

ISM UNIVERSITY OF MANAGEMENT AND ECONOMICS  
INTERNATIONAL MARKETING AND MANAGEMENT DEPARTMENT  
PROGRAMME

II year student  
Gintarė Latvytė .....  
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**THE IMPACT OF BUSINESS PROCESS MANAGEMENT ON  
AGILITY IN LARGE SIZE LITHUANIAN SERVICE  
ORGANIZATIONS**  
MASTER THESIS

Thesis advisor:  
Dr. Lineta Ramonienė

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## ABSTRACT

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**Purpose** – the purpose of this paper is to report results of the research that seeks to solve the problem issue of how organizational agility is influenced by business process management (BPM) in large size Lithuanian service organizations. Pyramid model of BPTrends is taken as a framework for analysis of BPM components (enterprise level, business process level and implementation level), while agility is describe as organizations capability to sense and seize opportunities that lead to competitive advantage.

**Design, methodology and approach**– data for quantitative analysis was gathered from specially selected 68 large size Lithuanian survey companies by employing on-line survey tool. The research itself establishes associations between variables and is descriptive in nature. Research model specify relationships between predictors (maturity level of BPM components) and criteria (ranking of organizations ability to sense and seize opportunities). Multiple regression tools were employed for statistical data analysis.

**Findings** – the results of empirical research have partially proved relationship model, suggested by literature analysis. In particular it indicated that maturity of enterprise and implementation levels in business process management have positive direct effects on opportunities sensing capability, whenever business process and implementation level maturity can cause positive direct effect on how good organization is about to seize the opportunities that were detected.

**Research limitations and implications** – the main limitation of the research is a relatively small sample size (68 out of 104) and narrow area of research population (large size Lithuanian service companies). Moreover, both maturity of BPM levels and organizational agility was evaluated by the same respondents which puts limitations on objective rating. Therefore, further researches should be replicated in and extended to other contexts.

**Practical implications** – the results can be useful for large size Lithuanian service companies that want to improve organizational agility. The study can help to identify the particular situation of the company and decide which areas need fixing.

**Originality / value** – the last few decades have shown that companies need to develop speed and efficiency while looking for new opportunities to satisfy their customers. As customers become more demanding and globalization together with e-commerce allows new brands to break through and usurp the market, new capabilities must be developed as to reach competitive advantage. Business process management is named as one of the tools that help to achieve this essential capability of organizational agility. Yet, there is a lack of studies that document these relationships. The paper provides local quantitative evidence of the critical BPM components that affect organizational agility positively.

**Keywords:** business process management, enterprise management, organizational agility, dynamic capabilities, business development.

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## Introduction

At the dawn of 1990s business world have acknowledged that the environment is changing faster than ever before. The days when a company could spend few years for R&D to launch one super-product and stay competitive in the market for years were over. Customers accelerated to demand more: they needed products and services with better quality, lower price, easier purchase and usage opportunities. Moreover, a new millennium have brought Internet era with e-commerce capabilities and unexplored challenges for business. In order to stay alive and grow, it became essential for organizations to respond quickly to changes and be one step further than their competitors and customers as well.

The natural need of all enterprises is to be profitable. To be more exact, in a face of crises companies seek for efficient processes while in the good times they look forward to expanding, becoming more productive and entering new markets (Harmon, 2007a). The crucial issue here is to hear what the stakeholders want and to manage serving their flux demands fast (Burlton, 2001; Harmon, 2007a; Fingar, 2012). This “ability to cope with rapid, relentless, and uncertain changes and thrive in a competitive environment of continually and unpredictably changing opportunities” is called organizational or enterprise agility (Lu and Ramamurthy, 2011, p. 932).

According to the results of survey, run by Economist Intelligence Unit, nearly 90% of respondents (CEO's and CIO's) believe that organizational agility is critical for business success (Glenn, 2009). Moreover, author quotes results of research conducted at the Massachusetts Institute of Technology, which suggests that agility is also linked to profitable growth as agile firms grow revenue 37% faster and generate 30% higher profits than non-agile ones. Therefore, searches for the path to become agile are very vivid nowadays. Practitioners are building methodologies, scholars are testing models and software providers – suggesting IT solutions for holistic integration of processes, data bases and internal systems. However, one of the most popular approach deals with management of business processes (Smith & Fingar, 2003; Jean-Noël, 2008; Neubauer, 2008; Burlton, 2001; Harmon, 2007a, Verma, 2009).

The interest of BPM is growing worldwide, including Lithuania as well. This phenomenon can be seen from the growing number of searches on Google, participants in BPTrend surveys (Harmon and Wolf, 2012) and even in annual Lithuanian conference for BPM practitioners (Verslo procesų valdymo praktika, 2012). Even though, most organizations still face the second level of Process

Maturity, which means that processes are improved at the Work Groups or in the departmental level (Harmon, 2007a; Harmon and Wolf, 2012). This issue raises questions for both business and academic society of whether BPM is really able to deliver agility for the companies.

Although there is no one common agreement of how to explain BPM and agility, in this research BPM is understood as a holistic management approach to align an organization's business process with the wants and needs of stakeholders (Burlton, 2001) and for description of organizational agility the definition by Mason-Jones is employed: "Agility means using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile marketplace" (2000, p. 4064). If properly used, agility should be the outcome of the BPM (Burlton, 2001; Singh, 2012). However, there is a lack of empirical researches that could prove this relationship both in Lithuanian and global perspective.

This research attempts to address the above gap in the literature. Precisely, the primary research **problem** asks how organizational agility is influenced by BPM in large size Lithuanian service organization. It contributes to the **aim** of the study to explore what impact BPM has on agility in large size Lithuanian service organizations. The further **objectives** are going to be covered in order to reach the purpose:

- To reveal the literary concept and theoretical nature of BPM
- To reveal the literary concept and theoretical nature of organizational agility;
- To suggest a conceptual model of relationship between independent variables of BPM and dependent variables of organizational agility;
- To measure empirically what impact BPM has on agility in large size Lithuanian service organizations;
- To formulate the recommendations of what BPM components can be used to reach organizational agility.

The following research is carried out in a deductive sequence. It starts with literature analysis, hypothesis building and then goes further for data collection, findings, hypothesis confirmation or rejection and revision of theory. Empirical research analyses the relationship of independent variables of BPM (enterprise, business process, implementation levels) and dependent variables of agility (opportunities' sensing and seizing capabilities). A non-experimental quantitative **research strategy** was chosen as it allows examining conceptual model in selected Lithuanian companies and find links between variables. Moreover, this kind of research increases objectivism and allows registering facts



without prejudice. Survey was chosen as a **method for data gathering** from selected sample of 82 BPM practitioners from large Lithuanian service organizations (response rate was 83%). Here *large* organization is treated as having more than 250 employees; *Lithuanian* means acting in Lithuanian market and *service* – selling services directly to consumer or other business.

The background of the research bibliography covers the most significant monographs that study business process managing, methodologies of process change, business process systems and organizational agility (G. Rummler, M. Hammer, P. Harmon, R. T. Burlton, H. Smith, P. Fingar, J. Chang, M. E. Porter, etc.) Deeper theory analysis covers the newest academic articles from Business Process Management Journal, Harvard Business Review, Strategic Management Journal, Quality Management Journal other academic periodicals and also web-journals for practitioners BPTrends and Process Excellence Institute.

## 1. Theoretical Background

The first part of the study is dedicated to theory-building and in-depth review of literature covering concepts of Business Process Management and Agility. This is the starting point needed as an input for examination of the link between factors of BPM and agility. The analysis begins with development of Business Process Management concept, covers building, implementation and evaluation of BPM, and extracts the core components. Thereafter, phenomena of organizational agility is described and assessed from the perspective of Market Capitalizing Agility and Operational Adjustment Agility.

### *1.1. The Concept of Business Process Management*

Business Process Management is quite a new term in business world. It was employed by practitioners and scientist at the end of XX century. However, the need to control and manage processes was known much earlier: Harmon has noticed some sights in early human cultural development (2007a), Chang has named Adam Smith (and his attempts to increase workers' productivity by division of labour) to be the pioneer of process management phenomena (2006), but mostly it is Fredrick Taylor, who is often named the “father” of operations research (Harmon, 2007a; Ruževičius, 2006; Chang, 2006, Fingar, 2012). In 1911 Frederic W. Taylor published Principles of Scientific Management where main focus is based on optimization of processes in order to remove production inefficiency and improve the labour results (Harmon, 2003, 2007a; Ruževičius, 2006; Chang, 2006, Fingar, 2012). However, there still is some confusion in definition of BPM. Moller et al. have noticed that BPM is a practice oriented concept with no academic foundation and there is no academic agreement upon conceptual framework (2009). In order to understand the origins of Business Process Management, definition of business process will be discussed first, then the historical overview of business process improvement methodologies will be given and, lastly, the composition of BPM concept will be built.

#### *1.1.1. Defining Business Process*

A basic description of Process is “a sequence of events that uses inputs to produce outputs” (Chang, 2006, p. 2). It means that every process has a beginning that is influenced by some kind of reason, such as document, request or output of previously ended process and transforms this input to

the new output. In the concept of business process, business is understood as “an organization or group of organizations with the purpose of providing goods, information or services” (Burlton et al., 2012). In his monograph Burlton also describes that this kind of organizations should be aiming to “create results of value for someone who cares about those results” (2001, p. 67). Author argues that every business is kind of transformation mechanism that transforms the needs of customers to products, services or other business outcomes that create benefit for the customer (Burlton, 2001, Verma, 2009). Therefore, business process is an asset of organization that combines other tangible and intangible assets of business with the purpose to create a change (Burlton, 2001; Chang, 2006; Seethamraju, 2012; Singh, 2012).

Researchers and practitioners distinguish few types of processes. Porter in his popular value chain suggests separating *primary* (e.g. inbound logistics, operations, service) and *supporting* (e.g. firm infrastructure, human resource management, procurement) process groups (Porter, 1998). He claims that competitive advantage can be gained in any of these areas, not necessarily the ones that produce products, but also in the ability to manage processes in efficient way. Other authors name three type of processes: *management* (e.g. corporate governance, strategic management), *operational* (e.g. purchasing, manufacturing, sales) and *supporting* (e.g. recruitment, technical support) processes (Singh, 2012) or *critical* (e.g. management and control of management systems), *key* (e.g. planning and improvement, creation and implementation of new serviced) and *support* (e.g. human resource and infrastructure management) ones (Olve et al., 2001; Ruževičius 2006). To sum up all of them, not every process in organization are of equal importance or create as much value for the customers. That is why it is important to understand the whole process map and links between business processes, to extract those processes that create most value, and make them competitive advantage of organization.

#### *1.1.2. Business Process Improvement Methodologies that Formed BPM approach*

As mentioned previously, attempts to manage business processes is older than the term BPM itself. It is commonly agreed that quality management, strategic management and business process automation have created favourable conditions for ecosystem of holistic management approach to develop. Harmon has distinguished business process management and improvement traditions into three groups: operations research / quality control tradition, strategic management and business process redesign tradition and IT tradition (2007a). All of them have made a significant impact on development of BPM and will be described in more detail.

#### *1.1.2.1. The influence of operations research and quality control tradition to BPM*

Theory of Frederic W. Taylor made an impact on further researches on quality control and management. In 1982 J. Juran and E. Deming published their books on the latter topics and so started the movement of Total Quality Management (Fingar, 2012; Ruževičius, 2006). TQM is commonly called as one of the management approaches that influenced the development of BPM (Burlton, 2001, Chang, 2006, Harmon, 2007a; Fingar, 2012). This is a management approach oriented to long-term goals and continuous development of company by changing simple production oriented viewpoint to customer driven one (Li, 2000; Ruževičius, 2006; Harmon, 2003, 2007a). TQM was a very popular management practice at the last decades of XX century. It is based on how people work and requires changes in human resources management as well as in empowerment to be task centred (Middleton, 2004), therefore companies, that decided to implement TQM faced huge challenges to change internal business culture and failed to deliver quick results in process efficiency.

Need to control quality of business processes stimulated development of many techniques. One of the most popular was quality improvement methodology called Six Sigma. It was introduced by Motorola in 1980s and gained success among manufacturing companies (Chakraborty and Tan, 2012). Harmon names Rummler-Brache approach (organizations as systems) and TQM the core influencers for Six Sigma to develop (2007a). Just like TQM, Six Sigma is a bottom-up management approach, aimed to bring process orientation to all employees in the company. Not surprisingly, support of management and team members emerged as primary success factors for successful implementation (Chakraborty and Tan, 2012). That is how Six Sigma grew to a comprehensive training program (Harmon, 2007a) that is still popular nowadays. One of the distinctive attributes of Six Sigma is concentration on data and statistic analysis which requires special skills and knowledge in the company as well as time for analysis and control in order to improve the specific process of one department. Therefore, today Six Sigma is mostly combined with other techniques and methodologies of process development. This helps to be applicable both in manufacturing and service companies (Harmon, 2007a; Chakraborty and Tan, 2012).

One of the popular combinations is Lean-Six Sigma (Harmon and Wolf, 2012). Lean methodology was developed by Toyota executive Taiichi Ohno and had a purpose to organize processes so that the company could do “more and more with less and less” (Womack and Jones, 2003, p.15), including all tangible and intangible resources. One of the outputs of lean thinking is a speed in delivering outputs (Mason-Jones et al., 2000). The main idea upon Lean-Six Sigma is to link data

driven decisions with the aim to get rid of waste activities that create no value for the customer. Lean thinking has also stimulated invention of widely known just-in-time manufacturing (JIT) that helps to optimise process efficiency for industrial organizations (Womack and Jones, 2003, p.15; Harmon, 2007a).

All in all, the central issue in mentioned quality improvement methodologies was capability to manage business processes by eliminating risk of mistakes, raising efficiency and involving whole organization. Trust on people, involvement in decision making, knowledge sharing and bottom-up execution was recognized as a key issue for performance efficiency.

#### *1.1.2.2. The impact of strategic management and business process redesign tradition on BPM*

The phenomenon that goes along with continuous process management is process improvement. Florian Foster has run a research in order to investigate causality behind Business Process Improvement (BPI) and build a framework of BPI patterns to serve as guidelines (2006). In his article author summarises that all different naming of attempts to make existing processes work better, are driven by changes. Foster builds his attitude towards BPI on three step holistic change model, introduced by psychologist Kurt Lewin (1958): (1) unfreeze existing situation (process modelling), (2) run change (process analysis and improvement), (3) refreeze changed process (process implementation) (p.3). Researcher also stresses the importance of performance measurement in process change and names cost (direct/indirect), time (amount of time that is actually needed to execute the task), quality (inherent or distinctive characteristics or properties of a person, object, or other thing) and flexibility (ability to react to changes) as crucial ones for BPI (p. 7). By employing these attributes to control changes in business processes, it becomes possible for “organizations to achieve significant changes in the way they do business” (p. 2).

Harmon, former employee and present follower of process guru Geary Rummler, acknowledges that management theories, such as system thinking and idea of value chain have also contributed in development of BPM (Harmon, 2007a). The keynote of systems perspective is that “everything is connected to everything” (Harmon, 2007a, p. 2). In other words, every single unit, activity, employee, customer or other internal or external entities depend to a larger entity and all of them have influence of each other. All types of resources of organization interact in organizational ecosystem and it is essential to find the point in which they all work well together (Warren, 2008). Looking from some perspective, systems thinking is similar to the generic value chain management approach, suggested by Porter (1998), as it includes all functions (also supporting areas), involved in the producing process in order to

have a clear understanding of the cost of final product and what margin is gained after selling (Harmon, 2007a).

According to Harmon, Rummler later adopted value chain and applied it to business processes. He added the starting (the need of customer) and lasting (satisfied need) points to the chain and made a single process flow (2007a). However, in practice there was a departmental issue that created challenges to hand off things from one department to another and the solution here was to manage processes holistically (Balzarova et al., 2004; Harmon, 2007a). Rummler and co-authors established a discipline commonly called Human Performance Technology (Harmon, 2007a). It became a guide of how to enhance the performance effectiveness in organizational, process and activity performance level. Tosti in his article names four HPT principles that should be taken into account: (1) start with results, (2) take a systematic view, (3) always create value, and (4) partner with others (2006).

To conclude, strategic management and business process redesigning tradition have cultivated continuous improvement and holistic management of all organization. It has raised the idea of customer centricity and draw business attention that short term decisions and moves do not guarantee dynamic growth and competitive advantages.

#### *1.1.2.2. Business process automation impact on BPM*

Thomas H. Davenport, James E. Short, Michael Hammer and some other authors draw attention of business to process automation (Chang, 2006). They have named information technology (IT) as a key enabler tool that should be used for business process improvement and control, because it can provide wide range of information. Moreover, automation of business process lowered costs, saved time and helped to prevent risk of human mistakes (Chang, 2006; Harmon, 2007a). Not surprisingly, the end of XX century IT brought the wave of process automation worldwide. The most influential movement here was business process reengineering (BPR).

According to Encyclopaedia of Production and Manufacturing Management, the essence of BPR is to “propose radical approaches to redefining work as processes, rather than tasks” (p. 71). Hammer argued that it is useless to automate existing processes that were created for manual work and hope for incremental changes: “instead of embedding outdated processes in silicon and software, we should obliterate them and start over” (Hammer, 1990). The interest on BPR reached the peak in 1995, when more than 500 publications went out (Deakins and Makgill, 1997). Nonetheless, the last years of 1990s have brought disappointment with BPR. The main reasons of that was tremendous scope of projects, huge costs, long execution and ignored people issue (Chang, 2006; Harmon, 2007a; Fingar,

2012). BPR had to be implemented by team work, which often failed due to understanding, that after the process is reengineered it will cause a downsizing. This negative flavour made business to look for other business process improvement issues that could encourage involvement of all organization (Harmon, 2007a).

Summarizing the tradition of IT, it can be said that business process automation have unveiled new opportunities for cost efficiency and expansion of productivity. This was a key for doing more with less; however, the need for quick moves didn't pay enough attention for integration with all systems and so created favourable conditions for silo management.

To put everything into account, historical overview of most process-focused business improvement, management and automation approaches have illustrated that all of them are the tools for managing processes of organization (Chang, 2006, p.; Harmon, 2007a). However, all prior-BPM technologies had shortages in full completeness, and thus "the term business process management was coined to suggest the emergence of a more synthetic, comprehensive approach to process change that combines the best of process management, redesign, process improvement and process automation" (Harmon, 2007a, p. 18).

### *1.1.3. The Composition of BPM Concept*

Searches for efficient way of business management have encouraged the development of BPM approach. Elzinga et al. (1995) are believed to be the first that used the term "business process management" officially. However, this was the early stage still concentrated on quality improvement. Failures with implementing process redesign technologies, mostly BPR, and costly department level business process automation that led to rigidity have invoked the new trend of integration (Seethamraju R., 2012; Harmon, 2007a). It was mostly stimulated by IT vendors. They have started to build Business Process Management System (BPMS) that could enable coordination of day-to-day activities, performed by people and software applications (Harmon, 2007a). Peter Fingar, the co-author of the book *Business Process Management: The Third Wave*, have later noticed that "Feedback of results, agility and adaptability are the bywords of the third wave" (2012, p. 2–3). He has also stressed that agility is inherent from innovation which must be done as a respond to changing needs of stakeholders and which is the core issue of the fourth wave. Several studies have been made in order to build a framework for implementation of BPM. This part of literature review distinguishes important factors that stimulates process based management, describes separate levels of this approach and concludes with the framework of BPM concept.

#### *1.1.3.1. BPM drivers*

As previously stated, BPM approach was developed from the eternal business need to be efficient. Some drivers were part of discussed in previous chapters, nonetheless, it is important to classify them in order to build a research model. Although, there are different insights, the analysis of literature have shown, that many authors agree on the most influential causes for BPM employment. They are as follows:

- Aim for cost leadership (Harmon and Wolf, 2012; Burlton, 2001; Harmon, 2007a)
- Need for business process optimization (Harmon and Wolf, 2012; Burlton, 2001; Singh, 2012)
- Concentration on customer satisfaction (Harmon and Wolf, 2012; Pritchard, 1999; Burlotn, 2001)
- Demand for better organizational / managerial responsiveness (Harmon and Wolf, 2012; Pritchard, 1999; Seethamaraju, 2012; Singh, 2012)
- Need for improvement in business coordination and control (Harmon and Wolf, 2012; Pritchard, 1999; Singh, 2012)
- Need to manage risks (Harmon and Wolf, 2012; Singh, 2012)

Those organizations that succeed in implementing process based management gain many advantages, such as agility, speed in decision making, shorten time-to-market and prolonged time-in-market, effective information's transforming to knowledge and improved customer experience (Burlton, 2001; Harmon, 2007a; Singh, 2012).

#### *1.1.3.2. Maturity of BPM in organizations*

Roger Burlton, so called guru of processes, have described BPM itself as “a process that ensures continued improvement in an organization’s performance” (2001, p.73). From this perspective, and the understanding that the results of a process come at the end point, it can be said that BPM must be developed in the organization. Moreover, if we employ the former analyzed approach that process improvement should be based on the feedback of stakeholders, it can be claimed that BPM must mature. These findings are supported by Capability Maturity Model (CMM) developed by Software Engineering Institute in 1990s. CMM is also used in BPTrends Associate Methodology that is based on practical experience and research of BPTrends Associates principals and founders, Paul Harmon and Roger Burlton. Harmon points out the ahead listed CMM stages of organization’s maturity (2007a):



1. Initial stage. The process is ad hoc. Few activities are explicitly defined and success depends on individual effort and heroics.
2. Repeatable stage. Basic project management processes are established to track cost, schedule, and functionality. The necessary discipline is in place to repeat earlier success.
3. Defined stage. The process for both management and engineering is documented, standardized, and integrated by an organizational methodology.
4. Managed stage. Detailed measures of the process and product quality are collected. Both the process and products are quantitatively understood and controlled.
5. Continuous process improvement is enabled by quantitative feedback for the process and from piloting innovative new ideas and technologies (p. XXXIV).

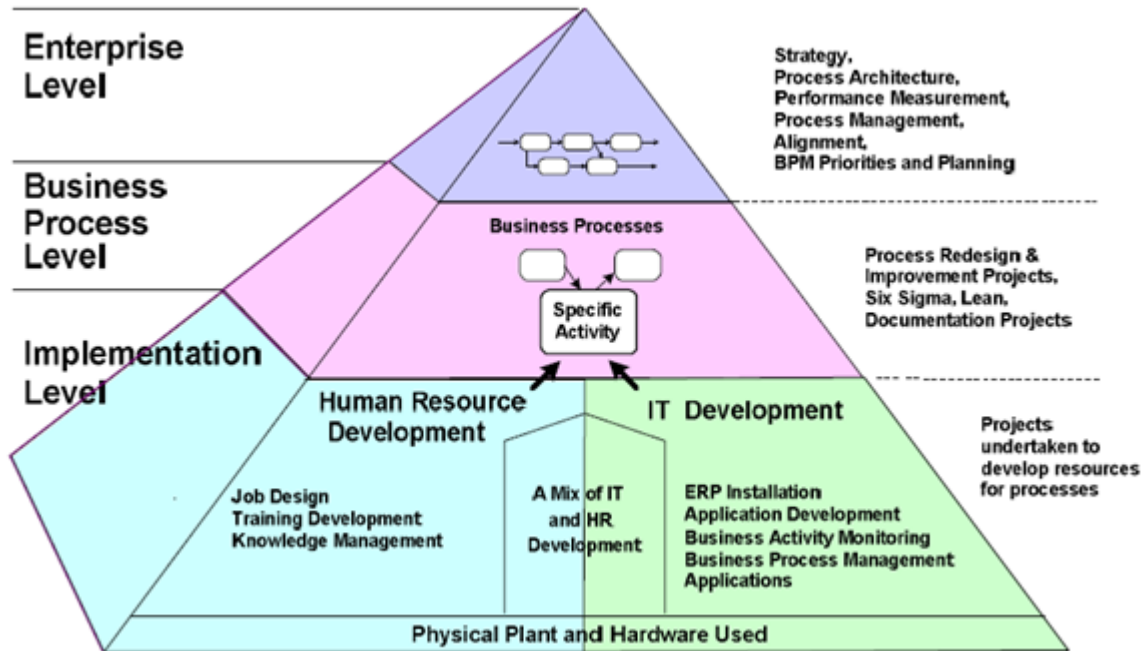
CMM is not the only model that describes the journey to excellent performance of the company. For example, MacCormack et al. use four-level model: (1) Ad hoc, (2) Defined, (3) Linked, and (4) Integrated (2009). What is important here is that it is needed to plan the growth of organizational excellence in the long-term strategy of the organization (Balzarova et al., 2004).

The annual research of BPTrends has shown that most of organizations are somewhere between the second and the third maturity level (in CMM) and have potential to grow (Harmon and Wolf, 2012). This present situation draws attention that business needs guidelines; therefore, the framework of how business process should be managed in organization is needed.

#### *1.1.3.3. BPM framework*

The same Associates of BPTrends have provided one of the most popular visual BPM concepts explanations between practitioners. It is shown in Figure 1. This framework is based on two methodologies: (1) enterprise level and (2) process level. The first one encompasses one stage (enterprise level) activities that create tools to enable executives and BPM centres of excellence to manage the enterprise, while a second one covers two levels: activities that are required to redesign specific processes (business process level) and implement changes (implementation level). From the CMM perspective, less matured organizations (1–2 levels) focus on process level methodologies while more matured ones (3–4 levels) focus on creating business process architecture that should help manage and prioritize the entire enterprise's process effort (Harmon, 2007 b).

**Figure 1. BPTrends' pyramid and levels of corporate BP activities**



Source: Harmon and Wolf (2012, p. 57)

Enterprise level in BPM pyramid is the strategic and guiding one – not dependent on any specific day-to-day process execution. This level doesn't cover strategy creation either, but it aligns strategy with processes (Harmon and Wolf, 2012). Harmon suggests that this stage should include (1) understanding of enterprise (business model, value chains, alignment to strategy), (2) defining a business process architecture (major processes' models, KPIs, alignment of resources to processes), (3) refining process governance (identification of process managers, managers scorecards, BPM group / centre of excellence) and (4) managing day-to-day enterprise processes (monitoring of processes and process managers performance) (2007a). This explanation shows that enterprise level also cover first two enablers for agility, identified by Alberts and Hayes (in Holsapple and Li, 2008): organizational structure, and command and control approach.

Enterprise level issues are the ones that have been described as key success factors that assure sustainable management of an organization's process assets (Burlton, 2011). The observation of successful organizations has shown that all of them meet the following criteria:

- Concentrate on strategic performance objectives.

- Trace business performance.
- Manage all actions and capabilities of organization holistically.
- Use outside-in approach (needs of stakeholders drive changes).
- Have standardized terminology and principles of process management
- Use comprehensive methodology (cover and link together all levels of processes)
- Apply BPM governance framework.
- Ensure involvement of all organization.
- Use Centre of Excellence.

Importance of clear guidance, leadership and top management support was also found important for process based management implementation by Balzarova et al. (2004). Enterprise level issues cover the way things must be done in organization. It also defines the flows and the rules, provides support.

The second methodology in analyzed framework is of process level. As it was mentioned, it consists of two stages first of which is business process level – the one that capture change projects. It covers business process optimization, documentation and creation of new processes. Organizations can employ any known business process improvement methodology (Lean, Six-Sigma, TQM, etc.), or to create the one that fits them best. If well-orchestrated, business process level should be the impetus for organizational agility.

Burlton have suggested a Process Management Framework that overlay eight important steps (2001):

- Business context phase (must ensure that change is based on business drivers)
- Architect and align phase (identify dependencies on other processes, resources and capabilities)
- Vision phase (identify the needs of stakeholders and plan change project)
- Understand phase (explore as-is situation by measuring performance, determining root causes and implement quick wins)
- Renew phase (model the renewed process)
- Develop phase (prepare for implementation by building tools and infrastructure, developing rules and training capabilities)
- Implement phase (prepare for testing, educate management and staff, run marketing programs, roll out changes)
- Nurture and Continuously improve phase (measure performance, make adjustment, find opportunities for improvements, adopt solution)

The above mentioned model is designed to be performance driven and bring value for the organization's stakeholders. This is a universal methodology that does not require always to be used in full capacity. A simpler model was developed by Harmon (2007a, p. 60). His guidance for business process improvement covered five stages: (1) understand the project (the goal), (2) analyze business process (as-is situation), (3) redesign business process (to-be), (4) implement redesigned business process (assign projects for IT and HR) and (5) roll-out redesigned process. The similarity is obvious and it also can be seen in other improvement models.

Lastly, implementation level in process level methodology deals with resources, needed to implement process change projects. Resources can be divided in IT (process automation projects, enterprise management systems, business process management applications, notations, business activity monitoring) and HR (job design, training development, knowledge management). Some of change projects can deal only with one of them, but mostly both resources are employed. This is kind of support and infrastructure level. Even though in some organizations process management is driven from IT department, BPTrends methodology suggests not going too deep into technical implementation level methodologies (Harmon, 2007b). Resources should be chosen and implemented with a demand of business processes and their development, not vice versa.

BPTrends Pyramid framework suggests that in order to succeed from BPM a holistic approach must be engaged. Even though there are no arrows in the model that would demonstrate the trends, BPTrends stress the importance of top-down movement: only when strategy is combined with process architecture and the alignment is clear it is time to start process redesign and quality improvement projects (e.g. using Lean Six Sigma or other methodology). Also, only when the aim, scope and improvement plan of project is described, it the time comes for implementation of changes in IT infrastructure and with employees.

Summarizing all literature analysis of BPM it can be said that BPM is a holistic management approach that helps to align an organization's business process with the wants and needs of stakeholders. It is built from strategic management, business process improvement, quality control and business process automation traditions that all aimed to make organizations work efficiently. BPTrend Pyramid model encompasses all these areas and provides a visual concept of process based management. All three levels (enterprise, business process and implementation) have influence on organizations ability to deal with turbulent environment, therefore maturity level of those three

components in research model will be treated as independent variables that seek to analyse the impact of BPM on agility.

## 1.2. *The Concept of Organizational Agility*

As the first part of theoretical background was dedicated for analysis of BPM, the second one is about to reveal the literary concept and theoretical nature of organizational agility building. Just like mentioned in the introduction, agility is ability of organizations to cope with rapid, relentless, and uncertain changes and thrive in a competitive environment of continually and unpredictably changing opportunities. It is a unique capability that can assure competitive advantage of organizations. However, the concept of agility is complicated by the context in which it is used and studied. That is why it is needed look how the term of organizational agility developed and how it is composed.

### 1.2.1. *Agility Term Development*

The term agility has become extremely popular among business people in the past few years. It is commonly agreed both by academics and entrepreneurs that agility is an imperative for success of contemporary firms in a turbulent environment. Briefly, agility is understood as the ability of a company to react to changing environment quickly and efficiently (Jeston and Neils, 2010; Burlton, 2001; Glenn, 2009; Organizational Agility, 2012; Rodica, 2009). A recent research of Project Management Institute has shown that most business people associate agility with a:

- Quick response to strategic opportunities (75%),
- Shorter decision / production / review cycles (64%),
- Focus on change management (59%),
- Integrating voice of the customer (54%),
- Focus on risk management (53%) and
- Other issues (Organizational Agility, 2012).

Nonetheless, there are many other words that are often used to describe the same things, for example, flexibility, adaptability, responsiveness. Even more confusion is made by the way the term *agility* is applied – stand alone or in corporation with such terms as *business* (Goodhue et al., 2009), *enterprise* (Rodica, 2009; Yang and Liu, 2012), *organization* (Holsapple and Li, 2008), *manufacturing* (Naylor, et al., 1999; Wang, 2010), *system / IT* (Jeston and Neils, 2010; Goodhue et al., 2009; Yauch, C. A. 2011), *supply-chain* (Yauch, C. A. 2011; Baramichai et al., 2007) and others. The way how agility term is used depends on the study field and this also determines what outputs are expected for

agile organizations. Some of the most popular combinations—manufacturing agility, IT agility, supply-chain agility—are about to be described in ahead coming part of the study.

#### *1.2.1.1. The relationship of manufacturing agility with organizational agility*

Since the end of XX century, a bunch of publications and studies, including empirical ones, approved the impacts of agility to business performance (Holsapple and Li, 2008; Goodhue *et al.*; Li *et al.*, 2008). The first attempts to describe and analyze agility came from manufacturing field (Holsapple and Li, 2008; Yaghoubi, N. M. *et al.*, 2011; Yauch, C. A., 2011). Iacocca institute is one of the firsts that officially escalated the idea of agile manufacturing in 1991 (Nagel and Dove, 1991). Even though these insights and recommendations were more assigned to U.S. market—experiencing huge global challenges—the main idea of agile or intelligent manufacturing can be suitable for any company: agility is accomplished by integrating three resources, such as (1) technology, (2) management and (3) work force, into a coordinated interdependent system (Nagel and Dove, 1991). However, Holsapple and Li (2008), notices that despite its impact on agility researches, the concept of agility, suggested by Iacocca lacks of accuracy and validity on business management theory.

According to Holsapple and Li (2008), manufacturing definitions of agility emphasize two points of agility: (1) a firm operates in a changing competitive environment, and (2) the firm can achieve benefits for itself and its customers if taken effective actions (2008). Wang and Koh also noted that agile manufacturing is driven by external factors and engages internal capabilities in order to take advantage of changes as opportunities (2010). Moreover, author distinguishes two interconnected main processes: (1) the development of innovative products, and (2) the manufacturing and distribution of these products. These ordinary processes of every manufacturing organization can make it agile only if lead-time requirements (such as time-to-market, time-to-volume and delivery time) and flexibility requirements (such as ability to meet market opportunities and respond to market demands) are met (Wang and Koh, 2010).

To sum up, definition of manufacturing agility shows that agility is the capability of transforming volatile demand inputs into supply outputs and so cause organization an output of competitive advantage of fast response.

#### *1.2.1.2. The relationship of IT / system agility with agility of organization*

Report of Iacocca has also raised the idea that agile enterprises need to be totally integrated. By claiming so, authors of the report state that integration covers both software and hardware technologies

that unify organization cross-functionally (Nagel and Dove, 1991). Goodhue et al. have proved empirically that systems agility is a critical component of organizational agility (2009). The research has been stimulated by the raising uncertainty on whether IT infrastructure increases or interfere responsiveness. Authors notice that sceptics claim benefits of enterprise systems to come along with increased complexity and difficulty of changing systems just-on-time when the change is urgent (Goodhue et al., 2009). This phenomenon was already briefly mentioned in this study while analysing business process automation consequences in chapter 1.1.3. (The Composition of BPM Concept, p. 15–17).

IT agility is considered to be the internal capability of the organization to make changes happen quickly. This leads to a second constrain of systems agility: being oriented to specific process (e.g. software or product development) and do not taking into account how this will interact with entire organization (Yauch, C. A., 2011). Therefore, Yauch represented two approaches that should help gaining organizational agility from IT agility: (1) IT system changes should follow business system changes, and (2) assuring technical complexity, programmer capability and software testing requirements (2011).

Besides important attention drawn to the role of IT in the performance of organization, from the systematic point of view the explanation of agility still lacked the reaction to external factors, such as customers' demand changes, globalization, on-line business and so on. Lu and Ramamurthy have tried to cover this issue and tested empirically how IT can enable organizational agility via building and enhancing IT capabilities. The results have shown that IT capability enables organization to be agile in both internal and external environment. Nonetheless, spending on IT does not lead to greater agility (2011).

On the whole, usually IT or systems agility is more the implementation and internal resources management tool than the capability to sense changing demand or new opportunities. If IT is integrated with business processes and is easy transformable, it can be a springboard for more rapid demand fulfilment.

#### *1.2.1.3. The relationship of supply-chain agility with organizational agility*

Another often met combined term is supply chain agility. Basically, it is used to describe supply chains that are agile. According to Baramichai et al. agile supply chain integrates business partners with the aim to enable new competencies which are a must for being able to respond to rapidly changing and continually fragmenting markets (2007). An agile supply chain phenomenon also has

origins in manufacturing industries. It was developed along with Toyota Production System, called Lean (Cecere, 2009). As it was written in chapter, analysing business process management, Lean is one of the methodologies used for business process improvement. In other words, Lora Cecere kind of supports the relationship between business process management and agility that is predicted in this study. Mason-Jones et al. claim that “agility should be the goal of an enterprise and leanness” and offers to start building lean supply chain before focusing on agility (2000, p. 4064). Nevertheless, authors of the article draw attention to the fact that leanness and agility might conflict sometimes; therefore Mason-Jones et al. offers to engage a new type of supply chain–leagile:

*Leagile is the combination of lean and agile paradigms within a total supply chain strategy by positioning the decoupling point so as to best suit the need for responding to a volatile demand downstream yet providing level scheduling upstream from the marketplace* (2000, p. 4064)

This paradigm is believed to help organizations develop speed and quality to meet customer demand. All of these factors are also included in the definition of agility by enterprise strategist Lora Cecere. Moreover, the author stresses the importance of demand’s variability (2009). Possible enablers of agile supply chain are (1) dynamics of structures and relationship configuration, (2) the end-to-end visibility of information, and (3) the event-driven and event-based management.

Altogether, agile supply chains are thought to be one of the most important enablers for enterprise agility (Baramichai et al., 2007; Cecere, 2009; Li et al., 2008). They combine both external factors of environment and internal factors of organization in order to provide business with competitive advantage.

Taking all discussed contexts of agility into account, it can be claimed that organizational agility is gained in many different activities and capabilities of organizations. However, stand alone, they do not ensure that the company will be agile as well. In order to achieve organizational agility, the holistic management of supply or even value chains is needed. Academic researchers suggest that systems agility and agile supply chains have the most important influence for holistic agility of the organization.

### *1.2.2. The Composition of Organizational Agility Concept*

Previous analysis of agility in manufacturing, IT, and supply-chain contexts have provided us with understanding of how assuring agile functioning of separate units in organization can contribute in



overall agility of business. The following part of study is about to go deeper to capability analysis and then compose the concept of organizational agility that will be used in research.

The importance to seek for over-arching agile organizational performance has origin in entrepreneurship and strategic management disciplines. It tells us that in order to gain competitive advantage, organizations not only need to settle with exploiting existing internal and external firm-specific capabilities, but they need to develop new ones likewise (Teece et al., 1997). According to corporate strategy and innovation guru David J. Teece, “dynamic capability is a meta-competence that transcends operational competence. It enables firms not just to invent, but also to innovate profitably” (2007, p. 1344). The difference between “dynamic” and ordinary (“operational”) capabilities is that the former are concerned with change (Winter, 2002). To be more precise, “dynamic” deals with responses that are required “when time-to-market and timing are critical, the rate of technological change is rapid, and the nature of future competition and markets is difficult to determine” (Teece et al., 1997, p. 515). It can be seen that the particular environmental conditions, needed for dynamic capabilities to exist, contribute to the ones that were named as drivers of business process management in the first part of literature review.

According to dynamic capability theory, these kinds of capabilities are activities, combined by the hardly replicated management’s ability to sense and then seize opportunities, repress threats, and combine, reconfigure specialized assets with co-specialized ones in order to satisfy customer needs. Sustainability and reusability on turbulent demand here is crucial. It is important to mention, that dynamic capabilities is also the ability to sustain evolutionary fitness and so build long-run value for investors. Teece concludes that dynamic capabilities create competitive advantage, only if all combination is fulfilled: the sense, the respond and the continuity (2007).

To put in briefly, definition of dynamic capabilities corresponds to definition of organizational agility as both of them are the abilities of business to exploit extrinsic signals in order to perform efficiently in volatile environment. Even though organizational agility does not stress the importance of continuity, it does have it in concept as agility is both short and long term aim of organizations. Therefore it can be claimed, that organizational agility is a dynamic capability. With this statement we start building the concept of organizational agility.

As it was previously noticed in this study, systems agility and supply chain agility are the key enablers of organizational agility. Iacocca institute have named technology, management and workforce as the most important ones (Nagel and Dove, 1991). Practitioners seem to be even more into

details. They pick out process efficiency, knowledge management and information sharing, encouraging or extending collaboration across the business and beyond, scenario planning and preparing for market changes, employee productivity, and cross-functional teams, etc. (Glenn, 2009). Alberts and Hayes (in Holsapple and Li, 2008) summarizes most of organizational agility enablers in four groups: (1) organizational structure, (2) command and control approach, (3) concepts of operation, (4) supporting system, and (5) personnel that have synergistic mix of the “right” characteristics. This variety of agility influences covers all three levels of BPTrend pyramid and prompts out that business process management can cause organizational agility. On the other hand, Teece et al. stress the importance of firm’s unique processes and capabilities which raise doubts if there can be one-fits-all solution (1997). And yet, most of authors, analysing agility, distinguish two common components: (1) catching external opportunities that are not yet recognized in the market, and (2) implementing changes quicker than competitors (Teece et al., 1997; Holsapple and Li, 2008; Rodica, 2009; Lu and Ramamurthy, 2011; Yang and Liu, 2012).

According to Holsapple and Li, the concept of agility is constructed by two main components: (1) alertness to changes and (2) responsive capabilities to changes (2008). The former is an opportunity-seeking capability from internal and external superiority points. Alertness is considered to be made of two specific capabilities: (a) strategic foresight (ability to anticipate discontinuities in the marketplace, sense threats and opportunities) and (b) systemic insight (capability to consider interconnections between the organization’s capabilities and emerging market opportunities). The latter component in agility concept is response to changes capability which is integrated in organizational processes. Responsive capabilities to opportunities and disturbances are also set from two capabilities: (a) capability to select actions and (b) capability to enable actions. Briefly, agility, according to Holsapple and Li, is all about sensing when the time for changes has come and implementing needed changes fluently.

Lu and Ramamurthy, based on theories by Dove (2001), Sambamurthy et al. (2003) and Volberda (1996, 1997), have also identified two types of agility: (1) market capitalizing and (2) operational adjustment (2011). The first one is about being able to respond and capitalize on external changes fast. This kind of agility can be reached through continuous observations and quick improvements of products or services. Market capitalizing agility is characterised as intellectual ability or a dynamic, change accepting and growth-oriented mind set, that helps to set strategic direction and make decisions as well as judgements in uncertain conditions. This capability is proactive and involves

(a) storage of extensive amounts and variety of information, (b) identification of opportunities and needed changes, (c) continuous monitoring activities and (d) quick improvements according to customer needs. Features of market capitalizing agility, listed above, supports relationship with all three components of business process management, as enterprise level activities (from BPTrend framework) can be associated with (a), (b) and (c), while business process level can be compared with (d). The second type of agility, operational adjustment agility, is about organization being able to cope with internal business processes in order to react fast on changing market demand. In this case flexible and rapidly responding operations are a critical foundation that enables fast and fluid realization of innovate initiatives when changes are needed. Operational adjustment agility is reactive in nature and focused on operational activities (Lu and Ramamurthy, 2011). This statement matches business process and implementation level activities in business process management approach and prompts that operational adjustment agility may have a direct relationship with these activities.

Yang and Liu have also supported his bi-type view by naming two approaches of enterprise agility: (1) internal capabilities or passive perspective (2) and external perspective (2012). They add that internal capabilities mostly seek for cost efficiency, quality improvement, dependability and flexibility, while external ones can bring ability to sense unexpected changes and respond to them quickly. Here, again, internal capabilities are concentrated on operations and suits business process level activities just as well as the ones from implementation level, while external perspective could be more equated to enterprise and business process level activities.

If to go back to definition of dynamic capabilities, it can be said, that discussed factors of alertness to changes, market capitalizing agility or external perspective capabilities are the same as what Teece calls ability to sense opportunities and the need of changes. Therefore in this study the first component of the organizational agility is named “opportunities’ sensing capability”. As well, responsive capabilities to changes, operational adjustment agility or internal capabilities goes along with Teece’s seize of opportunities. Due to this fact the second component of organizational agility was called “opportunities’ seizing capability”. The composition of organizational agility concept used in these theses is illustrated in Figure 2. If a company or institution holds both of these capabilities, it can successfully innovate its products or services and so meet the needs of customer on time.

**Figure 2. The composition of organizational agility concept**



Concluding the theoretical background of agility it can be once again noticed that the concept of organizational agility is an ability to use internal capabilities, such as market knowledge and a virtual corporation with the aim to exploit profitable opportunities in a turbulent marketplace. Similarities in BPM components and organizational agility enablers are very close to each others, therefore, it can be assumed, that there should be a relationship between them. As mentioned in the first part of theory analysis, organizations, practicing BPM, should succeed in becoming agile. Due to this concern, distinguished components of organizational agility—to name opportunities' sensing and opportunities' seizing capabilities—are going to be treated as depend variables in the forthcoming empirical test.

## 2. Research Problem Definition

Previous analysis of literature has spotlighted the volatility of business environment that have heightened in the past few decades. Hyper-competition, growing organizational complexity and reach, rising external stakeholder power, e-business technology and globalisation has made business practitioners and scholars understand that special dynamic capabilities are needed in order to survive and thrive in such conditions. Business process management (BPM) was one of the approaches developed seeking to help business become agile. As it was mentioned at the end of the first part of literature analysis, BPM is a holistic management approach that aims to align an organization's business process with the wants and needs of stakeholders (p. 20). Whereas agility of organization is understood as unique ability to engage internal capabilities, in order to find and exploit profitable opportunities in a turbulent marketplace (p. 28). This part of thesis is about to describe all variables that are going to be used in the research, formulate hypothesis and suggest a conceptual model of relationship between independent variables of BPM and dependent variables of organizational agility.

### *2.1. The Relationship Between BPM and Agility of Organization*

Literature review have shown that both BPM and organizational agility talk about the same – how to enable organization being responsive and effective in rapidly changing environment. The main difference is that BPM is suggesting the approach of management while enterprise agility describes the capabilities of organization. Thereupon, it can be stated that BPM is the enabler of enterprise agility. In other words, engaging with BPM philosophy organizations can succeed in becoming agile which then creates competitive advantage and assures profitability. This statement suggests that BPM provides independent variables (maturity of enterprise, business process and implementation levels) that influence dependent variables of enterprise agility (opportunities' sensing capability and opportunities' seizing capability). However, the above mentioned relationship is unexplored at all. This research aims to eliminate the shortage and empirically prove which factors of BPM have the strongest influence on agility. Table 1 represents all variables that are about to be used in empirical study.

**Table 1. Research variables**

<b>Construct</b>	<b>Type</b>	<b>Operational definition</b>	<b>Supporting Literature</b>
<b>BPM enterprise level maturity</b>	Independent	Scope of activities that occur at higher levels in the organization and are independent of any specific day-to-day processes. Enterprise level activities focus on aligning strategy and processes and drawing a big picture of business process environment and management in the organization. The more activities are used, the higher the maturity is	Harmon and Wolf, 2012; Harmon, 2007a, 2007b; Balzarova et. al. (2004); Burlton, 2011.
<b>BPM business process level maturity</b>	Independent	Scope of activities that are organized into projects and enables changes in the organization with the aim to document, create, redesign or improve processes. The more activities are used, the higher the maturity is.	Burlton, 2001; Harmon, 2007a, 2007b.
<b>BPM implementation level maturity</b>	Independent	Scope of activities that engage human and IT resources needed to implement process change projects. The more activities are used, the higher the maturity is.	Burlton, 2001; Harmon, 2007a, 2007b; Harmon and Wolf, 2012
<b>Opportunities' sensing capability</b>	Dependent	An organization's ability to quickly sense efficient opportunities by continuous storage and processing of information, and improving product/service with the aim to address customers' needs.	Teece <i>et al.</i> , 1997; Holsapple and Li, 2008; Rodica, 2009; Lu and Ramamurthy, 2011; Yang and Liu, 2012
<b>Opportunities' seizing capability</b>	Dependent	An organization's ability in its internal business processes to physically and rapidly deal with market or demand changes.	

As the problem faced in this thesis is the wonder how organizational agility is influenced by BPM in large Lithuanian service organization, it is important to investigate the possible influence of each predictor to each of the consequential one.

## 2.2. *Hypotheses Formulation and Research Model Building*

Considering operational definitions, given in the Table 1, BPTrend Pyramid framework analysis (p. 18–19) and concepts organizational agility building (p. 24–27), the following conclusions were made:

- Enterprise level BPM activities are the starting point for organization to prepare for sensing and seizing the growing needs for unpredicted changes. Standardization of practices and using of portfolio management can increase agility as much as three times (Glenn, 2009; Organizational Agility, 2012). Authors, analyzing composition of organizational agility suggest, that enterprise level agility should have stronger influence on opportunities' sensing capabilities (Lu and Ramamurthy, 2011; Yang and Liu, 2012), while explorers of BPM envision that enterprise level activities prepare for operational ones (Harmon, 2007a; Burlton, 2012; Harmon and Wolf, 2012), therefore they should be also treated as influencers of opportunities' seizing capabilities.

- Business process level in BPM methodology is the most performance oriented stage that organizes and drives changes. The quality of how process project is made deals with the ability to meet needs of product or service improvements required by the customers, as well, as it indicates how flexible business processes are to rapidly adapt for new demands. Effective change management can increase success in becoming agile. To go deeper, business process level activities are believed to be of equal importance both to opportunities' sensing and seizing capabilities (Lu and Ramamurthy, 2011; Yang and Liu, 2012; Harmon, 2007; Harmon and Wolf, 2012).
- Implementation level involve two agility enablers: supporting system, and personnel that have synergistic mix of the "right" characteristics. Improving knowledge management and information sharing processes as well as assuring IT integration with business processes have a direct impact on how organization storages, analysis and transforms information to changes and opportunities. Maturity of implementation level activities is more believed to make influence on opportunities' seizing capabilities (Yang and Liu, 2012; Harmon, 2007; Harmon and Wolf, 2012), however, there also some relationship noticed with opportunities' sensing capability as well (Lu and Ramamurthy, 2011).

Based on the above given assertions, six following hypotheses for the research were derived:

*H1: BPM enterprise level maturity is positively associated with opportunities' sensing capability*

*H2: BPM enterprise level maturity is positively associated with opportunities' seizing capability.*

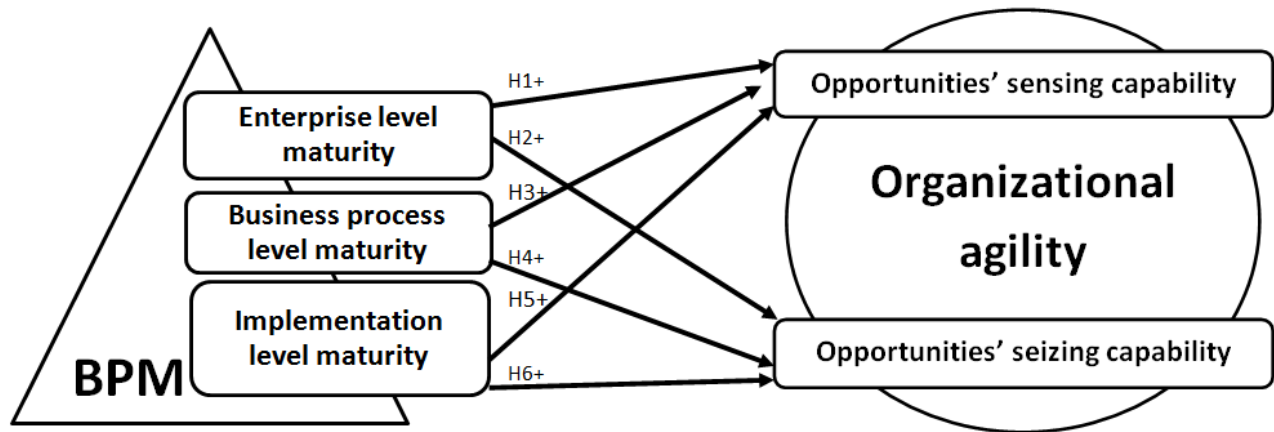
*H3: BPM business process level maturity is positively associated with opportunities' sensing capability*

*H4: BPM business process level maturity is positively associated with opportunities' seizing capability.*

*H5: BPM implementation level maturity is positively associated with opportunities' sensing capability*

*H6: BPM implementation level maturity is positively associated with opportunities' seizing capability.*

**Figure 3. Research model of BPM impact on organizational agility**



The visualization of hypotheses and impact of independent BPM variables on dependent variables of organizational agility is shown in Figure 3. The body of BPM is constructed based on BPTrends' Pyramid and levels of corporate BP activities (Harmon and Wolf, 2012), while the construction of organizational agility is made by author of this thesis according to the findings in the literature, analysing concepts of agility. Given model is about to be used in order to investigate what impact BPM has on agility in large size Lithuanian service organizations.



### 3. Justification of Methodological Approach

The first two chapters of this thesis were dedicated to the theoretical background and analysis of research problem. First, literally concept of business process management and organizational agility was revealed. Then, a conceptual model of relationship between independent components of these two phenomena's was suggested. The following part is about to describe and motivate the methodology chosen for the research. The chapter starts with justification of research strategy, design and clarification of sequence. Then, a chosen data gathering methodology is introduced and hypothesis testing questions are lined up. This chapter also delineates a sample of the population that was used in the research and explains how it was composed. Moreover, data analysis and research credibility verifying issues are pointed out. Lastly, reliability, validity and data aggregation questions of chosen research technique are discussed.

#### 3.1. *Justification of Research Strategy, Design and Sequence*

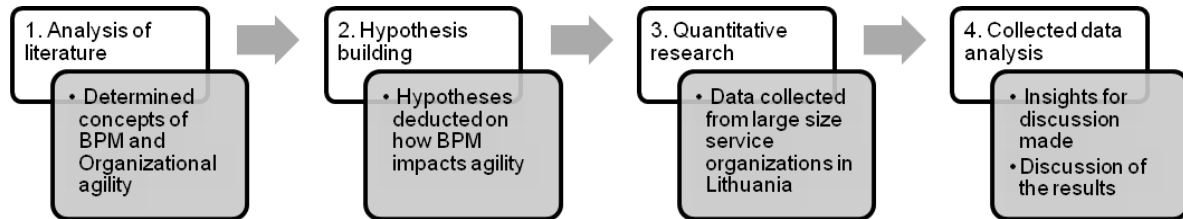
The purpose of empirical research is to gather and analyse data that is needed to solve research problem. Precisely for this case, the problem is how organizational agility is influenced by BPM in large Lithuanian service organization. As it was mentioned previously, not only there is a lack of attainments in the literature of whether BPM influences agility of large size Lithuanian service organizations, but there was also no studies of this issue found in any other country as well. However, the growing interest in organizational agility also stimulates the interest on enabling instruments. BPM is put forward as a possible tool that can help to thrive in turbulent times. By using appropriate data collection instruments, relevant information is going to be obtained and analysed in order to fill the gap of knowledge.

The problem of research is homogenous and trying to find the influencing factors, therefore, **positivism** is the most appropriate philosophy to be used. According to Bryman and Bell positivism acknowledges that natural sciences can be imitated to the study of social reality (2007). Facts here are more important than sensation, reflection or intuition. In positivism it is important to assure that facts are obtained value free, independent of social actors and objective.

The research is carried out in a **deductive sequence**. According to Ghauri and Gronhaug, deductive approach is based on logic while inductive one – on empirical evidence (2005). If the latter type starts with observation, then goes to findings and ends with theory building, in the former one the

researcher uses existing knowledge taken from literature to deduce hypotheses and test them. Based on this process, the sequence of research is built as shown in Figure 4.

**Figure 4. Research sequence with intended results**



Many reviewed researches (e.g. Balzarova et al. 2004; Baramichai et al. 2007; Holsapple and Li 2008) on BPM and organizational agility themes used case study design to run a qualitative research. The vast majority of them were trying to explore the reasons and causes of already known effects in practice instead of looking for and describing the relationship between possible variables. On the other hand, Malhora suggests that quantitative research fits better when causal dependencies between social phenomena are needed. Author distinguishes two type of quantitative research: (1) descriptive, which establishes associations between variables and (2) causal, which determines causality and effect relationships (2007). Quantitative descriptive examination on IT capability impacts on agility (Lu and Ramamurthy, 2011) was the most close to the aim of this thesis and so suggested a body of quantitative research strategy. Due to these reasons the following research is **quantitative descriptive** one and represents an empirical investigation of BPM components impact on organizational agility.

Even though experimental design would be a good choice while testing how independent variables can cause changes in dependent ones, this type of design is difficult to achieve in a real world context. The main reason is complicated control of variables. Moreover, experiments require a lot of time which is not able in particular case. Considering the fact that the problem of this thesis is a doubt whether maturity of entrepreneurial, business process and implementation level activities of BPM have positive influence on organizational agility, a **non-experimental correlation research** designed as a **survey** was chosen. Based on Johnson, there are two questions that answered positively can support a choice of descriptive non-experimental research: (1) were the phenomenon described primarily? And (2) were the characteristics of the phenomenon documented? (2001). In case of this thesis both answers are “yes”, therefore the choice of research is correct.

Summarising the justification of research strategy, design and sequence it can be said that quantitative non-experimental correlation research based on positivism philosophy and deduction approach is the most appropriate choice for the aim, raised with this thesis as it assures objectivism as

well as enables impartial insights on what impact BPM can have on agility in large size service organizations in Lithuania.

### *3.2. Data Gathering Tool*

While assessing such phenomena as business process management or agility, it is difficult to reach unconditional objectivity and this delivers one of the main limitations of thesis. Normally, conceptual models for theoretical discussions are provided in such situations which then put constraints in reusability for field researches. The subjectivity can be reduced while using evaluation in Likert scale, because it lets to compare results and does not leave space for interpretation on questions.

**Questionnaire** has been used as the main tool for data collection in this research as it is appropriate tool for deductive approach enabling anonymous and objective data gathering from primary source. The questionnaire was build on-line and situated in the ISM survey system (<http://survey.ism.lt>). This form of data gathering enabled to keep prearranged order of formal questionnaire. The shortage of on-line survey is uncontrolled interpretation of questions. There is a possibility that respondents understood questions differently. In order to minimize this risk, a questionnaire was first tested on people working with business process management and then adjusted according to given comments.

With the aim to determine maturity of BPM components and organizational agility (named in Table 1, p. 30), the questionnaire was build from three main parts: (1) control questions, (2) group of business process management situation identifying questions (questions divided in three parts according to identified BPM components) and (3) evaluation of agility in researched organizations. All questions were structured: control questions were dichotomous and hypothesis testing questions were scale ones (1–7 scale). This type of scaling was chosen as a suggestion of Kumar (2005) to use 7-point Likert scale in such researches where objectivism is difficult to achieve.

The research focus on phenomena in organizations that already practice business process based management. Therefore, three important conditions here are that (1) companies employed at least 250 people, (2) respondent was an employee of a company that at least have some experience with BPM and (3) respondent had knowledge of business processes and management situation in a company. Therefore, three control questions were incorporated in order to avoid the risk that respondents were selected inappropriate.

Questions identifying the maturity of BPM components were formed based on reviewed literature on business process management (Harmon, 2007; Harmon and Wolf, 2012; Balzarova et al.,

2004; Burlton, 2001) while questions testing organizational agility level were adjusted from the survey of Lu and Ramamurthy (2011). The relationship between questions and hypothesis (listed in p. 31) is shown in the following Table 2.

**Table 2. Questionnaire construct and supporting literature**

No	Question / Sub-question	Indicated construct	Tested hypothesis
<b>Q1</b>	<b>Please, evaluate on a 1 to 7 scale (1 = not at all true; 7 = very true) how well the statement fits enterprise level business process management in your organization</b>		
<b>S1</b>	Business processes are documented and kept up to date	BPM enterprise level maturity	H1, H2
<b>S2</b>	Units that perform similar activities use standard or similar processes		
<b>S3</b>	Business process models are defined for the major value chains		
<b>S4</b>	Performance measures are defined for evaluating the success of all major processes and sub-processes		
<b>S5</b>	Terminology and principles of process management are standardized		
<b>S6</b>	All level (processes, sub-processes, procedures, instructions) business processes are covered and linked together		
<b>S7</b>	Skills needed to perform the tasks in the major processes are defined and documented		
<b>S8</b>	Every business process have business process manager		
<b>S9</b>	There is a dedicated group or center of excellence responsible for holistic business process coordination in organization		
<b>S10</b>	Business process managers use performance data to manage their processes		
<b>S11</b>	Business process improvement programs are set in place to identify and improve problems and defects		
<b>S12</b>	Business process improvement programs are set in order to innovate services		
<b>Q2</b>	<b>Please, evaluate on a 1 to 7 scale (1 = not at all true; 7 = very true) how well the statement fits business process development in your organization</b>		
<b>S1</b>	Major business process redesign projects are undertaken in order to implement changes in organization strategy	BPM business process level maturity	H3, H4
<b>S2</b>	Business process improvement projects (small) are undertaken in order to develop services and products		
<b>S3</b>	Business process improvement are based on strategic goals of organization		
<b>S4</b>	Business process changes starts with analysis (as-is situation, root causes)		
<b>S5</b>	Infrastructure and tools capabilities are identified before started implementation of changes		
<b>S6</b>	Training capabilities are identified before started implementation of changes		
<b>S7</b>	Results of business process change monitored and evaluated		
<b>Q3</b>	<b>Please, evaluate on a 1 to 7 scale (1 = not at all true; 7 = very true) how well the statement fits business process implementation in your organization</b>		
<b>S1</b>	Business process automation projects are on a great concern	BPM implementation level maturity	H5, H6
<b>S2</b>	Enterprise management systems are integrated with business processes		
<b>S3</b>	Business process activities are monitored automatically		
<b>S4</b>	Business process modeling tools are open for all business process managers		
<b>S5</b>	Business process managers model business processes using business process management notations (e.g. BPMN 2.0)		
<b>S6</b>	Employees are trained to work upon changed processes		
<b>S7</b>	Business process managers are trained to analyze business processes		
<b>S8</b>	Business process managers are trained to design business processes		
<b>S9</b>	Business process managers are trained to coordinate and develop business processes		
<b>S10</b>	Business process managers are trained business process improvement techniques (e.g. Lean, Six-Sigma, other methodologies)		
<b>Q4</b>	<b>Relative to your competitors, please indicate on a 1 to 7 scale (1 = not at all true; 7 = very true) how well your organization performs or is positioned to perform the following activities:</b>		
<b>S1</b>	We are quick to make and implement appropriate decisions in the face of	Opportuni-	H1, H3,

	market/customer-changes	ties' Sensing Capabilities	H5
<b>S2</b>	We constantly look for ways to reinvent/reengineer our organization to better serve our market place		
<b>S3</b>	We treat market-related changes and apparent chaos as opportunities to capitalize quickly		
<b>S4</b>	We fulfill demands for rapid-response, special requests of our customers whenever such demands arise; our customers have confidence in our ability	Opportunities' Seizing Capability	H2, H4, H6
<b>S5</b>	We can quickly scale up or scale down our production/service levels to support fluctuations in demand from the market		
<b>S6</b>	Whenever there is a disruption in supply from our suppliers we can quickly make necessary alternative arrangements and internal adjustments		

As it can be seen from question table, study variables are operationalized using multi-item reflective measures on a seven-point scale. Reflective indicators are determined by latent constructs that are interchangeable, co-vary and share a common theme. Table 3 represents that maturity of BPM enterprise level is measured by 12 items, business process level – by seven, implementation level – by 10, Opportunities' sensing and seizing – each by three items, which reflect features of components, described in Table 1 (p. 30). The original questionnaire given to participants in the survey is given in the Appendix 1.

### 3.3. *Research Population and Sample Size*

The research is oriented on large size Lithuanian service organizations. As defined by the “Republic of Lithuania Law on Small and Medium-Sized Business”, *large* organization is treated as having more than 250 employees (“Small and Medium-sized”, 2013). By saying *Lithuanian* in this research author means acting in Lithuanian market, but not necessarily built from Lithuanian capital. Lastly, the term *service* is understood as selling services directly to consumer or other business. Companies which main activity is manufacturing or retail are out of the scope of this research. Concentration on large size services was based on assumption that large size companies tend to be more rigid than small ones though they should be more interested in becoming agile and stay competitive. What is more, business process management, with all three it's levels (enterprise, business process and implementation) is better suited for big enterprises as they have more resources for this type of management practice. Budgetary institutions were not included in the population as they are less interested on agile management and are less concentrated in competition than public companies.

Based on Lithuanian Department of Statistics, at the beginning of the year 2013 there were 318 large size enterprises with 250 and more employees in the country. About one third of them (104) were providing services in following areas: (1) H – transportation and storage, (2) I – accommodation and food service activities, (3) J – information and communication, (4) K – financial and insurance

activities, (5) L – real estate activities, (6) M – professional, scientific and technical activities, (7) N – administrative and support service activities, (8) P – education, (9) Q – human health and social work activities, (10) R – arts, entertainment and recreation. Here letters H, I, J, K, L, M, N, P, Q and R identifies the coding letter of economic activity by EUROSTAT Statistical classification of economic activities in the European Community (NACE Rev. 2). Table 3 provides information about the distribution of service companies according to the number of employees. The table also indicates the **population** of the research which is 104.

**Table 3. Number of enterprises in operation at the beginning of the year 2013 by size class of enterprises and economic activity (NACE 2)**

Economic activity (NACE 2)	Small and medium size enterprises: (0–249] employees							Large size enterprises: [250; ∞) employees				
	(0;4]	[5;9]	[10;19]	[20; 49]	[50; 99]	[100; 149]	[150; 249]	(0;249]	[250; 499]	[500; 999]	[1000; ∞)	[250; ∞)
<b>TOTAL All NACE 2 branches</b>	36871	14165	7479	4562	1575	493	318	<b>65463</b>	210	76	32	<b>318</b>
<b>TOTAL service NACE 2 branches</b>	17224	6080	2989	1617	461	140	89	<b>28600</b>	66	24	14	<b>104</b>

*Source:* Database of Indicators (2013)

Even though the number of population is known, the list of it is not available publically. This constrains the ability to pick a representative sample. Nonetheless a chosen technique does not permit an objective evaluation of the adequacy of the sample; Churchill and Iacobucci claim that it still can yield good estimates of a population characteristic (2009).

Needed sample size was calculated by the following formula by Schwarz (in Rudzkienė, 2005):

$$n = \frac{N \times Z^2 \times p \times q}{\varepsilon^2 \times (N - 1) + Z^2 \times p \times q}$$

Where:

$n$  – sample size

$Z$  – standard normal distribution of  $\alpha$  with 95% validity is 1,96.

$p$  –percentage picking a choice, expressed as decimal ( $p=0,5$ )

$q$  – probability that the symptom will not occur in the target population ( $q=1-p=0,5$ );

$\varepsilon$  – maximum allowed error rate which in this example is 0,05.

$$n = \frac{104 \times 1,96^2 \times 0,5 \times 0,5}{0,05^2 \times (104 - 1) + 1,96^2 \times 0,5 \times 0,5} = 82$$

According to Schwarze formula, a minimum required **sample size** should be 82 respondents. With this amount of responses results of the research should represent the population with 5% of error rate.

In order to increase representativeness, **non-probability judgmental sampling** was chosen. The important issue of the research was to have only one respondent of each company that is appropriate for the research. Moreover, participants needed to be familiar with business process management. Therefore a questionnaire was distributed by sending invitations to participate in a survey by personal e-mail. In order to select respondents, a list of potential companies was made using results of annual survey on 500 biggest Lithuanian companies run by newspaper “Verslo žinios” (2012). Then the selected companies were checked in the contact management centre on-line ([www.118.lt](http://www.118.lt)) in order to find out if the number of employees and economic activity fitted the requirements.

After a list of 104 companies was composed, a contact list was build. Some of respondents were reached through personal relationships while others were gathered by contacting selected firms by general contacts and asking for collaboration. The author of the research explained all needed information related to the research and questionnaire aiming to support companies with the background of survey. About 1/4 of connected companies did not respond to the request for collaboration or stated that they are not allowed to participate in the surveys by head office.

### 3.4. *Analysis Methods*

Quantitative research allows using statistical methods for analysis. **Multiple regressions** were chosen as it allows assessment of interrelationships among multiple dependent variables and multiple independent variables. In short, this is a general statistic technique used to analyse the relationship between a single dependent variable and several independent variables. The particular technique aims to use predictors with known values to predict the single dependent value selected by the researcher (Hair et al., 2009).

According to Hair et al. (1998) an alternative for multiple regressions could be a canonical correlation method which allows assessment of interrelationships among sets of multiple dependent variables and multiple independent variables. However, the author also ads that it is the most generalized and flexible statistical tool with wide range of interpretation which is not desirable in this thesis. Moreover, canonical correlation would create a composite measure of both dependent variables

instead of computing a separate regression equation for each of them and so constrain ability to analyze how predictors impact organizational agility components separately. Considering all the arguments listed below, two multiple regressions were considered to be the best choice for empirical test of the problem.

### 3.5. *Credibility of the Research*

**Reliability.** Evaluating the reliability of the research the risk to gather different data each time the observation would be repeated does exist. In order to minimize it, some protection methods, like test of the questionnaire intelligibility and researchers reliability. As it was mentioned, only those respondents that have experience with business processes management and knowledge in business performance (this supports the assumption that the terminology was clearly understood) were selected for the research. However, even the same respondents could give different answers if asked to fill the survey few months later. The reasons of such situation are volatile changing market situation, possible vicissitude of top managers, mergers and acquisitions of companies that can make influence on changes in strategy and so cause different evaluation of components of BPM and agility.

**Validity.** The design of the research was built in a manner that ensures consistency of the research and provides all needed data to test the Hypotheses raised. Even though this strengthens the validity of the research, the fact that there were no other similar studies held in the past and the particular research is conducted only in a quantitative nature, brings some doubts of whether the results are fully valid.

**Generalization.** Notwithstanding the fact that multiple regressions are one of the best tools for generalization, the research only provides results for specific population – large size Lithuanian service organizations. This implies that the results can be generalized neither to manufacturing or retail companies, nor to the small or mid-size service companies in the country.

The following chapter have given the background for empirical research that seeks to find out what impact BPM has on agility in large size Lithuanian service organizations. It was justified why quantitative non-experimental correlation research based on positivism philosophy and deduction approach is the most appropriate choice. Moreover, the sampling technique was described and the questionnaire of the survey was related to the hypothesis. The chapter also motivated the selection of statistical analysis technique which is about to be detailed in the forthcoming chapter.



#### 4. Empirical Research Proceedings and Findings

Previous chapter of thesis have described and motivated the methodology chosen for the research. The upcoming part of thesis discusses results that were captured by empirical test. Statistical multiple regression analysis will provide empirical measures of BPM components' impact on agility in large size Lithuanian service organizations.

Empirical results will be presented in the following sequence:

- Descriptive statistics – general overview of variables
- Assumption testing for linearity, normality, homoscedasticity and multicollinearity
- Testing the impact of Business Process Management components on Opportunities' Sensing Capability
- Testing the impact of Business Process Management components on Opportunities' Seizing Capability

As it was mentioned in Justification of Methodological Approach (p. 35), implicit variables are used in order to receive the values of independent and dependent variables. Cronbach's alpha was computed in order to estimate the reliability of scales for different sets of questions: BPM enterprise level, BPM business process level, BPM implementation level, Opportunities' sensing capability, Opportunities' seizing capability. The results received were respectively: 0.918, 0.817, 0.919, 0.867, and 0.768. All five values satisfy the minimum of at least 0.7 that is required in order the scale to be reliable.

##### *4.1. General Overview of Variables*

Just like described in chapter 3.3. (p. 37–39), the questionnaire was spread to 104 respondents and the 82 of them were expected to answer in order to form a sample with 5% of error rate. However, only full 68 answers were gathered (response rate – 65%) which a little bit lowers the confidence interval up to 7%.

For the analysis three independent metric variables ( $X_1$ – $X_3$ ) and two dependent metric variables ( $Y_1$ – $Y_2$ ) were observed ranking on 7-point scale (1 = not at all true; 7 = very true) and used as input data:

- $X_1$  = BPM enterprise level maturity,
- $X_2$  = BPM business process level maturity,
- $X_3$  = BPM implementation level maturity,

- $Y_1$  = Opportunities' sensing capability,
- $Y_2$  = Opportunities' seizing capability.

Multiple regressions analysis was run twice in order to identify which of the independent variables has influence on each of dependent ones. Therefore, the first analysis delivers relationship results for components of BPM and opportunity sensing capability, while the second one draws the dependencies between maturities of the same BPM components and opportunity seizing capability.

The objectives for the first multiple regression analysis, testing the relationship between three BPM components and opportunity sensing capability were set as follows:

- To predict opportunities' sensing capability in large size Lithuanian service organizations on the basis of predicted independent variables  $X_1$ – $X_3$ ;
- To assess the role of each independent variable.

The objectives for the second multiple regression analysis, testing the relationship between three BPM components and opportunity seizing capability were set as follows:

- To predict opportunities' seizing capability in large size Lithuanian service organizations on the basis of predicted independent variables  $X_1$ – $X_3$ ;
- To assess the role of each independent variable.

Before starting assumption testing and multiple regression analysis, a glance on descriptive statistics was made. As can be seen from the results given in Table 4, the overall level of business process component usage is about the middle and the mean only slightly differs among maturity of enterprise, business process and implementation level attributes (4.43, 4.78, and 4.18).

**Table 4. Disruptive statistics**

	N	Min	Max	Mean		Std. Devia- tion	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
<b>BPM enterprise level maturity</b>	68	2	7	4,43	,145	1,196	-,072	,291	-,597	,574
<b>BPM business process level maturity</b>	68	4	7	4,78	,115	,946	,649	,291	-,650	,574
<b>BPM implementation level maturity</b>	68	2	7	4,18	,155	1,276	-,011	,291	-,901	,574
<b>Opportunities' sensing capability</b>	68	2	7	5,05	,148	1,219	-,602	,291	-,087	,574
<b>Opportunities' seizing capability</b>	68	3	7	5,03	,142	1,169	-,078	,291	-,827	,574

These deliverables indicate that large size service companies in Lithuania think they are most advanced in managing separate business processes and tend to organize business process management in enterprise level, even though it is not much different from implementation level activities

advancement as well. If mean results of BPM components were ranked under assumption of Capability Maturity Model (described in p. 17) it could be said, that large size Lithuanian service companies are somewhere in the middle, around third level out of five which shows that situation is very similar to a world-wide practice (Harmon and Wolf, 2012).

When talking about dependent variables of this research, it can be seen that they characterize with even higher similarity as opportunity sensing capability mean is 5.05 and opportunities' seizing one – 5.03. This tells us that large size companies in Lithuania have similar capabilities in both sensing and seizing the opportunities. As the mean of dependent variables is a bit higher than the mean of independent ones, there can be an assumption made, that either the impact of business process management activities has a positive effect on dependent variables or there might be other independent variables that correlate with organizational agility which were not included into research.

Skewness and Kurtosis coefficients (Table 4, p. 42) alarm that there might be no normal distribution in any analysed variables. Almost all–BPM enterprise level maturity, BPM implementation level maturity, Opportunities' sensing and Opportunities' seizing capabilities–are shift to the left, and BPM business process level maturity–to the right. Kurtosis coefficient is far away from optimal point which indicates that gathered data is much concentrated around central point.

#### *4.2. Appropriateness of Gathered Data to Multiple Regression Analysis*

Reminding what was stated before, both dependent and independent variables are metric. The size of the sample has a direct impact on the statistical power and appropriateness of multiple regressions. Even though the recommendation of minimum sample size was 82 respondents, the researcher managed to receive a slightly lower rate of answers 68. However, for multiple regressions analysis it is enough as the three independent variables resulted in a 22:1 ration of observations to variables which are more than the guideline of 10:1 ratio and the required minimum of 5:1 ratio. The sample of 68 should not affect the estimates of sampling error markedly and therefore should not have an impact on the statistical significance of the results.

In order to make sure that the data is accurate for multiple regression test, four assumptions were tested: (1) Linearity, (2) Normality, (3) Homoscedaticity, (4) Multicollinearity. Each of them are about to be described in more detail.

**Linearity.** Multiple regression analysis has an obligatory condition that the correlation coefficient between any two variables is based on linear relationship. A bi-variate analysis was run on SPSS with gathered data (Hair et al., 2009). The results of linearity test are listed in Table 5.

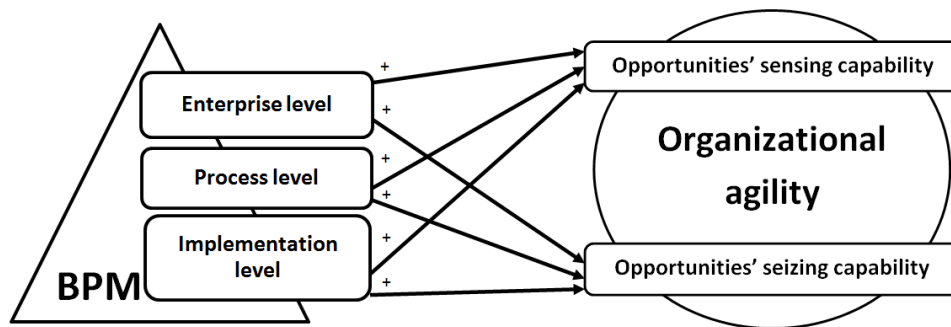
**Table 5. Bi-variate correlation (linearity test)**

		Opportunities' sensing capability	Opportunities' seizing capability
<b>BPM enterprise level maturity</b>	Pearson Correlation	.769**	.641**
	Sig. (2-tailed)	.000	.000
	N	68	68
<b>BPM business process level maturity</b>	Pearson Correlation	.559**	.541**
	Sig. (2-tailed)	.000	.000
	N	68	68
<b>BPM implementation level maturity</b>	Pearson Correlation	.718**	.615**
	Sig. (2-tailed)	.000	.000
	N	68	68

According to the Pearson Correlation, there is a significant positive relationship among all independent and dependent variables at the 0.01 level. These results suggest that the higher progress in each of the BPM level affects in both better capabilities to sense and seize the opportunities.

Figure 5 demonstrate the trend of relationship between dependent and independent variables. It can be clearly seen that all six hypotheses (H1, H2, H3, H4, H5, and H6) should not be rejected as there is a positive relationship among all components of business process management and organizational agility.

**Figure 5. Direction of the relationship between predictors and outcome variables**



Despite the fact that linearity test results show positive relationship between three components of BPM and two components of organizational agility, linearity test does not prove if the positive relationship is significant. This issue was tested with multiple regression analysis and will be described later.

**Normality.** For multiple regression analysis it is highly recommended that all independent variables are normally distributed and transformed in case of necessity.

In order to test whether data is distributed normally, an analysis function “Explore” in SPSS was used. The results are demonstrated in Table 6.

**Table 6. Normality test**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<b>BPM enterprise level maturity</b>	.064	68	.200 <sup>*</sup>	.972	68	.123
<b>BPM business process level maturity</b>	.153	68	.000	.922	68	.000
<b>BPM implementation level maturity</b>	.084	68	.200 <sup>*</sup>	.965	68	.054
<b>Oportunities' sensing capability</b>	.136	68	.003	.955	68	.015
<b>Opportunities' seizing capability</b>	.103	68	.072	.967	68	.069

Shapiro-Wilk test have shown that BPM enterprise level, BPM implementation level, Opportunities’ sensing capability and Opportunities’ seizing capability are normally distributed when alpha is 0.01. However, p-value of BPM business process level variable was less than  $\alpha$  (0.01) and thus needed to be transformed. Logarithmic transformation (Log10) in SPSS has made p-value a bit higher (0.04), and it became appropriate enough to claim the normality of the variable.

Resuming normality test it can be said that variables should be appropriate for the multiple regression analysis as they are normally distributed. Due to the fact that one of the predictor variables was not normally distributed, it was used transformed and thus replaced the original data that was gathered for BPM business process level maturity.

**Homoscedaticity** refers to the assumption that dependent variables exhibit equal levels of variance across the range of predictor variables. Homoscedasticity implies that the relationship between two variables is constant over the full range of data and so increases the accuracy of multiple regressions. Homoscedaticity test should make it sure that dependent variables (to name opportunities’ sensing and seizing capabilities) exhibit equal levels of variance across the range of predictor variables (to name maturity of BPM enterprise, business process and implementation levels).

Homogeneity of variance was tested with one-way ANOVA test, comparing means (Levene’s test). According to the results shown in Table 7 (p. 46), opportunities’ seizing capability provide equal levels of variance across the range of independent variables (p-value  $> \alpha$ , where  $\alpha=0.01$  ), while opportunities’ sensing capability provide different variance between BPM business process level predictor and two other predictors. Thus, a test was repeated with transformed data that resulted positively.

**Table 7. Test of homogeneity of variances**

	Levene Statistic	Sig.			
	Opportunities' sensing capability	Opportunities' seizing capability	Opportunities' sensing capability	Opportunities' seizing capability	
BPM enterprise level maturity	.587	1.551	.853	.129	
BPM business process level maturity	2.759	2.044	.005	.034	
Transformed BPM business process level maturity	2.187	1.379	<b>.023</b>	.200	
BPM implementation level maturity	1.395	1.615	.193	.110	

The test of homogeneity of variances have shown that it is better to use transformed BPM business process level variable as it assures homoscedasticity and increases the accuracy of for multiple regressions. Even though in normality test transformation did not deliver significant difference, the current test has supported usage of transformed data.

**Multicollinearity.** The last assumption of multiple regressions is that two or more predictor variables are highly correlated, meaning that one can be linearly predicted from the other with a non-trivial degree of accuracy. Even though multicollinearity does not reduce the reliability or power of the model as a whole, it does affect calculations regarding individual predictors.

**Table 8. Multicollinearity test**

Dependent variables Independent variables	BPM enterprise level maturity		Transformed BPM business process level maturity		BPM implementation level maturity	
	Co-linearity Statistics		Co-linearity Statistics		Co-linearity Statistics	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
BPM enterprise level maturity			.412	2.428	.524	1.909
Transformed BPM business process level maturity	.795	1.257			.524	1.909
BPM implementation level maturity	.795	1.257	.412	2.428		

Co-linearity statistics help to find out if there is a risk of multicollinearity. As shown in Table 8, in all cases of the tested data the value of tolerance were greater than  $\alpha$  (0.01), therefore there is no multicollinearity. Additionally, VIF is also the measure of multicollinearity and indicates it if  $VIF > 10$ . As all the delivered values of VIF were less than 3, it showed no risk of multicollinearity.

To take all assumptions tests into account, it can be concluded that not all gathered data was applicable for the multiple regression analysis as it had linear relationship, was normally distributed,

homogenous and did not have the effect of multicollinearity. Therefore, results of inappropriate variable–Business process level maturity–was transformed to fit the needed criterias.

#### 4.3. *The Impact of Business Process Management Components on Opportunities' Sensing Capability*

Previous part of thesis has proved prepared data for multiple regression analysis. In order to test the impact of three business process management components (maturity of enterprise level, business process level and implementation level features) on the first outcome (opportunities' sensing capability) multivariate regression analysis was employed. Backward method was chosen so as to eliminate not significant predictors from the model.

The test on SPSS has shown that business process level maturity have no significant value on opportunities' sensing capability as this variable was rejected using backward method. A delivered R square value for other two variables was 0.631 (Table 9) This number indicates that 63% of the measured outcome of dependent variable can be accounted by the model. The adjusted R square is a bit lower and suggests that if the same model was applied to a different sample, it would result in slight loss (0.011) of predicted power.

**Table 9. Model summary of multiple regressions, when dependent variable is opportunities' sensing capability**

Predictors	R	R Square	Adjusted R Square	Std. Error of the Estimate
Enterprise level, Business process level and Implementation level maturity	.800 <sup>a</sup>	.640	.623	.749
Enterprise level, Implementation level maturity	.795 <sup>b</sup>	.631	.620	.752

The partial correlation coefficient (squared values from Table 10) shows that if other independent variables were kept constant, BPM enterprise level would have 24% of influence on the result of opportunities' sensing capability.

**Table 10. Coefficients of multiple regressions, when dependent variable is opportunities' sensing capability**

	Un-standardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		Collinearity Statistics	
	B	Std. Error	Beta			Partial	Part	Tolerance	VIF
(Constant)	1.409	.358		3.938	.000				
BPM enterprise level maturity	.540	.120	.530	4.513	.000	.488	.340	.412	2.428
BPM implementation level maturity	.298	.112	.312	2.660	.010	.313	.200	.412	2.428

With the same conditions, BPM implementation level would accordingly have 10% of impact. Under these circumstances BPM enterprise level component has the strongest power on how well companies can sense the opportunities while business process level maturity is not significant at all. This outcome denies assumptions of relationship found in analysed literature.

Going further, squared semi-partial coefficient (Table 10, p. 47) illustrated the unique contribution to the model, which is 12% for enterprise and 4% for implementation level activities. Added all together predictors result in 14% explanation of the variance. The overlap of the predictors in this model is 49% (difference between R square and sum of unique impact of predictors on criterion variable).

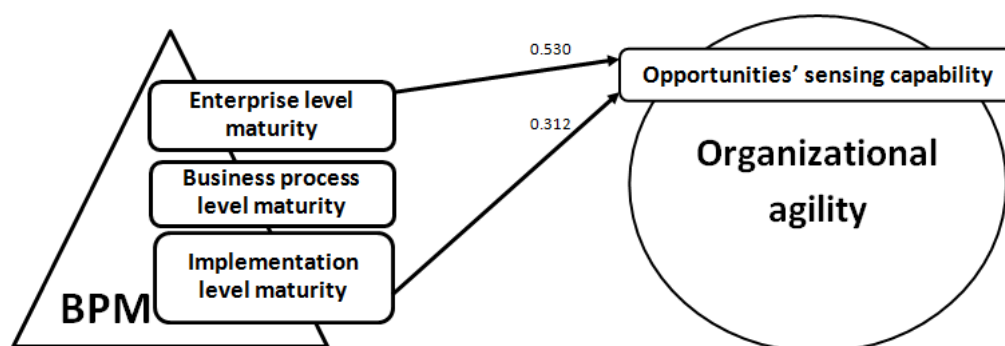
According to the co-linearity statistics none of the variables have risk of multicollinearity, because tolerance coefficient is significantly higher than 0.1 and VIF coefficient is lower than 5. Therefore it can be claimed that it is possible to tell which predictor is doing the actual predicting.

In order to be significant predictors of opportunities' sensing capability, the p-value of independent variables have to be  $< \alpha$  (0.01 / 0.05). In this case, business process predictor does not have significant impact on ability to sense opportunities (excluded from the table) while both enterprise and implementation level predictors can be treated as significant ones at level 0.05. According to the standardized coefficient  $\beta$ , shown in the Table 10, the equation of ability to sense opportunities can be expressed as follows:

Opportunity sensing capability =  $0.530 * \text{BPM enterprise level} + 0.312 * \text{BPM implementation level}$ .

The strengths of multiple regression models are illustrated in Figure 6.

**Figure 6. Multiple regression model when the outcome is opportunities' sensing capability ( $R^2 = 0.631$ )**





Based on the results of multiple regressions, a valuation of H1, H3 and H5 can be given:

- **H1 and H5 are supported**

*H1: BPM enterprise level maturity is positively associated with opportunities' sensing capability*

*H5: BPM implementation level maturity is positively associated with opportunities' sensing capability*

- **H3 is rejected**

*H3: BPM business process level maturity is positively associated with opportunities' sensing capability*

Taking all results of the first multiple regressions into account, it can be resumed that the maturity of enterprise level activities in large size Lithuanian service companies have the strongest positive impact on the result of how well organization can sense the opportunities. Implementation level maturity also characterizes in a significant influence, while business process level maturity was found not to have any significant power for better sensing of opportunities.

#### 4.4. The Impact of Business Process Management components on Opportunities' Seizing Capability

If the first analysis tested the relationship between BPM components and opportunity's sensing capability, the upcoming one concentrates on relationship of the same BPM components and opportunities' seizing capability. Just like before, a multiple regression analysis was employed. Backward method was chosen again with the purpose to eliminate not significant predictors from the model.

One of the variables—maturity of enterprise level—was excluded as it had lower significance (Table 11). Therefore, in this model only two independent variables were included. R square value in this case is lower than in first multiple regression analysis – 0.467 (Table 11). This indicates that ~47% of the criterion variable measured outcome can be accounted by the model. The adjusted R score indicates 0.016 loss of predicted power in case that the same model was applied to a different sample.

**Table 11. Model summary of multiple regressions, when dependent variable is opportunities seizing capability**

Predictors	R	R Square	Adjusted R Square	Std. Error of the Estimate
Enterprise level, Business process level, Implementation level maturity	.692 <sup>a</sup>	.479	.455	.863
Business process level, Implementation level maturity	.683 <sup>b</sup>	.467	.451	.867

Table 12 provides partial and semi-partial coefficients which squared shows the common (14%, 25%) and unique (9%, 18%) contribution of business process and implementation components of BPM to the model. The overlap of the predictors in this model is 20%.

**Table 12. Coefficients of multiple regressions, when dependent variable is opportunities seizing capability**

	Un-standardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	.112	.861		.131	.896					
BPM business process level maturity	4.5	1.417	.331	3.282	.002	.538	.377	.297	.806	1.240
BPM implementation level maturity	.431	.092	.470	4.660	.000	.615	.50	.422	.806	1.240

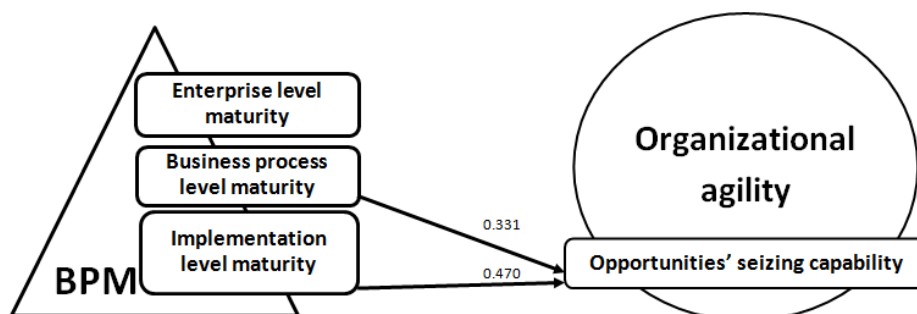
According to the co-linearity statistics there is no risk of multicollinearity, because tolerance coefficient is significantly higher than 0.1 and VIF coefficient is lower than 5. Therefore it can be claimed that it is possible to tell which predictor is doing the actual predicting.

After the BPM enterprise component was excluded from the model, the significance coefficient delivered p-values of business process and implementation level components became lower than  $\alpha$  (0.01). In this case, business process and implementation level predictors can be treated as significant ones. According to the standardized coefficient  $\beta$ , shown in the Table 12, the equation of ability to seize opportunities can be expressed as follows:

Opportunity seizing capability =  $0.331 * \text{BPM business process level} + 0.470 * \text{BPM implementation level}$ .

The strengths of multiple regression models are illustrated in Figure 7.

**Figure 7. Multiple regression models when the outcome is opportunities' seizing capability ( $R^2 = 0.467$ )**



Based on the results of multiple regressions, a valuation of H2, H4 and H6 can be given:

- **H4 and H6 are supported**

*H4: BPM business process level maturity is positively associated with opportunities seizing capability.*

*H6: BPM implementation level maturity is positively associated with opportunities seizing capability.*

- **H2 is rejected**

*H2: BPM enterprise level maturity is positively associated with opportunities seizing capability.*

Altogether, the second multiple regression analysis has indicated, that the maturity of enterprise level activities have no significant influence for the way how large size Lithuanian service organizations manage to seize the opportunities. The strongest influencer here was found maturity of implementation level activities. Business process level maturity, which was described as the most concentrated on operational level and change management, surprisingly was ascertained not that much influential.

To sum up the results of empirical analysis, it is obvious that not all the relationships, predicted by the literature were proved for large size Lithuanian service organization. Business process activities were not found important for the way how organizations find new opportunities, and the scope of enterprise level activities seems not that much influential for fluent and quick fulfilment of found opportunities. These results are about to be disputed more deeply in the upcoming discussion part.

## 5. Discussions

The whole previous part of the work have already determined the concepts of BPM and organizational agility, deducted hypotheses on how the later is influenced by the former, collected data from large size service organizations in Lithuania and analyzed that data statistically. The subsequent chapter is about to synthesize findings captured in literature review and empirical research. Firstly, the significant findings of empirical research will be overviewed and considered with the findings that were delivered by the study of other researches and literature so far. Then, results that failed to support the hypothesis will be examined. Lastly, limitations of the study and implications for further research will be discussed.

### 5.1. *Synthesis of the Literature Review and Empirically Supported Hypothesis*

The problematic issue of the research was to understand how organizational agility is influenced by BPM in large size Lithuanian service organization. With regard to this question six hypotheses were raised specifying the possible positive influence by maturity level of three BPM components to the capabilities of sensing and seizing opportunities. As it is listed in the Table 13, empirical research has shown that four of them (H1, H4, H5 and H6) are significant while other two (H2 and H3) have failed to be approved.

**Table 13. Summary of hypothesis and results**

Hypothesis	Relations	Predicted Sign	Results
H1	Direct effect: BPM enterprise level maturity → Opportunities sensing capability	+	Supported
H2	Direct effect: BPM enterprise level maturity → Opportunities seizing capability	+	Rejected
H3	Direct effect: BPM business process level maturity → Opportunities sensing capability	+	Rejected
H4	Direct effect: BPM business process level maturity → Opportunities seizing capability	+	Supported
H5	Direct effect: BPM implementation level maturity → Opportunities sensing capability	+	Supported
H6	Direct effect: BPM implementation level maturity → Opportunities seizing capability	+	Supported

The study has provided initial empirical evidence via examination of the link between BPM and organizational agility. After a literature review it was stated that maturity of BPM construction, build from enterprise, business process and implementation levels, can be treated as enablers for the capabilities of sensing and seizing opportunities which together form an agile organization. This helps to extend the role of BPM in order to understand the relationship between BPM and agility. Both theory and measurement about essential BPM components and their relationship with agility refined the conceptualization and measurement of BPM and organizational agility. These acknowledgements

are fundamental to better understand the value of process based management approach implementation which is named as a key to fast, flexible and responsive to market needs organization that has been under a great concern during the last decades (Burlton, 2001; Harmon, 2007; Fingar, 2012, Singh, 2012).

Significant findings of the empirical research provided several implications. First, maturity of enterprise level activities in business process management has the strongest positive impact on how well the organization senses new opportunities. This detection is highly supported by process guru Burlton, which states that concentration on process management from the top–enterprise level–have gained success in significant performance improvement for many organizations (2011). This finding underscores the fact that firms need to develop competency level in enterprise level dimension in order to successfully manage business processes and thus realize greater agility. Belzarova et al. also stressed the importance of this issue (2004).

Another finding from statistical analysis of gathered data have shown that skills to implement changed business process in IT and HR should be improved simultaneously as it also has a great impact on how quick organization finds efficient opportunities to satisfy the needs of customers. This declaration supports one of the main ideas from totally quality management theorists (Middleton, 2004; Chakraborty and Tan, 2012) and Lu and Ramamurthy (2011) as well. However, this finding denies doubts of Yang and Liu (2012), Harmon (2007a), and Harmon and Wolf (2012) as their stated that implementation level activities have no impact on opportunities sensing capability. The results declare that knowledge and information management just like process alignment with tools and information technologies are the key issues for hearing the voice of customers and other stakeholders.

According to these two findings it can be summarised that standardization of processes, using value chains, mapping all processes and sub-processes in the organization and developing other centralized tools (Belzarova et al., 2004; Holsapple and Li, 2008; Burlton, 2011; Harmon and Wolf, 2012) together with concentration of entire organization involvement in changes (Middleton, 2004; Chakraborty and Tan, 2012) and IT adaptation (Lu and Ramamurthy, 2011) helps organization to reach speed while meeting changing requirements and market situation.

The third implication delivered by the empirical research indicates that maturity of business process implementation level is a meaningful factor for rapid physical deal with market or demand changes. The latter capability of seizing opportunities was also found to be dependent on facilities to organize business process improvement and re-engineering projects. Both of these findings were

supported by the literature (Burlton, 2001; Lu and Ramamurthy, 2011; Yang and Liu, 2012; Harmon, 2007a; Harmon and Wolf, 2012). The named fact suggests companies, that are interested in embodiment of found opportunities, to concentrate on supporting employees with trainings, prepare tools, motivation systems and how the change project are managed.

Altogether, the every level (enterprise, business process and implementation) distinguished in the BPTrend pyramid (p. 18) is important in order to develop organizational agility. Different levels have influence on one or both components (opportunities sensing and seizing capabilities) of organizational agility that should not be separated aiming to reach competitive advantage. Therefore, holistic approach, suggested by Harmon (2007a, 2007b) and Burlton (2001) can be used as guidance for process based management approach building in the organization seeking to be agile.

## *5.2. Synthesis of the Literature Review and Empirically Rejected Hypothesis*

Continuing the discussion of findings, hypothesis that failed to support the theory also provide two important implications. Starting with the H2, it can be stated that there is no significant impact of enterprise level maturity to the speed and efficiency in seizing detected opportunities. This doubt was supported by authors, analysing organizational agility (Lu and Ramamurthy, 2011; Yang and Liu, 2012) as they didn't think there should be a direct relationship. Despite the fact that the linearity test has shown that relationship does exist and is positive, multiple regression analysis have denied this assumption. Briefly, putting all efforts on development of enterprise level competencies is not enough in order to become agile as it can only help to discover chances but not catch them. This statement conflict with ideas by Burlton (2001, 2011), Harmon (2007a) and Belzarova et al. (2004) who argued that enterprise level activities should have the highest significance both for finding new opportunities and implementing them. However, this issue is not appropriate in large size Lithuanian service organizations. Therefore, companies seeking for agility should not constrain themselves with only putting all the efforts on strategic management and enterprise level business process management.

The last finding points out the limitation of business process level maturity (H3). As stated before, running business process change projects, employing business process improvement techniques like Six-Sigma, Lean or other and assuring consistent flow of activities can help a company to deliver results quickly. However no significant impact on sensing new opportunities was found in large size Lithuanian service organizations. This lack of empirical evidence oppose both to authors, that analyzed BPM (Burlton, 2001; Harmon, 2007; Wolf, 2012) and the ones that were researching on organizational agility (Lu and Ramamurthy, 2011; Yang and Liu, 2012). All of them saw the importance of effective

process' change project management to better hearing of customer and stakeholder voice. Here again, as in the example with H2, the linear relationship was proved to be positive; however multiple regression analysis have eliminated variable indicating business process level activities as not significant. Thus, engaging with business process level activities does not improve external agility; however, it should not make any harm either as negative impact was not found as well.

Considering the fact that business process level issues can be employed independently from enterprise level activities, the delivered result of empirical research does not look awkward. It was mentioned in literature analysis, that it is not essential to have holistic management of business processes in order to make improvements in one separate process (Burlton, 2001; Harmon, 2007a). And yet, breakdown of the full picture into small silos and losing the links between them can harm the ecosystem of entire organization. Therefore, organizations should take into account that choosing to develop business process level maturity separately from other two (enterprise and implementation) levels cannot cause organizational agility and continuous competitive advantage.

Summarising issues of empirically rejected hypothesis it can be concluded that theoretical model was found not fully applicable in large size Lithuanian organizations. The statistical analysis of gathered data have denied the two assumptions: (1) enterprise level maturity can help organizations to implement opportunities in agile manner and (2) business process level activities can help to develop opportunities sensing capability. These inferences should draw attention of organizations not to use listed activities for outcomes that were rebutted.

### *5.3. Limitations of the Study*

Besides that majority of the findings contribute to the existing literature about business process management influence on organizational agility, some restrictions occur and should be taken into account before making generalization of the results. Limitations can be extended in the following areas. First of all, the sample size of 68 is relatively small (recommended sample size with 5% error rate was 82). Furthermore, sample is confined only to large size Lithuanian organizations which limit ability to generalize the results to a wider population of firms. Therefore, the study should be replicated in and extended to other contexts.

Second, process based management and organizational agility are under concern of long-term goals (Burlton, 201; Harmon, 2007a). The research that was taken enables only the analysis of one time measure, while running a research in longitudinal manner would allow analysing the changes over time.

Third, the research can be criticized on the circumstances of subjective assessment. Respondents were asked to evaluate the statements both about maturity of business process management levels and agility. A cross-sectional research design could be used separating the analysis of predictors and outcomes in order to minimize the risk of subjectivity. For example, business process managers could be questioned about business process management while CEO's could be asked to evaluate the level of agility related statements. However, the author of this research made an assumption that careful selection of respondents that are related with business process management, IT development or quality management can be treated as a protector, because these employees should be aware of common health of the organization, not only about their functions.

#### *5.4. Implications for Further Research and Organization Management*

Considering other possible researches in the future, there are some possible choices. If to continue studies of the same problem, some corrections could be made in a questionnaire making it easier to understand and using more common linguistic. Moreover, respondents could be surveyed directly, not on-line, which would allow explaining fuzzy or misleading notations. Also, as it was noticed while discussing limitations, other forms for data gathering could be employed, like cross-sectional design. One more possible extension of the research could be to evaluate the attitude of customers towards selected companies, which could help to test relationship between business process management with the way customers feel about agility of the companies.

On the other hand, the same research without any dramatic changes could be repeated in other kind of organizations differing by sizes (small, medium, large), economic activities (manufacturing, retail), geographic location (Baltic countries, Nordic countries, EU countries, non-EU countries, etc.) and so enable wider analysis and comparisons.

Lastly, future research could extend the discussed one and examine how other elements such as culture, structure of organization, hierarchy, middle-line managers or employees' education interact with BPM in enabling agility. According to Lu and Ramamurthy, it is crucial to understand the importance of capability and how it is build in order to make sound decisions about how to assess, exploit, and leverage its current capabilities or to decide how the firm can develop new capabilities (if it is worth it) with the aim to succeed (2011). Thus, a deeper analysis, examining causality of agility could deliver valuable and practically applicable results.

All in all, there is a wide range of possible extension of the research on BPM influences to organizational agility. Starting with the simplest ones, like improvement of the same techniques and



tools the problem can also be upgraded to a higher levels, like searching for similarities and differences between different populations, changing analysis tools and methods, and eventually, expanding the range of predictors.

Taking a glance on managerial implication, the findings of the research counsels few important issues. First, business process based management approach should be started to implement from the top – enterprise level activities. Only when infrastructure of processes and all alignments with IT and personnel is prepared organization can succeed in being one step further from competitors while capturing opportunities for process, service and product development. Thus it is advised to reuse BPTrend recommendation for organizing enterprise level and implementation tools. On the other hand, organizations should also take into account existing best practices and methodologies for particular process' change projects. Even though there are plenty of methodologies (e.g. Lean, Six-Sigma, Business Rules methodology, etc.) Harmon (2007) and Burlton (2001) suggest developing unique one that could fit organization and help it to gain competitive advantage. Lastly, people and IT systems should not be forgotten, as they can both – stimulate or ruin the agility of organization. Various trainings, covering working in cross-functional teams, using tools and terms, setting measurements and modelling processes should be planned consistently and every time the new change is organized. The same can be told about IT systems. Automation of processes is a great concern for cost efficiency, but it has to be made with orientation on strategic goals, reflect business processes and leave space for changing business rules.

To sum up, this research provides managers of organizations with important evidences on the sequence of business process management implementation. It helps to distinguish which level activities should be employed as the starting point and which ones should be developed in specific case – when organization needs more effectiveness in sensing or seizing opportunities.

## 6. Conclusions

The paper conducted to cognition of extremely relevant organizational agility topic and its relationship with process based management. Research proposal have described the main drivers for becoming agile: (1) rapid change of business environment, (2) growing demand and requirement of customers, (3) e-commerce challenges, and (4) natural need to be profitable. The assumption was made that the goal of agility can be reached by employing business process management (BPM). The study has risen with five objectives in order to solve the problem. All of them were covered and delivered the results listed above.

1. The first objective was to reveal the literary concept and theoretical nature of BPM. According to literary review, BPM is a holistic management approach that aligns business processes of organization with the wants and needs of stakeholders. BPM combines business process automation, control of product or service quality, change and risk management, and shields it with strategic management. The construction of this approach is best illustrated by BPTrends pyramid (p. 18) which distinguishes three main levels: (1) enterprise, (2) business process and (3) implementation one. Previous researches, monographs and surveys of practitioners have shown that BPM can be treated as a tool that enables organizations to capture with growing demands and turbulent environment. Normally, companies do not maintain all three BPM levels in the same high, therefore, even the same company can acquire different maturity level with each of BPM component, and thus each of them can be enabler for organizational agility.
2. The second objective was to reveal the literary concept and theoretical nature of organizational agility. Agility itself was found to be a complex context that is confused by various expectations of organization managers. The literature described organizational agility as ability to use internal capabilities (e.g. market knowledge) with the aim to exploit profitable opportunities in a flux marketplace. According to the theory analysis, organizational agility consists of two capabilities: opportunities' sensing and opportunities' seizing. Both of them need to be fulfilled to become agile. Moreover, the factors that empower organizational agility have been found similar to the ones that were named in different levels of BPM.
3. The third objective was to suggest a conceptual model of relationship between independent variables of BPM and dependent variables of organizational agility. Theory suggested that

there should be a positive relationship between components of BPM and organizational agility. The assumption was formulated, that companies, practicing BPM, should succeed in becoming agile. Specifically, maturity of BPM components (enterprise level, business process level and implementation level) was chosen as predictors to distinguished components of organizational agility (capabilities to sense and seize opportunities). The aim of a study was to explore what impact BPM has on agility in large size Lithuanian service organizations. Six hypotheses were formulated in order to test each of the possible relationship. A sample of 68 companies out of 104 was surveyed in order to solve the problem and understand how BPM influences organizational agility.

4. The forth objective was to measure empirically what impact BPM has on agility in large size Lithuanian service organizations. Methodological approach specified best tools for measuring relationship between predictors and criterion variables. Multiple regressions were chosen as a statistical analysis tool in order to test the significant relationships between components of BPM and organizational agility. Data was gathered using on-line survey, which was filled by personally invited employees of selected large size Lithuanian service companies. Empirical measurement has shown that not all of relationships are significant. In particular, it was found that BPM enterprise level maturity has no direct positive impact on how well organizations take advantage of identified opportunities. Moreover, business process level maturity appeared to be not influential to the way how organizations capture opportunities. On the other hand, enterprise level appeared to be the most important factor for the latter capability. Combined together with implementation level activities and tools, these BPM components can result in greater market capitalizing agility. As well as implementation level activities in conjunction with business process ones can make a note in operational adjustment agility. To put it briefly, applied in full scope of all enterprise, business process and implementation levels, BPM can result in both capabilities to sense and seize opportunities.
5. The last (fifth) objective was to formulate the recommendations of what BPM components can be used to reach organizational agility. The most important recommendation for problem solution is that large size Lithuanian service companies should develop enterprise level business process management mechanism and pay important attention to the way business process changes are implemented if they want to be fast and felicitous in detecting

new ways for product and service development. Nevertheless, companies should assure the smooth implementation procedure, organization of operational processes, IT improvements as well as prepare employees for changes and valuable participation in business process development projects. Firms need to continuously nurture and develop process thinking together with cross-functional contribution in order to successfully manage and leverage their business processes and thus build agile organizations.

The following research has approved the relationship between two concepts that previously were not studied empirically. Yet, the research population was very narrow and can form solutions only for large size Lithuanian service organizations. Even though, this study have opened up further discussion and invites to generate a more holistic, comprehensive understanding about the contradictions and dynamics of BPM and agility.

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## List of Appendices

### Appendix 1.

#### Original questionnaire.

Veiklos procesų įtaka vadybos sistemos lankstumui stambiose Lietuvos paslaugų organizacijose

Gerbiamas respondente,

Esu ISM Vadybos ir ekonomikos universiteto studentė Gintarė Latvytė, besidominti Veiklos procesų valdymo praktikomis ir jų nešama nauda. Teorinėje bei praktinėje literatūroje dažnai teigiama, kad Veiklos procesų valdymas yra viena iš priemonių, padedančių organizacijoms pasiekti lankstumo vadyboje, greičiau reaguoti į kintančius rinkos bei klientų poreikius, taip pat, greitai ir be pasipriešinimo įdiegti pokyčius praktikoje. Mano magistrinio darbo tikslas išsiaiškinti, kiek ši „taisyklė“ tinka stambioms Lietuvos paslaugų (įskaitant finansinę veiklą) organizacijoms. Originalus darbo pavadinimas anglų kalba: *The Impact of Business Process Management on Agility in Large Size Lithuanian Service Organizations*.

Maloniai prašau sudalyvauti apklausoje ir atsakyti į pateiktus klausimus taip, kad atsakymai atspindėtų esamą situaciją Jūsų atstovaujamoje įmonėje.

Pastaba: Anketoje angliškas terminas „Business process“ yra verčiamas kaip „Veiklos procesas“.

Šioje apklausoje yra 6 klausimai.

#### 1. Bendrieji klausimai

- 1.1. Prašau nurodykite, kiek apytiksliai darbuotojų dirba Jūsų atstovaujamoje įmonėje (Jei įmonė tarptautinė, nurodykite tik Lietuvoje dirbančiųjų skaičių)\*

Pasirinkite **tik vieną** iš pateiktų variantų:

- ☐ Mažiau nei 250  
☐ 250 arba daugiau

- 1.2. Prašau, nurodykite, ar pateikti teiginiai Jūsų atveju yra teisingi \*

Parinkite po vieną atsakymą **kiekvienam** teiginiui:

	Tiesa	Netiesa
Mano atstovaujama įmonė turi bent šiek tiek tokios veiklos procesų valdymo praktikos	<input type="radio"/>	<input type="radio"/>
Mano darbo pareigos susijusios su veiklos procesų, veiklos kokybės valdymu arba IT vystymu.	<input type="radio"/>	<input type="radio"/>

## 2. Klausimai apie veiklos procesų valdymą (Business Process Management)

2.1. Prašau, įvertinkite skalėje nuo 1 iki 7, kaip toliau pateikti teiginiai apie strateginį veiklos procesų valdymą tinka Jūsų atstovaujamai organizacijai \*

Parinkite po vieną atsakymą **kiekvienam** teiginiui:

	1 - visiškai netinka	2	3	4	5	6	7 - visiškai tinka
Veiklos procesai yra aprašyti ir nuolatos atnaujinami	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Padaliniai / skyriai, kurie atlieka panašias veiklas naudoja vienodus / panašius procesus, vidines tvarkas (t.y. nėra kiekvienam skyriui sukurtas individualaus proceso)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesai yra aprašyti pagrindinėse veiklos srityse iš kuriamos vertės perspektyvos (ang. value chain)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos rezultatai yra matuojami taip, kad būtų galima įvertinti visų svarbiausių procesų sėkmę	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų principai ir savokos yra standartizuoti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visų lygių veiklos procesai (t.y. procesai, subprocesai, procedūros, instrukcijos) yra identifikuoti ir susieti tarpusavyje	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Svarbiausių procesų užduotims atlikti reikalingi įgudžiai yra apibrėžti ir aprašyti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kiekvienos veiklos procesas turi veiklos proceso vadovą	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Už visapusišką veiklos procesų koordinavimą ir organizavimą yra atsakinga speciali grupė ar kompetencijų centras (ang. Centre of Excellence)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų vadovai naudoja veiklos duomenų	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - visiškai netinka	2	3	4	5	6	7 - visiškai tinka
statistiką, kad valdytų savo procesus							
Veiklos procesų tobulinimo programos yra inicijuojamos siekiant nustatyti ir išspręsti problemas bei defektus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų tobulinimo programos yra inicijuojamos siekiant iš esmės tobulinti (ang. innovate) paslaugas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.2. Prašau, įvertinkite skalėje nuo 1 iki 7 kaip toliau pateikti teiginiai apie veiklos procesų vystymą tinka Jūsų atstovaujamai organizacijai \*

Parinkite po vieną atsakymą **kiekvienam** teiginiui:

	1 - visiškai netinka	2	3	4	5	6	7 - visiškai tinka
Stambiausi veiklų procesų pertvarkymai (ang. redesign) yra atliekami siekiant įdiegti pokyčius organizacijos strategijoje, ją keisti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smulkūs veiklos procesų tobulinimo projektai yra atliekami siekiant patobulinti paslaugas ar produktus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smulkus veiklos procesų vystymas yra tiesiogiai susijęs su esamais strateginiais organizacijos tikslais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų pokyčiai pradedami nuo analizės (pvz., esamo proceso analizė, šakninių nesėkmės priežasčių nustatymu ir pan.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Įrankiai, reikalingi veiklos procese ir jų tarpusavio sąveikos bei taisytinos vietos yra nustatomi dar prieš pradedant pokyčių diegimą	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dar prieš pradedant pokyčių diegimą, išsiaiškinama,	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - visiškai netinka	2	3	4	5	6	7 - visiškai tinka
kokias proceso dalyvių kompetencijas reikės kelti							
Veiklos procesų pokyčių rezultatai yra stebimi ir vertinami	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.3. Prašau, įvertinkite skalėje nuo 1 iki 7 kaip toliau pateikti teiginiai apie veiklos procesų pokyčių diegimą tinka Jūsų atstovaujamai organizacijai \*

Parinkite po vieną atsakymą **kiekvienam** teiginiui:

	1 - visiškai netinka	2	3	4	5	6	7 - visiškai tinka
Veiklos procesų automatizavimo projektai yra viena iš prioritetinių įmonės kryptių	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Verslo valdymo sistemos yra paremtos veiklos procesais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų veiklos yra automatiškai stebimos ir kontroliuojamos (ang. monitored)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų modeliavimo įrankiai yra laisvai prieinami visiems veiklos procesų vadovams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų vadovai modeliuoja veiklos procesus naudodami vieningą žymėjimo sistemą (pvz., BPMN 2.0)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keičiantis procesams, darbuotojai yra mokomi, kaip su jais dirbti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų vadovai yra mokomi analizuoti veiklos procesus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų vadovai yra mokomi modeliuoti procesus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiklos procesų vadovai yra mokomi koordinuoti ir	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 - visiškai netinka	2	3	4	5	6	7 - visiškai tinka
vystyti procesus							
Veiklos procesų vadovai yra mokomi veiklos procesų vystymo technikų (pvz., Lean, Six-Sigma, kitos metodologijos)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 3. Klausimai apie vadybos lankstumą

3.1. Prašau, įvertinkite skalėje nuo 1 iki 7 kaip gerai Jūsų organizacijai sekasi atlikti ar kaip ji yra pasiruošusi atlikti žemiau išvardintus veiksmus, lyginant su Jūsų įmonės konkurentais \*

Parinkite po vieną atsakymą **kiekvienam** teiginiui:

	1 - visiškai netinka	2	3	4	5	6	7 - visiškai tinka
Mes greitai priimame reikiamus sprendimus, kai to reikalauja klientai ar kintanti situacija rinkoje	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mes nuosekliai ieškome būdų kaip pakeisti ar performuoti savo organizaciją, kad galėtume geriau atitikti rinkos poreikius	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Su rinka susijusius pokyčius ir susidarantį chaosą priimame kaip galimybę greitai įvesti teigiamus pokyčius	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mūsų klientai pasitiki mūsų sugebėjimais, nes mes greitai reaguojame į specialius ar netikėtus jų poreikius	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mes galime padidinti arba sumažinti savo teikiamų paslaugų pasiūlą, kad atitiktumėm kintančios rinkos poreikius	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jei mūsų partneriai ar tiekėjai turi sutrikimų, mes greitai randame tinkamą alternatyvą, kad išlaikytume savo teikiamų paslaugų kokybę	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Maloniai dėkoju už skirtą laiką. Esu tikra, kad su Jūsų pagalba paaiškės, kokių rezultatų Veiklos procesų valdymo praktika jau yra atnešusi Lietuvos įmonėms. Tai gali tapti paskatinimu stiprinti procesinio valdymo populiarumą Lietuvoje ir atnešti naudos visiems: įmonėms, klientams, darbuotojams bei valstybei.

Jei norėtumėte sužinoti, kokie bus apklausos rezultatai, prašau, parašykite man į e-paštą: [latvgint@stud.ism.lt](mailto:latvgint@stud.ism.lt)

Mielai pasidalinsiu su Jumis savo įžvalgomis

Dėkoju,

Gintarė Latvytė