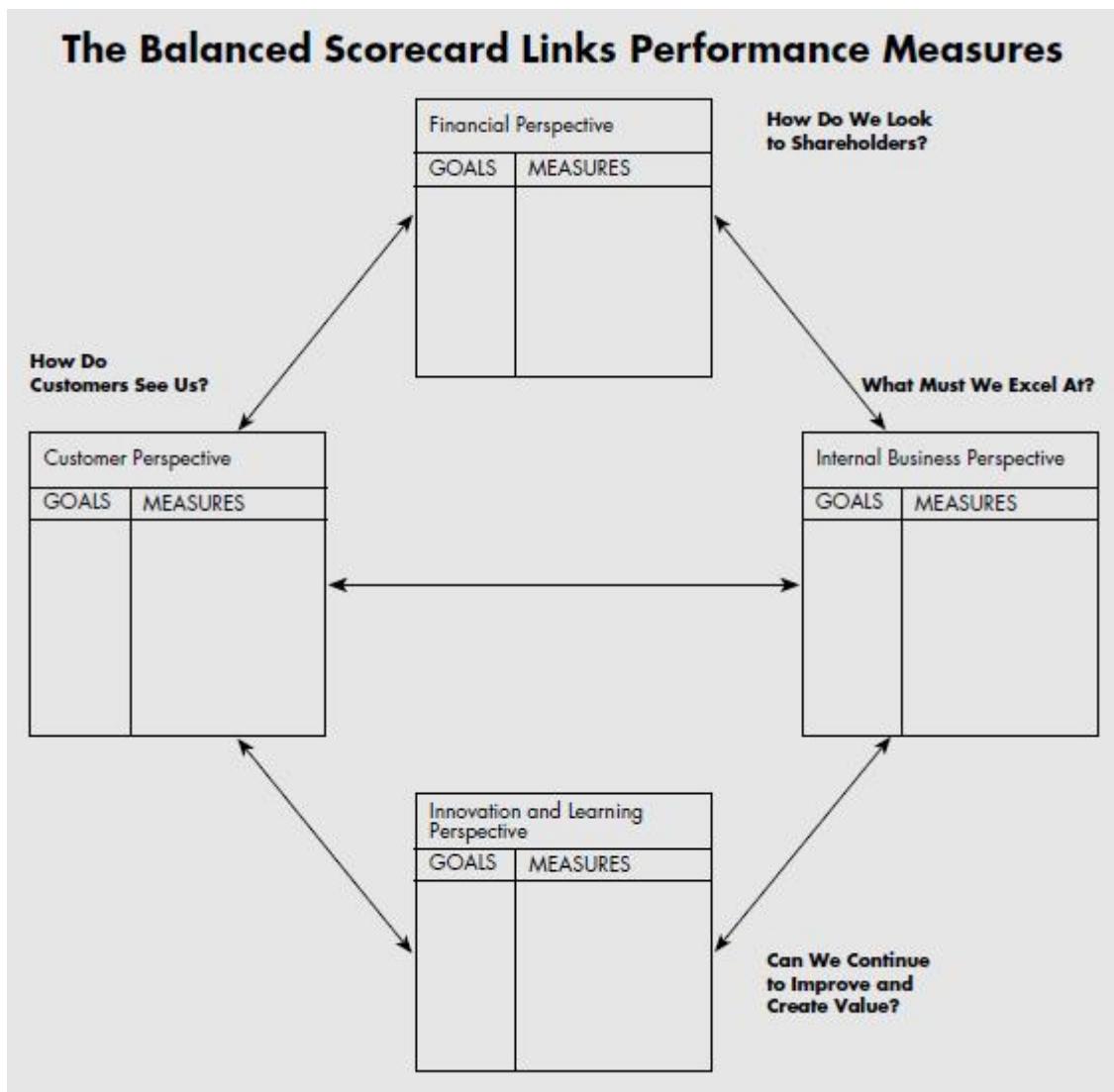
BSC is a set of measures that gives managers a fast, but comprehensive view of the business (Kaplan and Norton, 2005). Kaplan and Norton in the study *The Balanced Scorecard: Measures That Drive Performance* compare BSC with airplane cockpit. For the complex tasks of navigation and flying an airplane, pilots need detailed information about many aspects of the flight, they need information on fuel, air speed, altitude, bearing, destination, and other

indicators that summarize the current and predicted environment. Similarly, the complexity of managing an organization today requires that managers be able to view performance in several areas simultaneously (Kaplan and Norton, 2005). The Figure 13 shows a basic model of BSC and represents that BSC provides answers to four basic questions:

- How do customers see us?
- What must we excel at?
- Can we continue to improve and create value?
- How do we look to shareholders?

While giving senior managers information from four different perspectives, the BSC minimizes information overload by limiting the number of measures used. BSC forces managers to focus on the handful of measures that are most critical.

Figure 13 Balanced Scorecard



Source: Kaplan and Norton (2005)

2.8.1 Perspectives of BSC

As mentioned above and as you can see in the Figure 13, BSC consists of four perspectives. In each perspective an organization needs to determine the goals that organization wants to fulfill, measures how to check these goals, targets and initiatives as shown in the Figure 14. In the middle of the BSC is always vision and strategy of the organization and BSC is the tool that provides framework to translate this strategy into operational terms. Following is a brief description of each perspective.

Customer Perspective

For choosing objectives for the customer perspective, organizations must answer three critical questions:

- Who are our customers?
- What do our customers expect or demand from us?
- What is our value proposition in serving them?

Even if these questions may sound simple, all of them offer many challenges. Many organizations say that they have a target group customer audience, but usually it seems that their strategy is “all things to all customers”. Michael Porter points out that this lack of focus is the reason why some organizations are not able to differ from competitors.

Feedback and communication with audience is crucial for nonprofit organizations. It helps to choose an appropriate value proposition. Value proposition represents how you propose to add value for your customers, what makes you stand out from others. When organizations develop value proposition, many of them would realize that it is difficult if not impossible to focus just exclusively on just one. As Niven (2011) points out, it is more practical to choose one discipline in which you possess particularly strong attributes, and maintain at least threshold standards of performance in the other disciplines.

Internal Process Perspective

In this perspective the aim is to identify the key processes at which the organization must excel in order to continue adding value for customers. The task within this perspective is to identify internal processes and develop the best possible objectives which to execute our strategy. In order to satisfy customers, it is necessary to identify entirely new internal processes rather than focusing an effort on the incremental improvement of existing activities. Service development and delivery, partnering with the community, and reporting are examples of items that may be represented in this perspective (Niven, 2011).

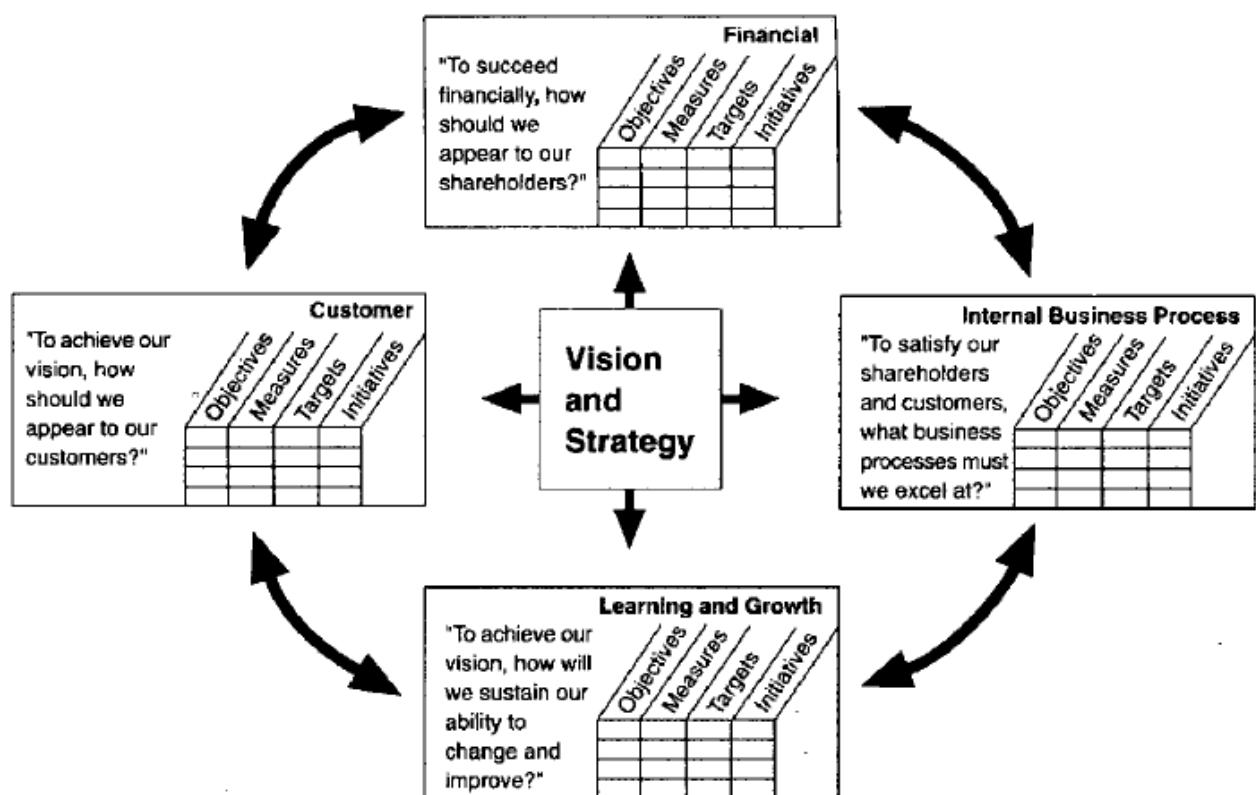
Financial Perspective

Financial objectives are very important component of any for-profit, public and nonprofit organization. In the nonprofit and public sector, financial objectives ensure that we achieve our results, but doing so in an efficient manner that minimizes cost.

Employee Learning and Growth Perspective

If you want to achieve ambitious results for internal processes and customers, where are these gains found? The objectives appearing in this perspective are really the enablers of the other perspectives. Once you identify objectives in your Customer and Internal Process Perspectives, you can be sure of discovering some gaps between your current organizational infrastructure of employee skills, information system, and organization climate and the level necessary to achieve the results you desire. The objectives designed in this perspective should help you to close that gap and ensure sustainable performance for the future.

Figure 14 BSC Provides a Framework to Translate a Strategy into Operational Terms



Source: Kaplan and Norton (1996)

2.8.2 BSC for Nonprofit Organizations

BSC was originally proposed for commercial companies. Later this tool was adapted also to the condition of nonprofit sector. In 2001 Kaplan and Norton published a study Strategic performance measurement and management in nonprofit organizations, where they introduced

the BSC for nonprofit organizations. Kaplan and Norton (2001) in this study show that success of nonprofit organization should be measured by how effectively and efficiently they meet the needs of their constituencies. Financial considerations can play an enabling or constraining role but will rarely be the primary objective. Financial reports have many limitations, for example, they measure past performance, but say only little about long-term value creation. For profit-seeking companies, the financial perspective provides a clear long-run objective, but it provides a constraints rather than an objective for nonprofits, although these organizations must certainly monitor their spending and comply with financial budgets, their success cannot be measured by how closely they keep spending to budgeted amounts, or even if they restrain spending so that actual expenses are kept well below budgeted amounts (Kaplan and Norton, 2001).

Nonprofit have difficulty in clearly defining their strategy. The problem is that vision and mission of nonprofit organizations very often consist of lists of programs and initiatives rather than the outcomes the organization that the organization is trying to achieve. After, when such organizations decide to implement a performance measurement system, they typically measure progress in achieving milestones on their initiatives, which is backwards. Initiatives should exist to help the organization achieve its strategic objectives, they are means, not ends. Strategy and performance measurement should focus on what output and outcomes the organization intends to achieve, not what programs and initiatives are being implemented. Another problem is that many strategy documents represent a combined wish list from all the participants invited to engage in the strategy-setting process. Nonprofit organizations, in particular, value employee participation (Kaplan and Norton, 2001).

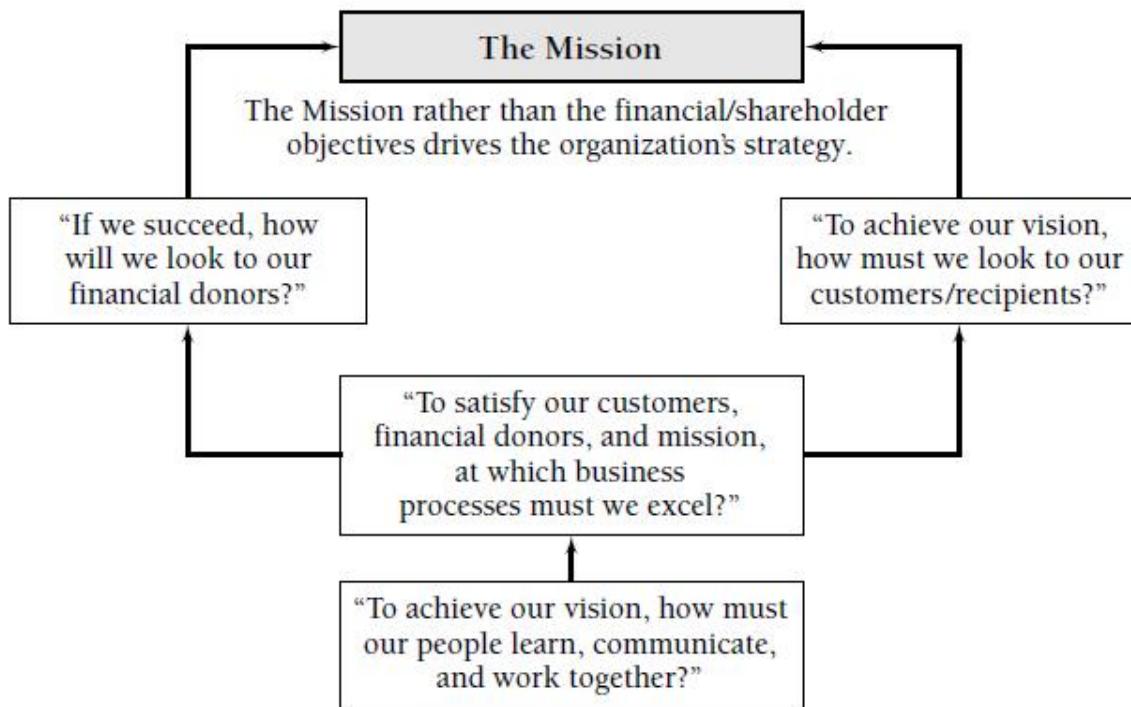
The start of any performance measurement system has to be clear strategy statement. Otherwise, performance measures focus on local operational improvements rather than on whether the strategy is being achieved.

Most nonprofit organizations have difficulty with the original architecture of the BSC, which placed the financial perspective at the top of the hierarchy. Many nonprofit organizations have rearranged the geography of their BSC to place the customer perspective at the top. Actually, nonprofit organizations should consider putting an overarching mission objective at the top of their scorecard as shown in the Figure 14.

Also for nonprofit organizations it is crucial to be aware of what are their customers. There is an important difference between profit and nonprofit companies related customer perspective. In a private sector, customers both pay for the service and receive the service. But in a

nonprofit organization, donors provide the financial resources, they pay for the service, whereas another group, the constituents, receive the service. Who is the customer, the one paying or the one receiving? Rather than making such a decision, organizations have placed the donor perspective and the recipient perspective in parallel, at the top of their BSC as can be seen in the Figure 15.

Figure 15 Adapting the BSC Framework to Nonprofit Organizations



Source: Kaplan and Norton (2001)

2.8.3 Case Studies of Application of BSC in Museums

After introduction of theory of BSC and its evolution, now I analyze some case studies of application of the BSC in museums. Through these examples you will see that BSC has been adopted not only with different perspectives and specific to each museum organization, but its used has been restricted to assessment of specific activities

2.8.3.1 The Benaki Museum

The Benaki Museum is situated in Athens in Greece and operates as a foundation under Private Law. The museum was founded in 1930 and nowadays it collects, exhibits and protects prehistoric artifacts in six buildings. The museum was founded as a private foundation and from financial point of view it has always strongly depended on donors and contributions that have gradually decreased with the economic crisis. These conditions forced the management of the museum to do some changes in order to survive. A deep analysis discovered a number of challenges. First of all, they clarified vision and mission of the museum. Part of this change was the adaptation of the BSC in 2012 that was specially created for the museum by The Boston Consulting Group. This model of the BSC is structured in the following four perspectives: the artistic contribution, public benefit, learning and growth, finance and governance. Each perspective is associated with the strategic objectives and indicators to measure performance. The Benaki Museum had to manage its costs more closely and strengthen its approach to governance, while empowering more of its employees. The BSC seemed as an appropriate tool because it provides clear targets to drive greater transparency and accountability, it also encourages greater entrepreneurship, creativity, and initiative among employees (Egloff and Zorloni, 2012). As you can see, four perspectives of the BSC for the Benaki Museum have been modified. First perspective, called Artistic Contribution includes collections, intellectual capital, and brand. Typical performance metrics within this perspective include percentage of works on display, the number of pieces on loan to other art museums, the number and quality of institutions to which the museum has lent art and artifacts, the number of pieces purchased in the last year, and the percentage of permanent collections acquired and catalogued. Since research is important part of the museum's activities, this dimension includes also metrics such as the number of articles published by museum staff in scholarly journals or the number of collections catalogues published by the museum.

Second perspective proposed by the Boston Consulting Group is called Public Benefit. For museums in general, it is crucial to have a strong relationship with the public and develop this

relationship by offering programs and visitor services, by providing positive experiences, and by preserving collections for future generations. Performance within this perspective could be measured by metrics such as the range and variety of programs offered, the percentage of the museum's budget devoted to marketing, the percentage of return visitors, the increase in first-time visitors, and the number of schoolchildren who visit per year.

The third perspective, Learning and Growth, is about an analysis whether the museum is a place where employees can flourish. Employees are of course critical element of every organization. A good organization provides an environment, that encourages development and provide opportunities for professional and personal growth. This is especially important in the long run. Typical metrics in this perspective are the percentage of the museum's budget dedicated to training and career development, the percentage of satisfied employees, the use of 360-degree feedback to evaluate staff performance, and the degree to which employees are involved in the museum's governance.

The last but not least is the perspective of Finance and Governance. This perspective analyzes how well-run and financially sustainable is the museum. The task of a cultural organization is to use its resources efficiently and effectively to achieve the trust of the public. Moreover, the finance of a cultural organization must be transparent and the governance organization must be accountable. Performance in this perspective can be measured through metrics such as the ability to meet fundraising targets, balance the operating budget, and meet revenue targets through diversified sources such as admission shop and restaurant sales, and special invents. The proper metrics, set performance targets, define specific initiatives for achieving those targets, and then closely monitor results (Egloff and Zorloni, 2012).

The BSC has allowed the Benaki Museum to have a complete overview of the performance of the activities undertaken in the museum. From an artistic perspective stakeholders can discover that the museum in his six buildings accommodates 84.946 works of art. The complex also includes four active archives with 130.000 volumes. The museum publishes 20 catalogues per year and 427 publications. The Benaki Museum organizes approximately 30 exhibitions every year and borrows 1.500 artworks to other museums. In addition, 1.000 copies of the magazine published by the museum are widespread in Greece and abroad.

From the public benefit perspective, we can read that the museum organizes approximately 350 cultural events every year such as conferences, presentations, discussions, theatre and dance performance, concerts, screenings and press conferences. The Benaki Museum is the second most visited museum in Greece and every year welcomes 350.000 visitors. The

museums also organized successful education programs that are visited by 22.000 children and adults. In addition, satisfaction rates are very high, 95 % of the public is satisfied and even the critics have given a 90 % positive response (Violino, 2015).

Analyzing the results of the learning and growth perspective emerges that the Benaki Museum involves seven mid-level employees in prestige international conferences and seminars and organizes two annual meetings for information communication with the staff. In order to improve the internal communication, the museum decided to install in each building dashboard containing all information about museum's program, activities and performance, also information from curators, employees' ideas, and fundraising progress. The Benaki Museum also made sure itself that all employees are familiar with the museum's mission and vision, what they are expected to do and reach and how they can be involved in the changing process.

Finally, the results in the finance and governance perspective showed that fundraising activities need to be change through individual and corporate programs. The museum decided to hire a fundraiser with the aim to increase revenue. As the first achievement the museum considers a new fundraising campaign that provides customized packages for companies and individual donors. A financial manager of the museum introduced a new system of budgeting and control system with the goal of managing cost with the higher transparency. With the financial control, higher revenue from fundraising, admission, restaurant and museum shop the museums have been building sustainable development for the future.

The Benaki Musem uses BSC as a tool for its management, evaluation but also as a communication tool towards all stakeholders. You can see the BSC of the Benaki Museum in the Figure 16.

Figure 16 BSC in the Benaki Museum

Benaki's Scorecard Addressed Four Dimensions			
Artistic Contribution		Public Benefit	
6 museum buildings, 1 under construction, 4 active archives	84,946 artworks—from the Stone Age through 2012	350 cultural events each year—conferences, presentations, theatrical and dance performances, concerts, movies, and press conferences	
1,500 artworks travel around the world each year, strengthening Benaki's bonds with other museums	130,000 volumes in the largest museum library in Greece	350,000 visitors each year, making Benaki the second most visited museum in Greece	22,000 children and adults participating annually in educational programs
1,000 copies of Benaki's annual magazine are distributed in Greece and abroad	More than 30 temporary exhibitions in the museum spaces 20 new books each year; 427 existing publications	90% of critics' reviews were positive	95% satisfaction ratings by visitors
Learning and Growth		Finance and Governance	
7 museum employees participated in high-profile international conferences and seminars	To boost team dynamics, all main buildings are equipped with the museum's information scoreboard	3 museum shops promote top-quality replicas and new artists' designs	
2 annual information-sharing meetings for all staff		The 2 cafes—in Koumbari and Piraeos—have a reputation for good food and a pleasant environment	Fundraising activities have been relaunched—corporate and individual programs—online too

Source: BCG analysis (2012)

2.8.3.2 Tate Gallery

The analysis of the use of BSC in Tate Gallery allows us to analyze a case of application of the BSC to a specific area of museum activities. Elena Villaespesa (2015), who is in charge of the digital area of the museum has decided to adopt the BSC as a tool for measuring value and impact of social-media activities.

Social media offers nowadays the ability to communicate and interact directly with their audiences. For last decades museums have been developing digital interactive project in order to involve the audience. But with this trend, the question of measurability of the impact and value of social-media activities has risen. The number of followers has limited capability in measuring success (Villaespesa, 2015).

The starting point for this application of the BSC was of course again the clarification of the mission and strategy. The objectives of Tate Gallery that should be reached through social media are increase knowledge, understanding and enjoyment of art from sixteenth century to the present, and also to provide a place for exchange and share between wide public and experts. The vision was to become an open international institution that is sustainable. The way how to achieve these goals was to offer an excellent and varied program of events, both physically and in online galleries. The aim was to point out the loyal audience, but also to attract new one (Violino, 2015).

Figure 17 State of the Different Organisational Elements in 2013 and the Plan for 2015

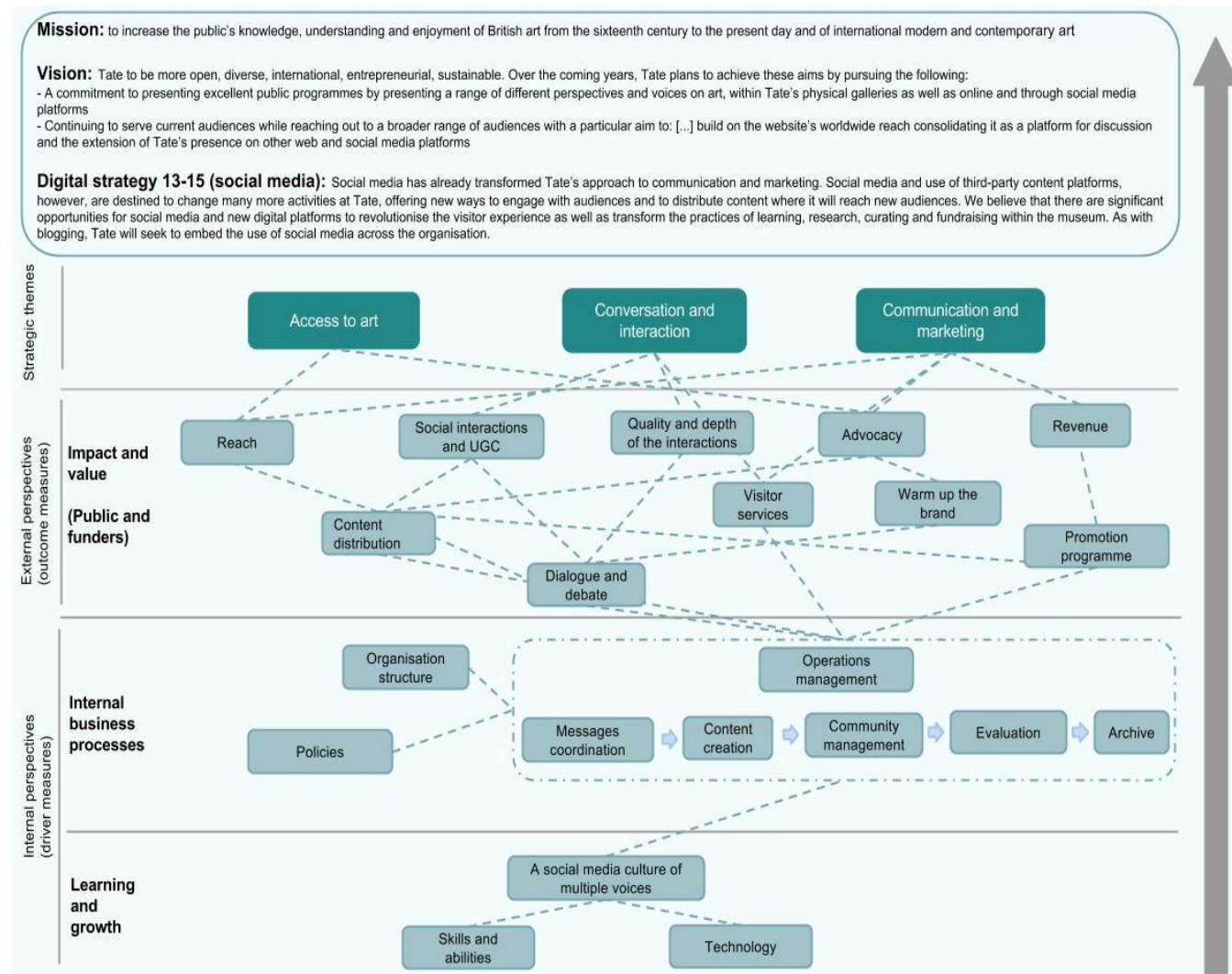


Source: Villaespesa, (2015)

Villaespesa summarized in the Figure 17 the state of the maturity of different organizational aspects in 2013 in relation to social media and also how they will be in 2015. Tate needs to measure how this evolution is taking place and the external impact that these changes will have on the public (Villaespesa, 2015).

Then it was necessary to translate the strategy into specific objectives. In order to do so, a strategy map was used. Through this map the key factors of success were identified, shown in the Figure 18. The map shows the activities and results that need to be measured, and also represents the links between them and how they create value for the public. Each perspective of the BSC and key success factor is explained along with the measures selected are explained with the diagram (Villaespesa, 2015). At the top of the BSC, the Tate Gallery put the perspective of the growth and learning. Training staff and enhance their culture in terms of social-media is considered as a key success factor for the evolution towards an organization with a digital culture. The main objective in this perspective is therefore to increase the skills and abilities of the staff and this achievement is measured by calculating the percentage of attendance to training courses and the hours devoted to them.

Figure 18 Strategy Map for Tate's Social-Media Activities



Source: Villaespesa (2015)

Following is the perspective of internal processes. The main objective in this perspective was to increase the efficiency of management and this objective is measured by evaluating the transversal work between the departments, the amount of content published by platform, the number of responses given by staff to its online content, the number of searches and the evaluation report, the amount of stored content. Additional objectives were to implement the control policies of the adoption of the guidelines defined in the use of social media. This was measured by calculating the number of active people in the community and the amount of shared best practices. These measures were intended to assess the changes in the organization and the status of implementation of the new media culture. Data were also collected through interviews to assess staff awareness on the strategy and online activities (Violino, 2015).

Finally, there is the external perspective that observes the impact of the museum and the value created for the public. Each platform and account has different specific objectives, but there

are the key objectives that are globally important such as access to the art, conversation and interaction, marketing and communication. Access to art and the collections of the Tate Gallery is clearly facilitated by social media because it is able to reach a wide audience by distributing the content beyond the gallery. Through videos, blog and media it is possible to use the collections and expand the audience. The performance indicators here are the amount of type of users reached, the differences that characterize them, the display content and the online traffic to blogs, video, images, etc. The conversation and interaction are important to create a dialogue. This is measured by the interaction rate, frequency of interaction, number of comments and replies. All measures can be found in the Figure 19.

Communication and marketing is made through social-media channels like Facebook, Twitter, and Google+. Through these channels the museum promotes the exhibitions and events program. The social-media communication strategy lists these objectives: bring direct traffic to the website, distribute content, increase awareness of key messages, integrate social-media channels into the marketing campaigns, generate advocates and partnerships to increase online following, and generate revenue and footfall to the gallery (Villaespesa, 2015).

All measurements used in the external perspective evaluate the impact on users and requires an approach combining quantitative indicators (number of likes, followers, comments, web site traffic) and qualitative (looking at the type of content and its relevance, etc.) (Violino, 2015).

Figure 19 shows the BSC for Tate with set measures for each objective identified and also you can see there the methods how to collect data and how to analyze them. After the framework is set, then it is necessary to put this framework into action, assess its usefulness, and analyze the insights and challenges that stem from applying it (Villaespesa, 2015).

The effective application of the BSC to the various social media channels implies the need to respond to the multiple managers' needs, enhancing information and grades for each different and specific detail. Then it is clear that you need different types of reports and dashboards, at different levels, to respond adequately to the needs for information. Three dashboards have been developed for this. The first one is a strategic dashboard that contains all the key performance indicators of social media, providing an overview of global trends and monitoring of all activities. The second dashboard is more tactical and operational, related to the specific departments and objectives. The third one studies a particular activity.

Figure 19 Balanced Scorecard for Tate's Social-Media Activities

OBJECTIVES	MEASURES	METHOD	INITIATIVE
Learning & growth			
Create a social media culture of multiple voices	Culture change Number of accounts (number of individuals, by activity, by audience, by department) People in the social media group, authoring blog content (informal) or with social media tasks in their job descriptions (formal) Number of social media projects	Social media platforms list Social media group members list / Job descriptions Social media plan Staff surveys, focus groups or interviews	Training programme, performance reviews, formalise tasks in job descriptions, communication
Increase staff skills and abilities	% Staff attended sm training course Number of hours of sm training in this period	Training records Training plan	
Provide tools and technology to work on social media	% computers with social media tools/ number users with accounts on these tools	IT records/SM tools users list	
Internal business processes			
Implement guidelines and policies	% published guidelines, adoption and milestones	Internal comms channels Staff surveys, focus groups or interviews	Digital Handbook (social media policies and guidelines: editorial layered control, moderation, safeguarding, digital asset management)/ Improve evaluation work / creation of networks / Standard processes and internal comms channels
Increase efficiency in the operations management (message coordination, community management, evaluation, archive)	Cross-department work Amount of published content (per platform) Number of staff responding to their own content (eg. blog comments by the author) Number of research and evaluation reports in this area Amount of archived content	CMS, social media sites Social media group members list Job descriptions Internal comms Archive records	
Establish a governance and organisation structure	Number of people in the social media/community network Amount of best-practice sharing	Milestones Internal comms channels	
Public & funders			
Access to art	- Reach a wider audience - Distribute content	Reached users, size of the community, impressions New users Diversity of audiences Content views on social media Traffic from social media to the collection, blogs, videos or other type of content	Social media platform and website analytics tools (e.g. Facebook Insights, Twitter Analytics, Google Analytics)
Conversation and interaction	- Increase interaction - Generate dialogue, debate and interaction about art	Interaction rate, frequency of interaction, volume user-generated content Number of comments and replies, message direction, on-topic responses, length of comments, sentiment, tone, quality of the interaction	Social media platform analytics tools Social media platform analytics tools / Content, linguistic, sentiment analysis
Communications and marketing	- Generate revenue - Warm up the brand - Get advocacy from followers - Create awareness of the programme - Visitor services	Total revenue / Conversion rate Changes in brand perception Share of voice and attention Number of shares, recommendations, mentions Percentage of people aware of the programme via social media channels Number of enquiries responded on social media	Ongoing activities on the website and social media platforms Interactive participatory projects

Source: Villaespesa (2015)

2.9 Data Envelopment Analysis

As mentioned above, there has been increasing pressure in our society to implement transparency and consistency. The methods described in the previous chapters focus on assessing the performance of museums using separate individual performance indicators. As discussed already, single performance indicators have some limits especially they are not appropriate for benchmarking. The idea of comparison of an organization with its competitors has become increasingly central for many organizations, in particular in order to identify the best practice in the industry and also for the improvement of individual performance. The DEA is a tool developed exactly for this purpose. DEA is a linear programming-based technique for measuring the performance efficiency of organizational units which are termed Decision Making Units (DMUs).

In 1957, M. J. Farrell, in the article “*The Measurement of Productive Efficiency*” proposed to measure the efficiency of an organization in connection with an efficient frontier of production. He distinguished that the efficiency of a firm consists of two components:

- Technical efficiency that reflects the ability of a company to obtain maximum output from a given set of inputs.
- Allocative efficiency which reflects the ability of a firm to use the input in optimal proportions, given their respective prices and the production technology.

These two measures are then combined to provide a measure of total economic efficiency.

Generally speaking, the DEA aims to measure how efficiently a DMU uses the resources available to generate a set of outputs (Charnes et al. 1978). The performance of DMUs is assessed in DEA using the concept of efficiency or productivity, which is the ratio of total outputs to total inputs (Ramanathan, 2003).

The milestone in the efficiency measurement came in 1978, when Charnes, Cooper and Rhodes resumed the consideration on the efficient frontier of Farrell and introduced the DEA methodology. The DEA is an operational research method that can evaluate the relative efficiency of a given homogenous sample of production units, identify sources of inefficiency, classify the decision units in efficient and inefficient and propose to the management a reallocation method. The goal of the DEA is to calculate an index of efficiency of each DMU and comparing it with other units. For each DMU is considered an objective function and a weighting of the input and output of all specific, so each production unit can choose the weights associated with the input and output in an optimal way to maximize its efficiency.

Efficiencies estimated using DEA are relative, that is, relative to the best performing DMU. The best-performing DMU is assigned an efficiency score of unit or 100 per cent, and the performance of other DMUs vary between 0 and 100 per cent relative to this best performance (Ramanathan, 2003).

The very basic efficiency measure used in DEA is the ration of total outputs to total inputs:

$$(2) \text{ efficiency} = \frac{\text{output}}{\text{input}}$$

Let me show you this concept with a simple example. In the Table 1 we have four museums (A, B, C, D) and we consider one input and one output. Efficiency for each museum is counted based on the formula above. We can see that the best performing museum is the museum A with the efficiency index 0,209.

Table 5 Simple Example of DEA

Museum	Input 1	Output 1	Efficiency
A	8,6	1,8	0,209302
B	2,2	0,2	0,090909
C	15,6	2,8	0,179487
D	31,6	4,1	0,129747

Source: Author

Table 6 Simple Example of DEA – Relative Efficiency

Museum	Efficiency	Relative Efficiency (%)
A	0,209	100
B	0,091	43,4
C	0,179	85,6
D	0,13	63,1

Source: Author

DEA is a tool for a relative efficiency. Then the best performing, so the most efficient museum has 100 % of relative efficiency. Relative efficiency of other museums is counted as the ratio of their efficiency to the efficiency of the best performing unit.

$$(3) \text{ Relative efficiency of museum B} = \frac{0,091}{0,209}$$

$$(4) \text{ Relative efficiency of museum C} = \frac{0,179}{0,209}$$

$$(5) \text{ Relative efficiency of museum D} = \frac{0,13}{0,209}$$

A fundamental assumption behind the computation of relative efficiency is that if a given museum A is capable of producing Y(A) units of output using X(A) of inputs, then other museum should also be able to do the same if they were to operate efficiently (Ramanathan, 2003).

It is possible to set a performance target for inefficient museums to enable them to reach 100 per cent relative efficiency in comparison with museum A, the most efficient. We consider that museum A is operating in an environment similar to the others and hence using its performance as a benchmark is realistic. Input target for museum B is the amount of capital employed that will enable the firm to have the same ratio of value added to capital employed as museum A. Input target is counted as following:

$$(6) \text{Input Target} = \text{Actual Input} * \text{Relative Efficiency}/100$$

For museum B:

$$(7) \text{Input Target (museum B)} = 2,2 * 0,434$$

$$(8) \text{Input Target (museum B)} = 0,955$$

This for example means that if museum B operates using 0,955 million CZK as input and produce 0,2 million CZK as value added output, then it will be considered as efficient as museum A. For inefficient museums, input target is less than the actual input. The difference between actual input and input target is called Input Slack. For museum B it is as following:

$$(9) \text{Input Slack (museum B)} = \text{Actual Input} - \text{Input Target}$$

$$(10) \text{Input Slack (museum B)} = 2,2 - 0,955$$

$$(11) \text{Input Slack (museum B)} = 1,245$$

Input Slack can be also expressed as a percentage:

$$(12) \text{Input Slack Percentage} = \frac{\text{Input Slack}}{\text{Actual Input}} * 100$$

For museum B

$$(13) \text{Input Slack Percentage (museum B)} = \frac{1,245}{2,2} * 100 = 56,6$$

If museum B has to be as efficient as museum A, it should produce the same output using 57 percent less input. Then we can use the same logic to compute Output Target and Output Slack.

The previous example shows the relative efficiency considering only one single input and one single output. This is definitely not the case of museum, for them it is typical that they use

multiple sources and produce multiple products. Let us now consider a set of museum using multiple input structure to obtain a multiple output structure. We consider a set of n DMUs using a total number m of inputs to provide a total number t of outputs. In order to evaluate the relative efficiency of a given DMU k ($k=1, \dots, n$), we denote by y_{rk} the amount of output r($r=1,2,\dots,t$) from DMU k; x_{ik} the amount of input i ($i=1,2,\dots,m$) from DMU k; u_{rk} the weight given to output r, from the point of view of the DMU k; v_{ik} the weight given to input i, from the point of view of the DMU k. The efficiency measure E_{kk} of the DMU k can be defined as the weighted ratio (Basso and Funari, 2004).

$$(14) \quad E_{kk} = \frac{u_{1k}y_{1k} + u_{2k}y_{2k} + \dots + u_{rk}y_{rk} + \dots + u_{tk}y_{tk}}{v_{1k}x_{1k} + v_{2k}x_{2k} + \dots + v_{ik}x_{ik} + \dots + v_{mk}x_{mk}}$$

The weights in the previous formula are selected so DMU k in its most favorable light. That is, the weight u_{rk} and v_{ik} are those that maximize the efficiency measure E_{kk} , under the constraint that no other DMU j, using the same set of weights, will show an efficiency measure higher than 1. Let us define E_{kj} as the relative efficiency of DMU j when the weighting structure of DMU k is used

$$(15) \quad E_{kj} = \frac{u_{1k}y_{1j} + u_{2k}y_{2j} + \dots + u_{rk}y_{rj} + \dots + u_{tk}y_{tj}}{v_{1k}x_{1j} + v_{2k}x_{2j} + \dots + v_{ik}x_{ij} + \dots + v_{mk}x_{mj}}$$

There are various DEA models proposed in the literature over the past decades.

2.9.1 CCR Model

Model CCR was proposed by Charnes, Cooper and Rhodes (1978). The main feature of this model is that it considers a situation of constant return to scale. CCR model is the most basic model of the DEA methodology. In this model we form virtual input and virtual output. In DEA, multiple inputs and outputs are linearly aggregated using weights. Thus the virtual input of a museum is obtained as the linear weighted sum of all its inputs. Mathematically:

$$(16) \quad \text{Virtual Input} = \sum_{i=1}^I u_i x_i$$

Where u_i is the weight assigned to input x_i during the aggregation, and u^30 . Similarly, the virtual output of a museum is obtained as the linear weighted sum of all its outputs.

$$(17) \quad \text{Virtual Output} = \sum_{j=1}^J v_j y_j$$

Where v_j is the weight assigned to output y_j during the aggregation, also v^30 .

Then the efficiency of the DMU in converting the inputs to outputs can be defined as the ratio of outputs to inputs.

$$(18) \text{ Efficiency} = \frac{\text{Virtual Output}}{\text{Virtual Input}} = \frac{\sum_{j=1}^J v_j y_j}{\sum_{i=1}^I u_i x_i}$$

There are two versions of the CCR model. The first one aims to minimize inputs while satisfying given output levels, this version is called input-oriented model. The second one is called output-oriented model that attempts to maximize outputs without requiring more of any of the observed input values. Also, these two versions can be combined (Cooper et. al., 2006).

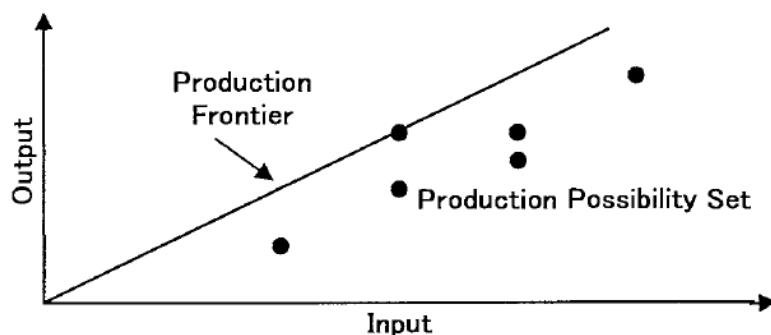
2.9.2 The BCC Model

Since the beginning of DEA studies, various extension of the CCR model have been proposed and the BCC (Banker-Charnes-Cooper) is one of them. The BCC model has its production frontiers spanned by the convex hull of the existing DMUs. The frontiers have piecewise linear and concave characteristics lead to variable return-to-scale characterizations with:

- a) Increasing returns-to-scale,
- b) Decreasing return-to-scale,
- c) Constant return-to-scale.

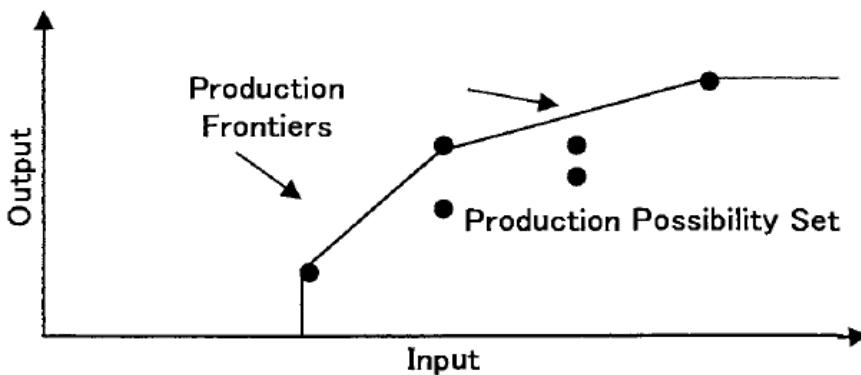
Figure 20 and Figure 21 show the different between the CCR and BCC models.

Figure 20 Production Frontier of the CCR Model



Source: Cooper et. al. (2006)

Figure 21 Production Frontiers of the BCC Model



Source: Cooper et. al. (2006)

2.10 Integrated Model BSC – DEA

In the previous chapter I have introduced two different managerial tools that have proved to be useful for performance assessment. The important facts are that those two tools are different, the BSC is useful for performance measurement mainly for the institution itself and DEA methodology is useful for benchmarking and efficiency measurement. Nowadays many institutions have been forced to increase their quality and efficiency, therefore they should get familiar with the tools allowing them to assess their activities, impact and performance. The strong aspect of this pressure is the comparison with the optimal standards, which are set related to the best practice. But here the important and complex questions arrive: What is the best practice? How does one recognize the best?

As I mentioned, BSC and DEA are different useful tools, but they both have their limits that do not allow to fully understand that organization is the best. BSC is a tool that includes many indicators, goals and provide managers with an overall vision of an institution. Considering multiple dimensions, the difficulty is related to the fact that an institution rarely excels in all its dimensions, in all four perspectives. That way BSC is build for individual institution and it is very complicated to use it as a tool for comparison. In order to overcome these problems, many scholars have proposed to integrate BSC with other methods, including DEA. As we have seen already, DEA is instead an operational research tool used in order to calculate the relative efficiency of various production units, based on the observation of specific input and output. It provides efficient target and showing how efficient an institution is.

There have been few studies with the combination BSC and DEA, but to my knowledge, there have been only one study dedicated to the field of culture. The idea of integration BSC and

DEA allows both methods to make up for each other's weaknesses, and creating more complete and powerful evaluation system.

Kadarova et. al. (2014) lists the most significant differences between these two methods, that are shown in the Table 7.

Table 7 Proposed Differences Between DEA and BSC Method

Characteristics	BSC	DEA
Way of comparison	comparison with an ideal virtual unit	proportional comparison of the same units
View-rating	multiple view - perspectives	input / output
Mathematical ranking	weak	strong
Application	performance evaluation	technical efficiency
Accuracy of measurement	unclear	high
Presentation of opportunities for improvement	weak	high
Variety of sustainable results	does not support	has
Future view	has	does not have
Relationship to business strategy	has	does not have

Source: Kádárová J., Durkáčová M. et al. (2014, p.1506).

This comparison shows that BSC and DEA are able to compensate weaknesses of each other. The BSC, used individually, can include a large number of variables, and defining a hundreds of success factors. BSC does not have a system of weight or a firm mathematical basis. Therefore it is really difficult to use it for benchmark and is complicated to objectively highlight the inefficient use of resources. These are reasons why the DEA support becomes essential. DEA is suitable for measuring the efficiency based on of the BSC indicators. On the other side, the DEA methodology provides the efficiency of a DMU and tends to discover the strengths and weakness factors and efforts of individual processes. The multiple inputs and outputs of the DEA are in fact collected and organized in a framework of the four perspectives of BSC.

The integration makes measuring the efficiency of the BSC indicators short as possible. The first step of the integration starts usually with qualitative approach of BSC. Then the DEA intervenes to measure the border of relative efficiency of DMU. It requires and provides quantitative data. That way the integration generates a new instrument, together qualitative and quantitative, that supports management at all levels by monitoring the performance and processes. The objective and benefits of the integration are manifold, but Kádárová et al. (2014) distinguish three main benefits:

- First, the integration facilitates the achievement of performance targets or strategic objectives clarified by the BSC.
- Second, the integration allows to optimize the use of inputs to generate desired outputs.
- Third, it identifies cause and effect relationship and balance between the different aspects of the business.

Performance and effectiveness management of business processes is in BSC-DEA model ensured by (Kádárová et al., 2014):

- With the adaptation of BSC company receives very good and clear view of the company as a whole, as fulfilling its strategic objectives, how the processes are working and what causes variation in their performance and success.
- The applying the principles of DEA method is measured the effectiveness of the company and its core processes, based on KPIs analyzed using the BSC.

Rouse et al. (2002) were the first who concentrated on the existing potential in integration of DEA in performance evaluation framework of BSC. Richard (2003) used DEA in four perspectives of BSC. This study used the DEA methodology and Malmquist indices for assessing the efficiency and productivity of the DMU. The sources of inefficiency are then classified by the integration in a pyramid of perspectives of BSC. Since there have been several studies, for example the analyzes in the banking sector: Chen T.Y. et al (2008), Macedo et al. (2009), Khakia et al. (2012).

On this line, many scholars recover and sometimes readjust this system. There have been, for example, the analyzes in the banking sector: Chen T.Y. et al. (2008) in the United States, Macedo et al. (2009) in Brazil, Khakia et al. (2012) in Iran. The real milestone within the integration of BSC and DEA that allowed to really show the potential of integration happened with the research of Eilat et al. (2008) and García-Valderrama et al. (2009). Eilat et al. (2008) wanted to overcome traditional restrictions on the flexibility of the DEA weights. So he wanted to propose a method that balanced the importance of each card or group of measures structuring them hierarchically. They presented a model that integrates the structure of BSC in the DEA through balanced constraints. The four dimensions of BSC traditionally considered within the company, they added uncertainty perspective, which considers the probability of technical and commercial success. They preferred to adopt the CCR model with constant returns to scale.

García-Valderrama et al. (2009) worked with five of DEA efficiency models to empirically evaluate the relationships between the perspectives of BSC. In the various models, indicators of perspectives are used alternately as input or output, finally providing a summary of the

final analysis of the work. The first model uses as input and output indicators of the customer's perspective and those of the financial, the second to the innovation perspective and the customer, the third those of the perspective of internal processes and innovation, the fourth those of the perspective of learning and growth and internal processes, fifth those of the learning perspective and growth and financial position. All results are highly correlated with each other and so the authors can identify trade-offs and make the relations between the perspectives of BSC.

Basso et. al. (2015) in their study *How well is the museum performing? A joint use of data envelopment analysis (DEA) and balanced scorecard (BSC) to measure the performance of museums* proposed the integrated BSC-DEA model to assess the efficiency of the set of 19 museums. They proposed a comprehensive model for BSC and set the indicators for each of four perspectives of BSC. The second step was to reduce a set of indicators in order to use them as inputs and outputs for DEA methodology. The comprehensive model and reduced model you can see in the Table 8. In the second stage, they used results from each perspective as outputs for DEA methodology. The second stage aims to synthesise the indications of performance in a comprehensive indicator.

Table 8 Input and Output Variables of the BSC-DEA Models

FIRST STAGE DEA MODELS	<i>Comprehensive model</i>	<i>Reduced model</i>
Customer perspective	Input variable: Insured value Output variables: 1. Visitors 2. Web site visits per visitor 3. Members 4. Donations 5. Catalogues per visitor	Input variable: Insured value Output variables: 1. Visitors 2. Web site visits per visitor 3. Members
Internal process perspective	Input variable: Total costs Output variables: 1. Conservation and restoration costs 2. Amount spent for new acquisitions 3. Visitors	Input variable: Total costs Output variables: 1. Conservation and restoration costs 2. Visitors
Innovation and learning perspective	Input variable: costant Output variables: 1. Innovative lighting 2. Environmental sustainability 3. Facilities for people with disabilities 4. Personnel training	Input variable: costant Output variables: 1. Aggregate sustainability indicator 2. Personnel training
Financial perspective	Input variable: Expenditure Output variable: Income	Input variable: Expenditure Output variable: Income

Source: Basso et. al. (2015)

3. RESEARCH METHODOLOGY

3.1 Introduction

According to Creswell, qualitative research is exploratory and useful when important variables are not examined (Creswell 2002). In contrast, quantitative approaches emphasize measurement and analysis of the causal relationship between variables, as opposed to presses. But qualitative and quantitative approaches should not be viewed as polar opposites. Then there is also mixed method research, which resides in the middle of quantitative and qualitative approaches, and it incorporates elements of both of them. (Creswell 2002, p. 3)

Creswell see the distinction between qualitative and quantitative research in terms of using words in the case of qualitative research rather than numbers in the case of quantitative research, or using closed-ended questions (quantitative hypotheses) rather than open-ended questions (qualitative interview questions). A combination of qualitative and quantitative methodologies can draw on the strengths and minimize the weaknesses of each research paradigm. Specially, a qualitative approach is feasible when one needs to identify performance measurements small and medium organizations. But on the other hand we have to consider, that the qualitative research alone has limited value. Hence, a mixed research method is employed in this research, which benefits from both qualitative and quantitative approaches.

3.2 Qualitative Research

The main goal of qualitative research is to identify the characteristics and structure of phenomena. These characteristics are then put together in order to form a mini theory or a conceptual model. For qualitative research we need to have an open attitude especially in order to understand how others experience their situation.

Within my qualitative research I have been making an attempt to understand a reality of art museums and phenomena of performance measurement of art museums from the perspective of a researcher. I have tried to grasp this issue from the inside out. I have not started the research by means of theoretical notions, or a model or concepts that need to be tested, but with several sensitize concepts, which are pre-theoretical and are intended for observations. The reason for this attitude was in particularly my assumption that theoretical knowledge about performance measurement is incomplete, insufficient and ineffective, especially in the

Czech Republic. This systematic search for the unknown has been conducted in order to achieve knowledge and experience of the others.

In order to conduct my research activities and justify the results, I have decided to do so through a mixed research methods. The objective of qualitative research is to search and develop a theory and conceptual model. Of course this search has been theoretically driven.

Within the qualitative research I have been working on the basis of open questions. These questions have arrived continuously with the study of literature. The **Chyba! Nenalezen zdroj odkazů**. represents the qualitative research process, when main questions were developed after the literature review. These questions were asked during the interviews and after based on the information from the interviews a model was developed.

Figure 22 Process of Qualitative Research



Source: Author

Actors approach has been used for the qualitative research it means that I have gathered knowledge and data about performance measurement in art museums through the eyes of experts and people involved in this phenomenon. This basic approach assumes that the researcher cannot be an objective outsider, the researcher is involved with both his own research and the phenomena that are being examined.

3.2.1 Qualitative Methods

During my research I have developed a preference for the research methods that is described on the following paragraphs. In general, there are three examples of qualitative methods:

- Grounded theory approach,
- The chain reasoning approach,
- Action research.

For my research I have employed the grounded theory approach, which aims at developing a theory that is grounded in practice. Theory is developed during data collecting and subsequently coding the material. The data material is used to search for categories, characteristics of these categories and relationships between them. This is based on the principle of continuous comparison (Jonker and Pennink, 2010).

Central to grounded theory is the development of a theory that is grounded in the local reality of the situation that will be investigated. In my research, it is a reality of art museums in the Czech Republic, but with the experience and knowledge from foreign studies and from interviews with experts abroad.

It is highly recommended to use triangulation within grounded theory, therefore I use triangulation described later.

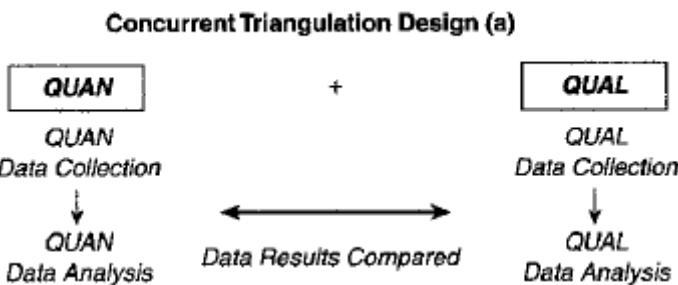
3.3 Research Strategy

The research not only selects a quantitative, qualitative or mixed methods study to conduct. There is also the inquirer, who decides on a type of study within these three choices. Strategies of inquiry are types of qualitative, quantitative, and mixed methods designs or models that provide specific direction for procedures in a research design. Others have called them inquiry (Creswell, 2007) or research methodologies (Mertens, 1998). Creswell et al. (2003) distinguishes six research strategies for mixed research approach: sequential explanatory strategy; sequential exploratory strategy; sequential transformative strategy; concurrent triangulation strategy; concurrent nested strategy; and, concurrent transformative strategy.

3.3.1 Concurrent Triangulation Strategy

Within this strategy the researcher tends to collect both quantitative and qualitative data concurrently and then compares the two databases to determine if there is convergence, differences, or some combination. This model generally uses separate quantitative and qualitative methods. In this approach, the quantitative and qualitative data collected is concurrent happening in one phase of the research study. Ideally, the weight is equal between the two methods. This traditional mixed model is advantageous because it is familiar to most researchers and can result in well-validated and substantiated findings. This model also has a number of limitations. It requires great effort and expertise to adequately study a phenomenon with two separate methods. It also can be difficult to compare the results of two analyses using data of different forms. (Creswell, 2009)

Figure 23 Concurrent Triangulation Design



Source: Creswell (2009)

For my research I have decided to use Concurrent Triangulation Strategy for several reasons. First of all as mentioned above this approach minimizes the inherent weakness within one method by strengthening others. Of course this strategy has also its limitations. First of all this approach requires great effort and expertise to adequately study a phenomenon. The second, it is difficult to compare the results of two analyses using data of different forms. And finally the third, it is difficult to resolve discrepancies that arise in the results. In this study I undertook the qualitative approach prior to quantitative.

3.4 Research Design

It is usually quite difficult to design a research properly. A researcher may have an idea, choices but it is hard to design it well, it hard to make right choices at proper moment without knowing what lies ahead. A design represents a set of assumptions and considerations that leads to specific contextualized guidelines that connect theoretical notion and elements to dedicated strategy of inquiry supported by methods and techniques for collecting empirical material (Jonker and Pennink, 2010).

At the beginning of research, there is no design, since we do not have enough knowledge about the question. During the research, the researcher often discovers how the building bricks of the research design relate and connect to each other. Conducting research does not only involve searching for theory, collecting data by means of a chosen technique, such as an interview or a questionnaire. Since conducting truly useful research requires the researcher to be in continuous dialogue with himself and others. It also requires constant reasoning, which demands the temporary results of that reasoning to be explicit and well defined. Then if all this is accomplished correctly, it will mean that the research is methodologically justifiable. It is useful to keep reporting comprehensibly about the way the researcher deals with the

development of insights or testing of theory on the subject of research in relation to the utilized theory about conducting research.

3.5 Research Questions and Hypotheses

To construct performance measurement framework and model for public art museums, the following fundamental research questions have to be answered:

- **RQ1:** What is the effective performance measurement system and tools for public art museums?
- **RQ2:** How can public art museums implement the performance measurement system successfully?

To address the two fundamental questions, the following were investigated:

- **RQ3:** What are the knowledge gaps in the current literature in regard to performance measurement for public art museums?
- **RQ4:** Can management improve the museum's activities efficiency using various assessment methods?
- **RQ5:** What are the weaknesses and problems of the current management methods in museum management?
- **RQ6:** What metrics and indicators should be measured?
- **RQ7:** How can art museum managers successfully measure and manage their performance?

Hypotheses

- **H1:** Regional art museums located in the regions with the higher number of citizens are more efficient than the ones located in the regions with the lower number of citizens.
- **H2:** Regional art museums tend to be more efficient in the activities that are more visible for stakeholders.

3.6 Literature Review

To achieve the aim of developing a strategy to significantly improve the performance of museums a review of the academic literature in the areas of museum management, organisational performance measurement, marketing metrics and business planning has been undertaken.

As information is asymmetrical, practitioners in the museum sector take their decisions primarily relying on annual reports and /on administrative metrics. Often information from

these sources is not timely, offers little analytical or predictive value and is hard to aggregate or synthesise to help improve services.

3.7 Conceptual Framework Developing

For this study a conceptual framework has been developed as the research framework. This framework has been based on the review of the relevant theories of performance measurement and framework by comparing the features of current implementation of performance measurement and its requirements.

The process of developing a conceptual framework has been undertaken within two stages. Stage one focuses on studying the measurement and performance measurement frameworks that employed by museums and implementation of performance measurement in museums, through qualitative approaches. At this stage, a qualitative data collection method is used. 10 semi-structured interviews were conducted with museums, academics and practitioners. Before and after interviews, relevant performance measurement data and documents were studied. The documents include performance measurement policies, procedures, annual reports, methodologies, and studies.

At the stage two, a questionnaire-survey was conducted. A questionnaire was send to 21 regional art museums. A questionnaire was designed mainly to gain quantitative data and comprehensive information about museums. Also the second questionnaire was designed but this time for local governments and was sent to all 14 regional governments in order to obtain a comprehensive view of the relationship between a government and a museum with the strong focus on performance measurement. At the same time a quantitative data was collected through the questionnaire as well as through the study of annual reports and from NIPOS. This data was analyzed with DEA. The data collection as described above was employed.

3.8 Triangulation

This study employed methodological triangulation – concurrent triangulation strategy, which mixes both qualitative and quantitative approaches. At the same time, data-source triangulation was applied in this study. In qualitative research, the data are derived from interviews and documentary studies. In quantitative research, questionnaire surveys were employed.

3.9 Data Collection

The data collection process includes setting the boundaries for the study, collecting information through unstructured or semi-structured observations and interviews, documents, and visual material, as well as establishing the protocol for recording information (Creswell, 2013). For my research I have chosen to collect qualitative data through interview and documents. The Table 1 shows the options within the interviews and documents, also you can see the advantages of these two data collection types and their limitations. Within my research I have been aware of these specifications. I have conducted mostly face-to-face interview and also e-mail interview.

Table 9 Qualitative Data Collection Types

Data Collection Types	Options Within Types	Advantages of the Type	Limitations of the Type
Interviews	Face-to-face interview	Useful when participants cannot be directly observed	Provides indirect information filtered through the views of interviewees
	Telephone interview	Participants can provide historical information	Provides information in a designated place rather than the natural field setting
	Focus group interview	Allows researcher control over the line of questioning	Researcher's presence may bias responses
	E-mail interview		Not all people are equally articulate and perceptive
Documents	Public documents	Enables a researcher to obtain the language and words of participants	Not all people are equally articulate and perceptive
	Private documents	Can be accessed at a time convenient to researcher	May be protected information unavailable to public or private access
		Represents data which are thoughtful in that participants have given attention to compiling them	Requires the researcher to search out the information in hard-to-find places
		As written evidence, it saves a researcher the time and expense of transcribing	Requires transcribing or optically scanning for computer entry

			Materials may be incomplete
			The documents may not be authentic or accurate

Source: Creswell (2013)

3.9.1 Interviews

Most of the interviews have been conducted by face-to-face, one interview was conducted by e-mail. Interviews were semi-structured interviews with open questions in order to obtain more data, since the advantage of semi-structured interview is that it is not restricted to answer Yes or No.

Before interviews I have prepared questions. Different set of questions were prepared for practitioners, different one for academics and different one for representative of association.

In the interviews I have tried to identify the factors for the success of art museums, the current practice of performance measurement in art museums and discover experience with different tools to measure performance within museum world. Also during interviews I have observed the critical approach to performance measurement and its limitations and weakness. The interviews with practitioners were divided into three sections. The first section focused on the institution itself, about the governance and management. The second one was focused on performance measurement, critical success factor and performance measurement tools and during the third of the interviews the questions were focused on the implementation of performance measurement within museum management.

As you can see in the Table 10 I have conducted 15 interviews including: 11 interviews with museum professionals, two of them with museum professionals in France and one with museum professional in Finland (this one was conducted by e-mail), 2 interviews with the representative of museum association in the Czech Republic and two interviews with academics in France. Most of the interviews with museum professionals were conducted with directors or chief financial officers of museum. Very useful interview was the one with the Head of Socio-Economic Studies of Louvre in France. Museum professionals and academics from France were selected mainly because my research internship in Paris. The interview with the director of the Finnish Labour Museum was conducted because they have used BSC as a strategic tool.

The interviews took usually from 60 minutes to 90 minutes, most of them were recorded (with the permission of the participants) and then I did a transcript of the interviews. The interviews were conducted from November 2015 till June 2016.

Table 10 List of Interviews

Institution	Country	Interviewees	Technique
Museum A	Czech Republic	Director	Face-to-face
Museum B	Czech Republic	Chief Financial Officer	Face-to-face
Museum C	Czech Republic	Starutory of representative of the Director	Face-to-face
Museum D	Czech Republic	Chief Financial Officer	Face-to-face
Museum E	Czech Republic	Director	Face-to-face
Museum F	Czech Republic	Director	Face-to-face
Museum G	Czech Republic	Chief Financial Officer	Face-to-face
Museum H	Czech Republic	Director	Face-to-face
Museum I	France	Head of Socio-Economic Studies and Research	Face-to-face
Museum J	France	Chief Financial Officer	Face-to-face
Museum K	Finland	Director	E-mail
Museum Association A	Czech Republic	Director	Face-to-face
Museum Association B	Czech Republic	Researcher	Face-to-face
University A	France	Professor of Museology and Cultural Economics	Face-to-face
University B	France	Professor of Cultural Economics	Face-to-face

Source: Author

3.9.2 Questionnaire

I have conducted two types of questionnaires. First one was focused on regional art museum and the second one was aimed at governing bodies of these museums. Then intention of the questionnaire for art museum was to gain a quantitative data. The aim of questionnaire sent to the founders of museum was conducted in order to obtain a qualitative data. This questionnaire was sent March 17, 2016 to the Department of Culture at each regional government of the Czech Republic and contained four questions.

1. Do you have a strategy / conception / methodology for museums you run?
2. Do you monitor any performance indicators of museum you run? If so, which ones do you monitor in which way?
3. If you do not monitor any performance indicators, do you plan to do so in future?

4. Would you appreciate a new founded institution / methodological centre for museum accreditation / registration?

I have received 10 answers, 4 regions have not answered even if I asked two times.

The questionnaire for art museum was sent do 21 art museums, most of them had not replied. After one month I called them to remind the questionnaire, but even only five museums provided the information from the questionnaire.

3.10 Data Analysis

Data analysis in my research includes qualitative and quantitative data analysis. The quantitative data were analyzed using DEA.

3.10.1 Content Analysis

Content analysis represents a research technique to analyze and validate inference from texts. The central idea of content analysis is to reduce text to categories consisting of a word, set of words or phrases, on which the researcher can focus. Specific words or patterns are indicative of the researcher question and determine level of analysis and generalization. In my research, content analysis was used to answer some research questions. In order to study the performance measurement in museums published papers were reviewed and analyzed. Also, other documents from museums (annual reports, strategies, etc.) were analyzed employing content analysis.

3.10.2 Cross-case Analysis

The data from interviews was analyzed based on the conceptual framework and connected with cross-case analysis. The interview data was analyzed in order to identify the similarities and the differences at the critical success factors, performance measurement tools and application of performance measurement in management. The cross-case analysis was applied in order to look for the evidence for the framework, to generalize and analyze the approaches to performance measurement in museums, performance indicators and performance measurement tools.

As already mentioned, the interviews were divided into three groups:

- museum practitioners,
- museum association and experts,
- academics.

4. FINDINGS AND RESULTS

In the previous chapters the review of literature on performance measurement in museum theories is analyzed and after detailed description of methodology is illustrated. In this section I present the findings and results from interviews, document analysis and survey. And the proposed model is described. This chapter works with both qualitative and quantitative methodologies in order to answer the main research questions: What is the effective performance measurement system and tools for public art museums? How can public art museums implement the performance measurement system successfully? And this approach was employed to answer the questions related to the main ones:

- What are the knowledge gaps in the current literature in regard to performance measurement for public art museum?
- Can management improve the museum's activities efficiency using various assessment methods?
- What are the weaknesses and problems of the current management methods in museum management?
- What metrics and indicators should be measured?
- How can art museum managers successfully measure and manage their performance?

4.1 Analysis of Data From Interviews

The questions were investigated through interviews. The interview data was analyzed to determine similarities and differences. In this chapter the most interesting knowledge gained during the interviews are presented.

Attitude to performance measurement

Almost all executives have a negative attitude to the performance measurement in art museums, mainly because they are afraid that they would be assessed on the base of wrongly selected criterions, which would influence their funding. They all agree that performance measurement can be dangerous if it is not treated well. At the same time, museum professionals, academics and representatives of museum associations and Ministry of Culture agreed that appropriate system for performance measurement could improve their management and decision making.

Also all respondents during interviews agreed that in order to establish an appropriate agreed upon performance measurement method, the discussion between founders and museum

professionals would have to take place. Also they agreed that this method cannot be strict and has to be flexible, since each museum has several specifications.

Interviewers agreed that it is not possible to measure performance of art museums only in terms of economic indicators, but of course money is important and museums need to pay attention to the financial aspect of their work. But definitely art museums cannot be assessed based only on financial indicators.

Almost all museum executive pointed out the lack of methodology tools from the founder and wrong communication with the founder.

Important performance indicators

In the first step during the interview the museum executives, academics and representatives of museum associations were asked to say what are the most important indicators that should be monitor in museum from their perspective. Here I list these indicators. In the next step, I divided these measures into four perspectives of the BSC. The museum executives listed the following indicators:

- The partnership with other institutions
- Creation of new knowledge
- Peer reputation
- Number of catalogues published
- Number of educational programs
- Number of visitors
- Use of new technologies
- Number of artworks displayed
- Number of artworks loaned to the other institutions
- Number of artworks purchased
- Artistic impact
- Number of talks and conferences
- Number of curators with the position at the university
- Number of research grants
- Ability to attract new visitors
- Digitalization of collection
- Percentage of visitors willing to return

- Number of school visits
- Number of collaborative projects
- Self-sufficiency rate

There are plenty of aspects of museum work that are not measurable, so it is necessary to describe them verbally. In order to compare these aspects, the committee of experts is needed.

One museum professionals stayed that one of the most important challenge, nowadays in the time of crisis, is the ability to make partnerships with other museums, but also with other cultural institutions and commercial institutions. Since partnership can save costs and provide many opportunities.

Agreed upon method to measure museum performance

Important part of the interviews was to investigate whether art museums can use the agreed upon method to assess their performance.

One representative of a museum association stated that the use of one agreed upon method for individual museum can be dangerous, because it does not aim to compare a museum with its peers. This method provides information about the progress of the museum, but cannot be used for benchmarking. Therefore there is a need to establish standards in order to be able to do comparison.

Another museum professional agreed that since museums have many similarities, it is clear that there can be a common method to assess museum activities.

Benchmarking of art museums

Currently there is ongoing project Museum Benchmarking that started in 2010. Currently there are 80 museums involved, which is not a lot. That shows again the fact that museums are not interested to show their performance. In 2015 there was an idea to improve benchmarking and to cooperate with NIPOS and gain statistical data for museum that are even not involved in the project, but it did not work, because some results were nonsense. Currently the association is working on the change of indicators and they plan to start again in autumn 2016. There will be more indicators, currently there are 23 indicators. The idea is that the statistical reports that museums have to provide annually to the NIPOS will be built the way that this data can be directly used for the benchmarking. And in the future there is a plan that a museum will be able to access the website where it can compare itself with its peers. The museum association in the cooperation with NIPOS wants to build a system that has many similarities with DEA.

At the beginning the problem with the project of benchmarking was that museums refused to provide data or they provided not trustworthy data.

The system of registration of museum is definitely necessary, but it has to be done very carefully. From my point of view, the registration system should provide kind of stamp that a museum is at the certain level in terms of quality, for example like the hotels get stars. But this stamp has to be only temporary and, for example, after five years a museum has to be reviewed whether the quality is higher, lower or stable and if it still deserves to have a stamp. In order to do so, there is a need to set standards that are common for all museums and it has to be combination of qualitative and quantitative standards.

As a reaction to this, the question how to measure the quality raised. The answer was that there should be a committee of experts that would assess the quality of museums.

The current problems

One of the current problems in museum management is the lack of statistical data or the data is manipulated.

We have to push museum to fulfill statistical reports with trustworthy data.

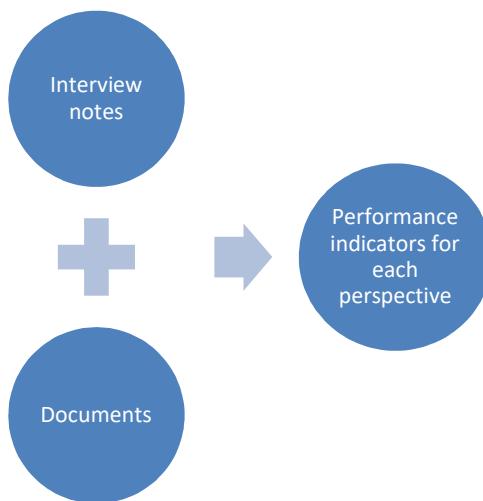
The annual reports of museums are not standardized and some of them do not provide important information. There is a need to set methodology how to build an annual reports and what kind of information it should contain.

In the last years, some studies and methodologies have been conducted and the representatives of museum association consider that they are wrong, since they have been conducted mainly by economists and do not take into account other aspects than economic point of view. These studies tend to take into account only quantitative indicators such as attendance. As a result, museums manipulate their data and tend to hunt the data that would show that a museum is efficient. Therefore museum do not pay so much attention to the care of art collection, which is one of the basic purpose of museums.

4.2 Proposed Model

One of the aims of my research has been to propose a comprehensive model to assess performance of art museums and also for benchmarking of museums. The first part of the model, assessing the performance, is based on the architecture of BSC proposed by Kaplan and Norton. The second part, benchmarking, is done with the application of DEA. This way, I propose a BSC-DEA model to assess museum performance and compare a museum with its peers. The indicators that are set in each perspective of BSC have been invented based on content analysis and cross-case analysis. The process of defining of the performance indicators for each perspective of BSC is described in the simple Figure 24.

Figure 24 Process of Defining Performance Indicators



Source: Author

I propose a general model and each art museum should adapt it to its specifics and unique strategic requirements.

As mentioned previously, an effective BSC begins with a clear mission of a museum. So this is the first step that I would recommend to museums before applying BSC in the management. The mission should be clear and written document and should reflect the organization's unique value and vision.

Defining the model I have been aware of the following requirements:

- The model cannot be too difficult. It has to be understandable for museum managers, but also for funders and it has to be easily interpretable for all stakeholders.
- The model has to include all critical aspects of museum activities.
- The model has to be applicable in practice.

- The model has to be flexible. Since each museum is specific institution, the model has to provide the opportunity for a museum to adopt the model to its management and choose indicators that are crucial for the museum.

My model is proposed for regional art museums which are middle size organizations. The model can be used also for smaller or bigger organizations but would have to be transformed. For example within the bigger institution there it is recommended to have BSC for each department and one BSC for the organization as a whole.

The Table 11 shows the basic proposed model of BSC for art museums. This basic model could be used as managerial tool, but also as a communication tool that a museum could add to its annual report and publish on its website. It would increase transparency and accountability.

Museum could determine goals within each perspective, but it has to also set indicators to measure whether the museum is achieving its desired goals or not. My recommendation is to produce a new BSC annually. The museum has to be aware that goals should arrive from a mission and strategy of the museum.

The idea of the model is that each museum would build its own BSC and the analysis with DEA approach would be conducted by the Ministry of Culture of the Czech Republic.

Table 11 BSC for Art Museums

Perspective	Goals	Indicators to Measure Progress
Public Perspective		
Financial and Governance Perspective		
Learning and Growth		
Internal Perspective		

4.2.1 Public Perspective

Public perspective aims at assessing the museum's relationship with its communities and also the communities' perception and experience of the museum's programming and its visitor services.

The goals within public perspective involve, for example, the effort to increase public engagement and knowledge diffusion. The museum should try to enlarge its audiences, extend engagement of the museum with the public and also improve the visitor's physical comfort. The question is how to measure this goal? The important indicator how to measure the progress of this goal is the number of visitors who might not otherwise visit the museum. These visitors might be attracted by wide range of events such as concerts, films, and lectures. Also another indicator is the range and variety of programs that the museum offers. Other could be percentage of visitors willing to return, number of schoolchildren visiting the museum, number of attendees at lectures and discussions, percentage of artworks in the collection exhibited, the number of artworks on the museum's website, percentage of visitors satisfied with program (exhibition, program, guided tour, lectures, discussion, educational programs) and services (café, restaurant, museum shop, etc).

Table 12 shows all proposed indicators in this model in the Public Perspective.

Table 12 List of Indicators for Public Perspective

Public Perspective		
Number	Indicators	Type of indicator
1.	Number of visitors	number
2.	Number of exhibitions	number
3.	Number of accompanying programs	number
4.	Number of educational programs	number
5.	Number of tourists	number
6.	Number of school visits	number
7.	Number of website visitors	number
8.	Number of members	number
9.	Number of volunteers	number
10.	Number of visiting researchers	number
11.	Number of consultations	number
12.	Number of request from scholars for access to the collections	number
13.	Number of items borrowed and photocopied	number

14.	Number of study courses based on the collection	number
15.	Number of publications presenting the collection	number
16.	Number of lectures presenting the collection	number
17.	Use of tutorial room	number
18.	Production of education materials	description
19.	Percentage of leaflets produced	percentage
20.	Visitor satisfaction	description
21.	Average number of hours open per week	number
22.	Low income accessibility: hours per week available for free	number
23.	Minority attendance	annual minority attendance/total annual attendance
24.	Capacity utilizations	total annual attendance/square feet accessible to the public

Source: Author

4.2.2 Financial and Government Perspective

It is clear that financial perspective is not the most important aspect. But without finance the museum would not be able to provide activities that are represented in other perspectives of BSC. Also museum needs to be accountable for the economic use of resources.

One of the main goals in the perspective is to increase financial support. As already mentioned previously, there has been a strong pressure on museums to increase their financial independence. It is important for museum to diversify its sources and strengthen its fundraising capability. Indicators in this dimension are ability to meet fundraising targets, fundraising efficiency, percentage of the diversity of sources, sponsorship, earned revenue (from tickets sales, shops, restaurants, ...).

In this perspective another goal could be to advance museum governance and accountability. As Zorloni (2012) points out good governance supports effectiveness.

Table 13 presents all indicators in Financial and Government Perspective.

Table 13 List of Indicators for Financial and Government Perspective

Financial and Government Perspective		
Number	Indicators	Type of indicator
1.	Fundraising efficiency	fundraising cost / fundraising income
2.	The diversification of resources	number
3.	Fundraising for operations	gifts restricted to operations
4.	Net revenue variance	number

5.	Attracting new supporters / sponsors	number
6.	Increase in self-generated income by type	percentage + description
7.	Diversification of resources	percentage + description
8.	Fulfilment of cost budget items	percentage + description
9.	The amount of money gained endowment	total income / endowment income

Source: Author

4.2.3 Learning and Growth Perspective

This perspective is linked with organizational culture and emphasizes organizational learning. One of the goals in this perspective is developing staff capacity. Satisfaction of employees of the museum strongly influences the performance of the museum. Employees are key stakeholders of the museum and they play a crucial role in creating and developing artistic content of the museum. Therefore it is important to focus also on the employee of the museum.

The performance in this area could include metrics such as number of full-time curators, number of fulltime curators with PhD, percentage of the budget dedicated to training and professional development, use of 360 degree feedback, percentage of employees who are satisfied with working in the museum.

Another goal in this perspective could be improve the internal communication. Metrics in this area could be percentage of goals met from the recent strategic plan, percentage of employees who are satisfied with the quality of internal communication.

Table 14 shows all proposed indicators for the Learning and Growth Perspective.

Table 14 List of Indicators in Learning and Growth Perspective

Learning and Growth Perspective		
Number	Indicators	Type of indicator
1.	Number of curators	number
2.	Number of training courses	number
3.	Budget dedicated to training	training budget / total budget
4.	Number and type of benefits for employees (tickets for culture event,	number + description

	tickets to sport centres, etc.)	
5.	Satisfaction of employees (number of employees satisfied with the job, 360 degree feedback)	number + description
6.	Rate of employees with professional certification / qualified /PhDs	number of employees with profossalional certification ... / total number of employees
7.	Percentage of employees aware of the museum's vison and goals	percentage of employees aware of the museum's vision and goals / total number of employees
8.	Turnover of staff	number
9.	Volunteer contribution	volunteer FTE / staf FTE
10.	New innovation	description
11.	Facilities for disabled	description
12.	Environment sustainability	description

Source: Author

4.2.4 Internal Perspective

Internal perspective includes stewardship of collections that is one of the main purposes of museums and also dimension of scholarship and the development of new knowledge.

Building and preserving the museum art collection is crucial for museum. Stewardship of collection is defined as the careful, sound and responsible management of objects hat have an intrinsic value to art, history or culture and are held in trust by a museum on behalf of the public (Fox, 2006). Important performance indicators are receive donations from private collectors, expand public access to collections through digital technologies, percentage of works displayed, the number of artworks loaned to other museums, the number of purchased artworks, the number of artworks that have been catalogued, the number of artworks that have been restored.

The second goal could be strengthen research and create new knowledge. The creation of new knowledge comes from the research activities undertaken in an art museum. The new knowledge are created around exhibitions organized by the museum, publishing catalogues and articles, etc. Measures within this dimension could be the number of requests from other institutions, museum's reputation within the field, which is hard to measure, but could be indicated by number of grants awarded, number of employees working also as teachers or researchers at universities or research laboratories.

Some museum professionals indicated as a important measure the number of positive reviews in media. Others indicators are: the number of articles in peer-review journals written by museum staff, the number of published catalogues, the number of curators / other museum staff participating at conferences, the number of scholarly seminars organized by the museum.

Another very important goal especially nowadays is the ability to forge new partnership and strengthen relationship with other institutions. This goal relates to the museum 's willingness to look for partnership with other institutions, both at national and international level. It does not mean that the museum should focus on partnership only with other art museums. The museum could find a way of partnership and collaboration with other cultural institutions. The indicators within this dimension could include the number of international curators involved in designing artistic content, the number of exhibition created by the museum that have traveled to other institution internationally in the next three years, the number of the exhibition created in the collaboration with other institutions, the number of other collaborative projects with other cultural organizations.

Table 15 shows all proposed indicators in the Internal Perspective.

Table 15 List of Indicators in Internal Perspective

Internal Perspective		
Number	Indicators	Type of indicator
1.	Numer of new acquisitions	number
2.	Number of items repaired in the preservation laboratory	number
3.	Number of archived and preserved items	number
4.	Conservation and restauration costs	number
5.	Cost for new acquisition	number
6.	Loss of collections	number
7.	Number of loans	number
8.	Security efficiency	security cost / (total square feet/attendance)
9.	Commitment to maintenance	building maintenance expenses / total square feet
10.	Energy efficiency	energy costs / total squire feet

11.	Operating cost per visitor	total operating expanses / total attendance
12.	Exhibition maintenance capability	exhibition maintenance staff FTE / exhibit square feet
13.	Cost of collecting (staff, transport, etc.)	number
14.	Number of articles in media	number
15.	Media reaction	number + description
16.	Number of new partnerships	number + description

Source: Author

4.2.5 Implementation of the BSC

The implementation of the proposed model is quite easy and inexpensive. Almost any museum is able to start to monitor and improve its performance, choose the indicators that are best suited to its strategy and its budget.

At the beginning, before developing and implementing the BSC, it is necessary to organize several meeting with all museum staff and probably with the founder to make them familiar with the BSC and also the group should determine together the performance indicators.

Then when the museum has a set of indicators for each strategic objective we select the most important ones.

After the museum has designed its scorecard, in case of bigger museums, it could do the same for each department.

Then my recommendation is that the museum should present its BSC as a part of the annual report or as a dashboards.

4.2.6 BSC - Tool for Internal Benchmarking

As mentioned previously, from my point of view, the BSC is not efficient tool for comparison with the museum's peers. Yet, it is useful for internal benchmarking that represents systematic and continuous process of measuring and comparing a museum's performance towards performance improvement. Benchmarking focuses on identifying a desired level of result for a particular element (Fox, 2006). Chong (2002) points out that the best comparisons are with the institution's past performance and targets established for planning purposes. Generally speaking, during internal benchmarking, we ask the question what have our results been in the

past and what do we want them to be in the future? The internal benchmarking is extremely useful for understanding the past and for decision making for future goals.

It is also useful to add comments to the BSC, since the change of indicators can be caused by other circumstances.

4.2.7 Combination BSC with DEA

One of the aims of this study is to examine a joint model combining DEA approach and the BSC tool. To fulfill this aim I propose a two stage BSC-DEA model. In the first step DEA methodology is used to analyze the efficiency of each museum in each perspective of the BSC. The second step contains of measuring the overall relative efficiency of the art museums. I do so by using relative efficiencies from each perspective as outputs of each museum and operational budget as input. These are analyzed again with DEA methodology.

In order to collect the quantitative data I have send a questionnaire by email to 21 art museums, but received answer only from five art museums. Therefore, for the DEA analysis, I had to use the data that I was able to collect from the annual reports and from the publications of NIPOS. In the Czech Republic, there are 52 art museums, as shown in Table 3, which is 10.8% of all museums in the Czech Republic. Four art museum are run by the Ministry of Culture, 21 art museums are run by the regional governments and 27 are run by the municipalities. To gain the data from municipal art museums would be even more difficult than the data from regional museums. Art museums founded by the Ministry of Culture provide quite comprehensive data, but only four museums would not be a sufficient sample. That way, I decided to work with the sample of the regional art museums.

4.2.8 First Step of the BSC-DEA Model

In the first step, indicators from each perspective were selected for the analysis by using DEA approach. I have used software Frontier Analyst, version 4 by Banxia Software Ltd.

The selection was based on the interviews mostly with museum professionals, but also I was limited by the data that I was able to gain. The data was gained from the NIPOS, and annual reports of the museums. The data is from the year 2015.

Table 16 First Step of the BSC-DEA Model

Perspective	Variables
Public Perspective	Input: Operational budget Number of visitors of all exhibitions in the region Outputs: Number of visitors, Number of exhibitions

Internal Perspective	Input: Operational budget Outputs: Number of purchased artworks, Number of loans
Learning and Growth Perspective	Input: Operational budget, Number of employees (FTE) Outputs: Personal training Membership in experts organizations, Number of curators with PhD
Financial Perspective	Input: Operational budget Outputs: Admission income, The amount of money gained from endowments

Source: Author

Table 16 shows the first step of the BSC-DEA model and lists the variables in each perspective.

Since I selected the homogenous group of museums, my selection for analysis contains only 19 museums. This small number of DMUs is also the reason why the number of variables is low, because it is known that the number of DMUs limits the number of variables. To analyze the relative efficiency of the art museums I used model focused on maximization of outputs and BCC model with variable returns to scale was employed. In the case of art museums, outputs do not directly reflect input levels. With this model outputs fall off as input levels rise. Using the variable returns to scale option allows more room in order to find optimal solutions. With this approach, no unit will receive a lower efficiency score using variable return to scale, than it had with constant returns to scale model. The result of this is that the total number of 100% efficient art museums will be probably higher.

In the Public perspective I used operational budget as the one of inputs. In this perspective, my goal was to take into account the size of the region that is why I decided to use the number of visitors of all exhibitions in the region as input. Number of visitors and number of exhibitions are used as outputs. Table 17 shows the data that have been used for analysis of the public perspective by using DEA approach.

Table 17 Public Perspective – BSC-DEA Model

Public Perspective				
Museum	Input		Output	
	Operation budget	Number of visitors of all exhibitions in the region	Number of visitors	Number of exhibitions
M1	25 237 000	505 891	50 819	17
M2	117 751 000	4 495 024	255 050	27
M3	17 881 000	424 166	20 684	23
M4	12 869 000	453 590	10 778	9

M5	6 934 000	409 062	16 322	13
M6	43 849 000	1 113 407	20 717	31
M7	16 125 000	281 444	22 518	27
M8	5 602 000	311 280	19 781	15
M9	6 891 000	902 360	4 658	15
M10	9 852 000	281 444	9 905	24
M11	4 594 000	453 590	5 079	14
M12	23 928 000	704 995	97 346	33
M13	7 565 000	792 535	28 551	22
M14	24 759 000	251 026	41 900	25
M15	6 580 000	311 280	14 712	20
M16	5 356 000	409 062	9 856	20
M17	13 171 000	409 062	15 797	12
M18	7 938 000	372 986	21 580	19
M19	21 830 000	424 166	28 873	18

Source: NIPOS (2015)

The second analyzed perspective is Internal Perspective. Within this perspective I used operational budget as the input and two outputs: number of purchased artworks and number of loans. We have to be aware of the fact that we cannot overemphasized these indicators and it requires deeper investigation, since a museum can buy 200 artworks per year and it does not mean that these artworks make a art collection of this museum better than the art collection of a museum which purchased 5 artworks. We can apply this approach also to the number of loans.

Table 18 Internal Perspective – BSC-DEA model

Museum	Internal Perspective		
	Input	Output	
		Number of purchased artworks	Number of loans
M1	25 237 000	45	140
M2	117 751 000	138	234
M3	17 881 000	216	22
M4	12 869 000	47	136
M5	6 934 000	7	82
M6	43 849 000	38	35
M7	16 125 000	8	89
M8	560 2000	117	106
M9	6 891 000	25	72
M10	9 852 000	8	24
M11	4 594 000	11	89
M12	23 928 000	1	306
M13	7 565 000	1	27

M14	24 759 000	1	162
M15	6 580 000	3	100
M16	5 356 000	2	45
M17	13 171 000	99	40
M18	7 938 000	20	123
M19	21 830 000	8	63

Source: NIPOS (2015)

Table 19 represents the Learning and Growth Perspective where the operational budget and number of employees (full time equivalent) were used as inputs and number of training for employees and number of memberships of employees in expert organizations were used as outputs. It would be probably more appropriate to use budget dedicated to education for employees as one of the inputs, and as one of the outputs could be used indicators connected with innovation and environmental sustainability. But unfortunately, I have not succeeded to gain this data.

Table 19 Learning and Growth Perspective – BSC-DEA model

Learning and Growth Perspective				
Museum	Input		Output	
	Operational Budget	Number of employees (FTE)	Number of training	Membership in expert organizations
M1	25 237 000	16	8	3
M2	117 751 000	73	18	10
M3	17 881 000	18	16	7
M4	12 869 000	10,6	4	2
M5	6 934 000	10,75	2	1
M6	43 849 000	26	5	5
M7	16 125 000	22,2	9	4
M8	5602000	8,5	3	2
M9	6 891 000	7,2	1	2
M10	9 852 000	10	4	3
M11	4 594 000	9	6	3
M12	23 928 000	28	17	12
M13	7 565 000	21,55	14	14
M14	24 759 000	18,3	3	5
M15	6 580 000	13	12	2
M16	5 356 000	17	9	5
M17	13 171 000	23,32	12	6
M18	7 938 000	15	8	6
M19	21 830 000	30,89	19	9

Source: NIPOS (2015)

The last but not least perspective is the Financial Perspective. Again, the operational budget was used as the input and admission income and the amount of money gained from

endowments were used as the outputs within the financial perspective. The data from 19 regional art museums are shown in the Table 20.

Table 20 Financial Perspective – BSC-DEA model

Museum	Financial Perspective		
	Input	Output	
	Operation budget	Admission income	The amount of money gained from endowments
M1	25 237 000	1 067 000	420 135
M2	117 751 000	8 860 000	2 532 000
M3	17 881 000	788 000	320 000
M4	802 000	178 500	158 000
M5	6 934 000	146 000	735 000
M6	43 849 000	1 921 000	1 235 000
M7	16 169 000	613 526	290 975
M8	5169000	315 000	93 200
M9	6 891 000	40 000	39 000
M10	9 322 000	171 663	805 000
M11	4 594 000	95 000	546 818
M12	23 928 000	121 000	616 000
M13	11 798 000	331 263	826 000
M14	22 998 000	709 000	665 000
M15	7 791 000	174 000	121 500
M16	10 358 000	61 000	372 000
M17	12 978 000	100 000	233 000
M18	8 378 000	374 000	396 000
M19	27 954 000	833 012	1 253 824

Source: NIPOS (2015)

The last part of the first step of the analysis of the relative efficiency of set of the art museums by the joint BSC-DEA model is to analyze use DEA approach for each perspective. The Table 21 shows the results obtained by applying BSC-DEA model. It shows the score of relative efficiency and the ranking in each perspective. The most efficient art museums within the group is given the efficiency score 100% and the efficiency of the others is based on the efficiency of the most efficient art museum. The ranking is logically based on the efficiency scores. Due to the use of DEA methodology in each perspective of the BSC tool, we can analyze in which part of museum activity is an art museum strong and in which area is strong and can be inspiration for the other.

Regarding the public perspective, ten art museums (M2, M7, M10, M11, M12, M13, M14, M15 and M16) are relatively efficient ($E=1$). The situation is different in the Internal perspective, where are only five art museums (M2, M3, M8, M11 and M12) fully efficient.

Given this results we can assume that most of the regional art museums are more effective in Public Perspective, it means with the activities that are offered to the public. However, they are less efficient in the Internal Perspective, we can therefore presume that regional art museums focus more on activities that are more visible to the public than on the activities than are less visible for the public. The similar situations are in the Learning and Growth Perspective and in the Financial Perspective. In the Learning and Growth Perspective, there are eight art museums (M3, M9, M11, M12, M13, M15, M16 and M17) fully efficient and in the Financial Perspective, there are only six art museums (M2, M4, M5, M10, M11 and M19) that have efficient score 100%.

Table 21 Relative Efficiencies Score and Ranking in Each Perspective

Museum	Public Perspective		Internal Perspective		Learning and Growth Perspective		Financial Perspective	
	Score	Ranking	Score	Ranking	Score	Ranking	Score	Ranking
M1	69.6%	8	64.1%	6	56.3%	7	56.3%	8
M2	100%	1	100%	1	98.7%	2	100%	1
M3	80.4%	4	100%	1	100%	1	56.9%	7
M4	34.8%	11	73.4%	4	52.3%	9	100%	1
M5	71.5%	6	68.0%	5	25.6%	12	100%	1
M6	93.9%	2	25.5%	12	35.7%	11	83.8%	3
M7	100%	1	40.3%	11	55.5%	8	50.8%	10
M8	100%	1	100%	1	71.8%	6	62.7%	6
M9	70.1%	7	60.0%	7	100%	1	8.8%	14
M10	100%	1	15.7%	15	73.9%	5	100%	1
M11	100%	1	100%	1	100%	1	100%	1
M12	100%	1	100%	1	100%	1	53.2%	9
M13	100%	1	21.2%	14	100%	1	97.2%	2
M14	100%	1	53.0%	9	44.3%	10	63.3%	5
M15	100%	1	85.7%	3	100%	1	29.9%	12
M16	100%	1	44.2%	10	100%	1	44.8%	11
M17	46.3 %	10	59.2%	8	76.6%	4	26.5%	13
M18	93.0 %	3	93.5%	2	77.2%	3	74.4%	4
M19	62.0 %	9	24.2%	13	100%	1	100%	1

Source: Author

Using BSC-DEA model offers even more advantages. We can see the peer group for each perspective. Therefore we can see the best practice set of museums which is a benchmarking for a given museum. Table 22 shows the results. For example, art museum M1 could improve its performance by imitating the behavior of museums M12 and M14 in the Public perspective, M12, M2 and M3 in the Internal perspective, art museums M11, M15 and M3 in the Learning and Growth Perspective and art museums M2, M4 and M5 in the Financial

Perspective. Art museum M2 constitutes its benchmark in the Public Perspective, Internal Perspective and Financial Perspective. But it can draw inspiration in the Learning and Growth Perspective from the art museums M12 and M19. I could continue with the same logic and do the long list of all art museums from the set.

Table 22 Peer Groups Associated to Each Museum

Museum	Public Perspective	Internal Perspective	Learning and Growth Perspective	Financial Perspective
M1	M12, M14	M12, M2, M3	M11, M15, M3	M2, M4, M5
M2	M2	M2	M12, M19	M2
M3	M10, M12, M7	M3	M3	M2, M4, M5
M4	M10, M12, M13	M12, M8	M11, M13, M3	M4
M5	M12, M13, M15, M8	M12, M8	M11, M13, M3	M5
M6	M12	M12, M2, M3	M13	M10, M19, M2
M7	M7	M12, M8	M13, M19, M3	M2, M4, M5
M8	M8	M8	M11, M13, M9	M2, M4
M9	M13, M16	M12, M8	M9	M2, M4, M5
M10	M10	M12, M8	M11, M13, M9	M10
M11	M11	M11	M11	M11
M12	M12	M12	M12	M10, M19
M13	M13	M12, M8	M13	M10, M19, M2
M14	M14	M12, M2	M13	M10, M19, M2
M15	M15	M12, M8	M15	M2, M4, M5
M16	M16	M11, M8	M16	M10, M19
M17	M10, M12, M15, M16	M12, M3, M8	M13, M19, M3	M10, M19, M2
M18	M12, M13, M15, M8	M12, M8	M11, M13, M3	M2, M4, M5
M19	M12, M7	M12, M3, M8	M19	M19

Source: Author

DEA approach provides also information about the potential improvement. We can obtain the data how each art museum could improve its performance. These results are displayed in Table 23. The table shows how the given output would have to increase in percentage in order to transform an inefficient art museum into efficient one. For example, art museums M1 would need to increase the number of visitors by 43.70% and by 73.50% the number of exhibitions in order to be efficient. We can see, that art museum M2 has “no room for improvement” in this perspective. To be exact there is no room for improvement within the set of these art museums, since we measure the relative efficiency.

Table 23 Output Improvement in the Public Perspective

Public Perspective		
Museum	Number of visitors	Number of exhibitions
M1	43.70%	73.50%
M2	0%	0%
M3	122.30%	24.40%
M4	187.70%	187.70%
M5	40.70%	40.70%
M6	369.90%	6.50%
M7	0%	0%
M8	0%	0%
M9	390.50%	42.60%
M10	0%	0%
M11	0%	0%
M12	0%	0%
M13	0%	0%
M14	0%	0%
M15	0%	0%
M16	0%	0%
M17	116%	116%
M18	7.60%	7.60%
M19	65.30%	61.20%

Source: Author

The same principle works for the other perspectives. Table 24 shows the way how the art museums could improve their performance in the Internal Perspective. We can see, for example, that the art museums M13 should improve its purchase more artworks by 10357.50%, since as shown in Table 18, the art museum bought only 1 artwork in 2015. Again, I want to stress that it is necessary to conduct deeper investigation, since it could be very expensive and highly quality art work. It is not possible to say that an art museum should purchase certain number of art works per year in order to be efficient. In this case we need to take into account the art museum collection, the quality and type of artworks purchased, and consider the whole context of the art museum. To sum it up, to assess these indicators, it is not possible to have a narrow minded vision of these aspects and museums cannot be assessed without the knowledge of museum activities. Therefore, it is dangerous to measure performance of cultural institution without considering other aspects that are very often qualitative nature.

Table 24 Output Improvement in the Internal Perspective

Internal Perspective		
Museum	Number of purchased artworks	Number of loans
M1	55.90%	55.90%
M2	0%	0%
M3	0%	0%
M4	51.10%	36.30%
M5	1451%	47%
M6	292.30%	292.30%
M7	529.,90%	148.10%
M8	0%	0%
M9	335.40%	66.80%
M10	1026.20%	534.90%
M11	0%	0%
M12	0%	0%
M13	10357.50%	371.90%
M14	88.60%	88.60%
M15	3593.60%	16.70%
M16	4456.50%	126.30%
M17	68.90%	68.90%
M18	411.10%	6.90%
M19	312.70%	312.70%

Source: Author

Table 25 represents the potential output improvement in the Learning and Growth Perspective. Except art museums M5 and M14, there are no extremes. For example, the art museum M1 could improve its performance by increasing both, the number of training for its employees and the number of membership of its employees in expert organizations by 77.70%. The art museums M3, M9, M11, M12, M13, M14, M15 and M19 are fully efficient within the Learning and Growth Perspective and therefore the percentage of potential improvement of their outputs is zero.

Table 25 Output Improvement in the Learning and Growth Perspective

Learning and Growth Perspective		
Museums	Number of trainings	Number of membership in expert organizations
M1	77.70%	77.70%
M2	1.40%	1.40%
M3	0%	0%
M4	91.30%	91.30%
M5	290.30%	290,30%
M6	180%	180%
M7	80.30%	134.30%

M8	39.30%	39.30%
M9	0%	0%
M10	35.30%	35.30%
M11	0%	0%
M12	0%	0%
M13	0%	0%
M14	268.50%	125.60%
M15	0%	0%
M16	0%	0%
M17	30.60%	90.20%
M18	29.50%	29.50%
M19	0%	0%

Source: Author

The interesting and useful analysis provides DEA approach in the Financial Perspective. Due to the output improvement, we are able to say what amount of money an art museum should gain from endowments in order to be fully efficient. For example, the art museum M1 should increase its amount of money gained from endowment from actual amount of 42.0135 CZK to 745.632,2 CZK, so increase the actual amount by 77.50% to reach the efficiency.

Table 26 Output Improvement in the Financial Perspective

Financial Perspective			
Museum	Actual amount of money gained from endowments	Target amount of money gained from endowments	Improvement of the amount of money gained from endowments
M1	420135	745632,2	77.50%
M2	2532000	2532000	0%
M3	320000	562181,9	75.70%
M4	158000	158000	0%
M5	735000	735000	0%
M6	1235000	1473193,69	19.30%
M7	290975	572997,48	96.90%
M8	93200	246647,68	164.60%
M9	39000	444048,4	1038.60%
M10	805000	805000	0%
M11	546818	546818	0%
M12	616000	1156842,17	87.80%
M13	826000	849786,77	2.90%
M14	665000	1049910,49	57.90%
M15	121500	406600,63	234.70%
M16	372000	829956,08	123.10%
M17	233000	879190,3	277.30%
M18	396000	532552,94	34.50%
M19	1253824	1253824	0%

Source: Author

4.2.9 Second Step of the BSC-DEA Model

The second step of the BSC-DEA model is focused on obtaining the overall relative efficiency of the set of art museums. I do so by using operational budget as input and efficiency scores from each perspective as outputs. Table 27 summarizes the results of the previous step of the BSC-DEA model and shows the input and output variables for the DEA analysis of the overall efficiency.

Table 27 Second Step of the BSC-DEA Model

Museum	Input	Output			
	Operational budget	Public Perspective	Internal Perspective	Learning and Growth Perspective	Financial Perspective
M1	25 237 000	69.6%	64.1%	56.3%	56.3%
M2	117 751 000	100%	100%	98.7%	100%
M3	17 881 000	80.4%	100%	100%	56.9%
M4	802 000	34.8%	73.4%	52.3%	100%
M5	6 934 000	71.5%	68.0%	25.6%	100%
M6	43 849 000	93.9%	25.5%	35.7%	83.8%
M7	16 169 000	100%	40.3%	55.5%	50.8%
M8	5169000	100%	100%	71.8%	62.7%
M9	6 891 000	70.1%	60.0%	100%	8.8%
M10	9 322 000	100%	15.7%	73.9%	100%
M11	4 594 000	100%	100%	100%	100%
M12	23 928 000	100%	100%	100%	53.2%
M13	11 798 000	100%	21.2%	100%	97.2%
M14	22 998 000	100%	53.0%	44.3%	63.3%
M15	7 791 000	100%	85.7%	100%	29.9%
M16	10 358 000	100%	44.2%	100%	44.8%
M17	12 978 000	46.3 %	59.2%	76.6%	26.5%
M18	8 378 000	93.0 %	93.5%	77.2%	74.4%
M19	27954000	62.0 %	24.2%	100%	100%

Source: Author

Table 28 shows the final results of the second step of the BSC-DEA model. The score in Table 28 represent the comprehensive indicator of the overall efficiency. We can note in Table 27 that only two art museums (M2, M12) that are efficient in the three perspective of the BSC and only one art museum (M11) is efficient with respect to the four perspectives of the BSC. Of course these are also efficient in the second step. Though, other art museums that are efficient only in some perspectives have been able to reach the maximum value, full efficiency of the final overall efficiency. Only four art museums (M1, M6, M17 and M18) are inefficient related to the final overall efficiency, these are museums did not reach efficiency score 100% in any of the four perspectives.

Table 28 Overall Efficiency

Museum	Score	Ranking
M1	69.6%	5
M2	100%	1
M3	100%	1
M4	100%	1
M5	100%	1
M6	93.9%	2
M7	100%	1
M8	100%	1
M9	100%	1
M10	100%	1
M11	100%	1
M12	100%	1
M13	100%	1
M14	100%	1
M15	100%	1
M16	100%	1
M17	76.6%	4
M18	93.5%	3
M19	100%	1

Source: Author

4.3 Questionnaire for Governing Bodies

As mentioned above, I have conducted a questionnaire among all founders of regional museums. I contacted departments of culture of the 14 regional governments with four questions and 10 of them replied. The questionnaire contained the following questions:

1. Do you have a strategy / conception for museums you run?
2. Do you monitor any performance indicators of museum you run? If so, which ones do you monitor and in which way?
3. If you do not monitor any performance indicators, do you plan to do so in future?
4. Would you appreciate a new founded institution / methodological centre for museum accreditation / registration?

The purpose of this questionnaire was to gain a comprehensive overview of the topic of performance measurement of regional museums. The regional governments, founders of regional museums, are important players and have huge influence on museum performance. This questionnaire is also important for discovering the current situation and relationship between the regional art museums and their founders and attitude of the regional government to performance measurement.

4.3.1 Analysis of the First Question

Do you have a strategy / conception for museums you run?

Region 1 Yes

Region 2 Yes

Region 3 Yes, but it is part of the strategy for all organizations run by the region.

Region 4 Yes

Region 5 Yes

Region 6 Yes, but it is part of the strategy for all organizations run by the region.

Region 7 Yes

Region 8 No

Region 9 Yes, but it is part of the strategy for all organizations run by the region

Region 10 No

As you can see, 8 from 10 regions claim that they have a conception document for museum, 3 of them are part of a bigger document for the whole field of culture in the region. Only two regions do not have a conception for museums. Most of the interviewed museum professionals stated that there is a lack of strategy and methodology from the founders of the museum. On the other hand, most of the regional governments say that they have strategy for their museums. This shows the lack of communication and cooperation between regional museums and their founders.

4.3.2 Analysis of the Second Question

Do you monitor any performance indicators of museum you run? If so, which ones do you monitor in which way?

Region 1 We set a performance indicator when we create a budget. For example for 2016, we set a % for presentation of items from the museum collection on the museum's website.

Region 2 Yes. We monitor the annual attendance, the number of purchased items, the budget.

Region 3 We monitor the tasks that are set by the law. But all museums are too different to measure their performance.

Region 4 The regional government every year approved the annual reports of all museums. Museums have to also submit information about the number of events, annual attendance, the membership of directors in the associations and

professional organizations, the number of publications and articles, the external sources of funding, the budget and headcount.

Region 5 Yes, most of the indicators are set out in the report on the activities of the organizations for the past year, which is discussed and approved by the founder.

We monitor following indicators: number of visitors, number of exhibitions, number of guided tours, number of educational programs, number of events for schools, number of other accompanying programs, number of new acquisitions, number of loans, conservation, presentation of an organization, publication and research activities, gained revenue (admission, grants, donations, etc.), budgets.

Region 6 We have set of indicators which help us to monitor performance of museums. We publish these indicators on our website. We monitor these indicators: basic economic indicators, the number of pursued artworks, number of loans, number of research projects, number of grants, number of presentation at conferences, number of research events organized by museum, number of publications, number of temporary exhibitions, number of permanent exhibitions, number of touring exhibitions, number of lectures, number of visitors, visitors of researchers, number of different types of attendees.

Region 7 Number of exhibition, number of other events, number of attendees, revenue, average admission fee.

Region 8 Number of visitors, revenue, number of exhibitions.

Region 9 We monitor traditional indicators such as number of visitors and number of events. Since 2015 it has been mandatory for all cultural organizations to publish annual report. Also last year we started to monitor number of new artworks pursued to the art collection.

Region 10 Currently we monitor indicators about attendance, building art collections, exhibition activities, revenue. Museums have to provide a report with all this information every year.

As we can see, almost all regions impose their museums to collect data. Surprisingly, it seems that regions are more active in performance measurement of their museums than museums themselves. Some regions even publish many performance indicators on their websites and the museums do not do so. For example the region 6 publishes on its website many performance indicators of the institutions their run, but the art museums in this region do not

publish these indicators nor on their website either as a part of their annual reports. The results of the answers to this question say that almost all regional government require from their museums information such as number of visitors, number of exhibitions, number of purchased artworks, number of education program, number of purchased artworks and number of loans. Some regions force museums to collect even more data related to number of grants, number of presentation at conferences, number of research visits, etc. It seems that museums annually provide to their founders quite comprehensive data about the performance of museums, but at the same time, they tend to hide this information. It raises the question whether this data are trustworthy, or if museums just provide data that are manipulated.

4.3.3 Analysis of the Third Question

If you do not monitor any performance indicators, do you plan to do so in future? Usually regions that claimed that they monitor performance indicators did not reply to this questions.

- Region 1** From my experience I think that set of indicators for museums on national level would not be efficient, since each museum has different conditions and specifications.
- Region 2** x
- Region 3** It depends on many factors, for example, the result of elections.
- Region 4** x
- Region 5** x
- Region 6** Even if we already monitor some indicators, we are working on improving monitoring system. Now we are testing the new system. The main purpose of this system is to improve management of our funded organizations.
- Region 7** x
- Region 8** x
- Region 9** No, we do not plan any systematic monitoring.
- Region 10** In the future we want to focus more on the education activities of museums (offer of education activities pro primary and high schools, for families, seniors and disabled people) and research activities (number of research publications, articles in peer-review journals, presentation at conferences, involvement in research projects).

Most of the regions are satisfied with the current situation and do not plan to collect more data. However, two regions plan to improve their monitoring system of performance of their

institutions. Even if 2 regions is not a lot, there is a tendency to improve the management of their organizations and hopefully this tendency will be followed by other regions. The region 10 plans to collect data related to education and research activities and obtain indicators related to these disciplines.

4.3.4 Analysis of the Fourth Question

Would you appreciate a new founded institution / methodological centre for museum accreditation / registration?

- Region 1** No, it would be another pointless administrative burden.
- Region 2** We would appreciate if Ministry of Culture did more effort in the field of collection policy. Ministry could organize more seminars and education events related to the collection policy. New institution would be useless and it would be expensive.
- Region 3** There are already enough pointless state institution, there is no need to found a new one.
- Region 4** Currently, there is no reason for such an institution.
- Region 5** I have no opinion.
- Region 6** Yes! Because it would be useful to finally officially distinguish between the institutions listed in CES or institutions that meet the standards and the institutions that use the term museum, but in fact are not a museum.
- Region 7** No. The las 122/2000 Sb. is enough.
- Region 8** No.
- Region 9** No, it is just another step to categorize museums.
- Region 10** The system of methodical centers has proved to be a useful for the development of museology in the Czech Republic. In case of introducing the new registration system the new methodological centre would be needed. The important question is the set of registration system itself and conditions for registration.

The last question is related to the plan of the Ministry of Culture to launch accreditation / registration system of all museums in the Czech Republic. It is clear that almost all regions would not appreciate the establishment of the new methodological centre for the accreditation / registration of museums. Only two regions (region 6 and region 10) think that the new methodological centre would be needed and useful.

5. CONCLUSIONS

The theories and practices of performance measurement have been advanced during the last two decades. However, there are no commonly accepted solutions to the issues of what should be measured, what can be measured and how to measure. Because of the features of art museums, these issues are more challenging.

The purpose of this thesis was mainly to invent a new performance measurement tool to evaluate the relative efficiency and productivity of regional art museums. First, the results from interviews indicate that the BSC can be applicable as a performance measurement tool for evaluating regional art museum's efficiency. This thesis also identifies the limitation of the BSC analysis and verifies that DEA can overcome the shortcomings of the BSC. Moreover, the results suggest that the integrated BSC-DEA model could overcome the limitation in existing BSC applications. For example, when solely using the BSC, it was impossible to make comparisons among DMUs because the BSC is not based on a mathematical model.

The thesis verifies the reasons for applying BSC-DEA as a diagnostic tool in the management's decision-making process. The focus of BSC-DEA is on highlighting individual DMUs that exhibit best practices rather than the central tendencies of the group as a whole. This approach allows museum managers to identify specific areas that need to be improved and offers solutions as to how improvements in efficiency can be made. Also, the BSC-DEA analysis can complement other methods used to evaluate a museum's productivity and efficiency and provide information not obtainable with other techniques. Thus, BSC-DEA appears to be a tool for identifying specific problems that a DMU might face.

The aims of this study were following:

- 1. Examine context (historical, business, mission, and operational) that influences the current managerial methods and attitudes in art museums with the focus to evaluation approach.**

This research aim was addressed through a literature review, development of the conceptual framework and empirical research. Data from the interviews was analyzed through cross-case analysis.

- 2. Introduce the performance measurement tool as the part of strategic decision-making in public art museums.**

The second aim of the research was fulfilled also through a literature review and empirical research and mainly through examination of existing evaluation methods.

3. Propose a comprehensive model to monitor and measure performance of regional art museums.

This aim was fulfilled through the proposed comprehensive model based on the combination of BSC and DEA. The model is described in the previous chapter

4. Examine the component parts of the suggested model for art museums to extend necessary to justify the inclusion of individual elements in the model, and examine the interrelationships and influences between the component parts.

Parts of the suggested model were examined in the previous chapter through DEA methodology. Quantitative data was obtained from the annual reports of regional art museums and from reports of NIPOS and then analyzed with DEA approach.

5.1 Revisiting Research Questions and Hypotheses

The research has aimed at answering following fundamental research questions.

- RQ1: What is the effective performance measurement system and tools for public art museums?**

This research question was address through the interviews and study of existing literature and strategic documents. Effective performance measurement system must incorporate both qualitative and quantitative criterions. This system has to be flexible in order to adopt it to the certain extend to the specific of each museum. Appropriate performance measurement system needs to include all museum activities. The system has to be also easy and understandable for all museum employees. Also it has to be inexpensive and easy to implement. From the facts mentioned above I consider the BSC as the appropriate tool for performance measurement of regional art museums.

- RQ2: How can public art museums implement the performance measurement system successfully?**

The second research question is linked with the implementation of the performance measurement system in museum management. Implementation of the BSC is quite easy and inexpensive. However, museums adopt this system on their own and do not consider it as a duty. All museum employees have to be familiar with the system and they should take part in the creation process of the system. Performance measurement and its results should be accessible for all employees and they all should participate in data collecting.

To address the two fundamental questions, the following were investigated:

- RQ3: What are the knowledge gaps in the current literature in regard to performance measurement for public art museums?**

There is a lack of museum performance measurement studies, therefore there has not been any agreed upon method. The combination of BSC and DEA has not been examined enough within the current literature. There is also lack of literature regarding museum management and museum economics in the Czech Republic. Most of the existing studies have been conducted only by economists. It would be a

challenge to combine the point of view of an economist and museum professional. It could bring interesting results.

- **RQ4: Can management improve the museum's activities efficiency using various assessment methods?**

Based on the data from interviews and experience of several museums with the BSC, it has been proved that using this tool can improve management of a museum, its decision making process, transparency and accountability. That way a museum can be trustful partner for fundraising and cooperation.

- **RQ5: What are the weaknesses and problems of the current management methods in museum management?**

Based on the result of cross-case analysis I discovered that the weakness of current management methods in museum is museum funding. Museums in the Czech Republic are not able to improve their self-financing. The lack of fundraising and narrow minded attitude in museum world does not help to solve this problem. Museum professionals should try new attitudes and techniques how to improve their funding and do not rely only upon state subsidies.

- **RQ6: What metrics and indicators should be measured?**

Indicators listed in the proposed model.

- **RQ7: How can art museum managers successfully measure and manage their performance?**

As mentioned above, performance measurement in art museums needs to be done with the respect to the specifics of museum activities. Performance measurement has to be based on the collection of appropriate data.

Two hypotheses were examined through quantitative research.

- **H1: Regional art museums located in the regions with the higher number of citizens are more efficient than the ones located in the regions with the lower number of citizens.**

The first hypothesis was not confirmed, so it means that there is no correlation between the number of inhabitants in the region and efficiency of a museum. The hypothesis was examined through DEA methodology.

- **H2: Regional art museums tend to be more efficient in the activities that are more visible for stakeholders.**

The second hypothesis was confirmed. The results obtained from DEA analysis show that regional art museums tend to be more efficient in the activities that are more visible for stakeholders. The highest number of regional art museums are fully efficient in the Public Perspective.

5.2 Contributions of the Study

The contributions of this study are both theoretical and practical. First of all, to my knowledge, there has been one PhD thesis about performance measurement in museums, but this thesis does not propose any managerial model, only set of indicators. And to my knowledge, there has not been any study analyzing efficiency of museums using DEA approach. This study is unique in terms of theoretical contribution, when applying BSC-DEA model is proposed. There is no agreed upon method to measure performance of art museums and this study is an attempt to propose one. Evaluation in culture is a rising topic nowadays and there a need to pay more attention to this issue.

From practical point of view, the study contributes to the field of museum management, since it aims at providing instruction how to adapt a performance measurement tool and how to use it within an art museum. A practical performance measurement tool for art museums has been developed, which answers the key questions: What is an effective performance measurement tool for art museums? What are the appropriate performance indicators to monitor? And how can be the model implemented?

5.3 Limitations of the Study

This study has several limitations, in particular in terms of research methodology. First of all, the study is restricted to regional art museums, which is really specific area. Therefore, for a quantitative research, sample of only 19 museums has been used. The reason for this choice was to select a homogenous group of units. I wanted to select DMUs with the similar governance, management, size and funding, and with the similar type of collection. Therefore I decided to focus my research on regional art museums.

Another limitation, linked with the previous one, is data collection. Even though triangular data resources were employed, the results and findings in this thesis may be biased because of the small responses in the questionnaire and the small number of interviewees.

As for quantitative research, bias would be arising from variables choice. Some important variables might not be considered, mainly because of the lack of data on art museums. In order to minimize the impact of this problem, the variables were selected after careful study of the literature and studies in this field. The proposed BSC-DEA model in this study takes into account only limited number of inputs and outputs, which may ignore other important measures of art museum activities. Mainly due to the limited access to data, many inputs and outputs that could be potentially included in the model have been ignored in this research.

Also, only one year of data was included in the analysis. Therefore, the results of the analysis cannot be generalized beyond the year.

Moreover, the interviews were based on the conceptual performance measurement framework, so the consequence of this may be that some important factors could be ignored in data collection. In order to minimize this effect, a lot of open questions were used in interviews.

5.4 Suggestions for Further Research

Even though I have tried to conduct a comprehensive research, there is still room for improvement and many suggestions for future research. First of all, future studies could focus on obtaining additional data from museum in order to provide a wider range of application of the BSC-DEA approach. Also it would be useful to use different indexes for BSC-DEA model which would be used as outputs. That way the wider range of museum activities would be covered. Also data from a long-term period would be useful for research focused more on efficiency of museums. The index taking into account the location of a museum and other conditions would be very useful for future research.

The huge gap could be filled with the research dedicated to the allocation efficiency that has not received so much attention in the field of cultural economics.

Even deeper investigation could be done in the field of measurement of a quality of exhibitions and collection. This would need more philosophical approach.

Finally, other performance measurement tools could be investigated and tested for museums.

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