

# Six Sigma Assessment in the Latvian Commercial Banking Sector

J. Erina, I. Erins

**Abstract**—The goals of the present research are to estimate Six Sigma implementation in Latvian commercial banks and to identify the perceived benefits of its implementation.

To achieve the goals, the authors used sequential explanatory method.

To obtain empirical data, the authors have developed the questionnaire and adapted it for the employees of Latvian commercial banks. The questions are related to Six Sigma implementation and its perceived benefits. The questionnaire mainly consists of closed questions, the evaluation of which is based on 5 point Likert scale.

The obtained empirical data has shown that of the two hypotheses put forward in the present research – Hypothesis 1 – has to be rejected, while Hypothesis 2 has been partially confirmed.

The authors have also faced some research limitations related to the fact that the participants in the questionnaire belong to different rank of the organization hierarchy.

**Keywords**—Six Sigma, Quality, Commercial banking sector, Latvia.

## I. INTRODUCTION

RECENTLY, Six Sigma system has gained popularity as an efficient tool used to most comprehensively assess the quality of bank products and services, as well as the level of customer satisfaction. The system can be widely used particularly in the service industries. Six Sigma is mainly based on service efficiency, as well as on intangible asset maintenance processes. For example, Hu et al. in their research note that Six Sigma methodology plays an important role in quality assessment and development processes; it is also directly connected with cost control and competition [2].

In the financial sector, Six Sigma is mainly used in quality management processes, which are based on timely detection of potential defects. The analysis of literature on the subject has demonstrated that exactly the banks are the institutions that emphasize the role of Six Sigma system in resource saving and performance improvement process.

The issue of quality of financial products and services has become particularly topical after the financial crisis in the USA, when the banks started to pay more attention than ever to their customers and customer needs analysis. Tagahaboni-Dutta and Moreland note that Six Sigma system is considered to be one of the most effective means that entirely focuses on the customers [3]. Six Sigma is also considered an effective

formula of success strategy, which provides an opportunity for organizations to improve their entrepreneurial performance in such a way reducing or eliminating potential incongruities and inaccuracies in their work processes.

Although recently the concept of Six Sigma and its applications in the financial services sector have been widely discussed in scientific literature, this quality assurance system is not extensively used in practice yet.

The goals of the present research are to assessment Six Sigma implementation in Latvian commercial banks and to identify its perceived benefits proposed by Salaheldin and Abdelwahab [1].

To achieve the goal the authors used the sequential explanatory method, including the monographic and descriptive methods.

## II. LITERATURE REVIEW

An entire range of theoretical and empirical studies of various scopes have been conducted driven by the necessity to improve the quality of products and services.

Six Sigma system as a business strategy was initially developed by Motorola Inc, USA, in 1985 [4]. One of the main reasons for establishing a quality management instrument of that kind was a rapidly growing competition in the field of electronics, thus it became necessary to radically improve quality assurance systems [5]. According to Rucker, Citibank was one of the first banks, which started to implement Six Sigma strategy aimed at customer needs analysis, achieving customer satisfaction and building trust [6]. Later also the Bank of America started to use and implement Six Sigma quality assurance instrument [7].

Hayler and Nichols defined Six Sigma as factors and data, which can lead to the elimination of a whole range of routine processes, in such a way an organization could provide services of much higher quality to its customers [8]. Antony and Banuelas note that Six Sigma is based on statistical indicators using statistical tools, which allows reducing the fluctuations of business processes [9]. This, in turn, gives an opportunity to improve the overall performance and competence of the organization, its business strategy, and profitability [9].

Researchers studying both financial and non-financial sectors have analyzed Six Sigma and its role in quality management. For example, Kwak and Anbari state that introduction of Six Sigma will benefit the banks allowing to raise the profit of the financial sector, develop human capital, reduce potential product and service liability, as well as decrease various expenses on the bank yearbook balance sheet

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[10]. Doran in his research states that using Six Sigma strategy it is possible to reduce service charges, ensure accuracy, use information systems more efficiently, reduce potential mistakes in the lending process to a minimum, eliminating defects in accounts payable, as well as reducing inefficiency of routine operations [11]. Donnelly stresses that Six Sigma can be used not only in launching new and standardized processes, but also in improving the level of customer satisfaction [12]. At the same time, Gupta discovered that it is possible to level off the differences between financial and non-financial data annual reports, raise bank shareholder value, and enhance the accuracy of financial processes [13]. In turn, Foster has come to the conclusion that using Six Sigma banks can not only improve cash flow and profit, but can also increase return on bank assets [14].

Two types of methods are normally used in assessing Six Sigma efficiency; one is DMAIC, which implies defining, measuring, analysis, improvement and control, and DMADV, which implies comprehensive improvement of work processes.

Not only in the service industry, but also in the financial sector there are many factors that affect the success of Six Sigma implementation and development policies. On the basis of the review of the available scientific literature, it can be maintained that the factors most frequently mentioned as being the most important in Six Sigma implementation are support of organizational culture, employee training and development opportunities, concentration on strategic rather than short-term goals, focus on cutting back running costs, and continuous analysis and improvement of organizational work processes [15]-[19]. Coronado and Antony mention professional experience and knowledge of senior management, education and training aimed at professional qualification improvement, changes in organizational culture, focus on the customers and their needs and clear definition of current and future goals as being among the essential factors ensuring success of quality assurance [20].

For example, Brady and Allem in their research on organizational culture noticed that the main focus should be put on creating a sense of trust towards senior management and customer loyalty [21]. Coronado and Antony came to a similar conclusion. They have pointed out that senior management is one of the significant factors, which may facilitate restructuring of a business, as a result, it is possible to better motivate employees to take part in quality improvement processes [20]. Aravind et al. concluded that each employee plays an important role in Six Sigma development processes, thus, in order to facilitate the development of quality management instruments it is necessary to implement activities aimed at professional advancement of the employees [22]. In turn, Kwak and Anbari stress that the application of such quality assurance tool as employee training is only a part of the communication process [10]. Coronado and Antony discovered that using Six Sigma as a management strategy tool gives an opportunity to raise company value and improve company culture [20]. But Goh considers that it is rather focus on the customer, which is one

of the main factors affecting the level of customer satisfaction that can be determined using Six Sigma [23].

Six Sigma quality management system consists of several cycles: development process, initial strategy, assessment, analysis, improvement, and control.

### III. METHODOLOGY

In order to achieve results, the authors of the research have performed the qualitative analysis of scientific literature on Six Sigma and questionnaire for Six Sigma implementation at the banks.

The research was carried out from February to June 2013 in the largest banks and branches of foreign banks operating in Latvia to estimate Six Sigma implementation at Latvian commercial banks as well as to identify the perceived benefits.

Based on empirical studies performed abroad and research conducted by Salaheldin and Abdelwahab [1], a questionnaire has been developed and adapted for bank employees of Latvian commercial banks. The collected data has later been analyzed.

The questionnaire contains 51 questions that make up nine question blocks. The first question block (questions 1-4) includes demographic and personal data questions, the second block comprises the questions related to Six Sigma tools and their implementation processes at the bank (questions 5-9), the third – Six Sigma benefits (questions 10-21), the fourth – bank management support and attitude (questions 22-25), the fifth – monitoring of quality assurance processes at the bank and feedback (questions 26-29), the sixth – statistical methods and their tools (questions 30-33), the seventh – systems and procedures (questions 34-37), the eighth – application of the existing resources (questions 38-41), the ninth – employee competence and training (questions 47-51).

The questions used in the questionnaire are mainly closed questions, the evaluation of which is based on 5 point Likert scale (1 – strongly disagree, 5 – strongly agree), except the questions concerning demographic data.

The research findings have been summarized and displayed both in tables and graphically. The questionnaire has been completed by bank employees of all ranks.

Two hypotheses have been tested and adopted on the basis of the findings of Salaheldin and Abdelwahab [1].

- H1. Management executed in various forms and at various administrative levels at Latvian banks not considerably influence the processes of Six Sigma system introduction.
- H2. Management executed in various forms and at various administrative levels at Latvian banks not determines critical success factors in the process of Six Sigma system introduction.

### IV. RESEARCH DATA

One of the main aims of the survey was to poll the employees of Latvian banks and assess the implementation of Six Sigma quality management tools, as well as to evaluate the perceived benefits of their introduction.

For the purpose of data collection, 200 questionnaires were

sent by e-mail to bank employees. A total of 126 completed questionnaires were returned and considered valid.

The demographic data and personal data of bank employees showed that 72% of respondents are women, and 28% of them are men. 33% of the respondents are aged 20-29, and 46% are aged 30-39, 15% are over 40 years old and 6% are over 50. The majority of respondents, i.e. 63%, have higher education, 23% have Masters Degree, and 14% have secondary education. Talking about the period of employment at the existing bank, the majorities of respondents, or 75%, have worked from 1 to 5 years, 22% – from 5 to 10 years, while 3% have worked for more than 10 years.

The answers to the question aimed at discovering whether Six Sigma instrument was used at the bank demonstrated that such kind of instrument was not applied in the majority of banks, namely, in 82%, while 18% responded that such instrument was in place. Similar results were obtained concerning the introduction of Six Sigma strategy – 89% of respondents denied that such instrument was being introduced in their banks, whereas 11% responded positively. However, it was mentioned in several questionnaires that some other types of tools were used in particular banks to assess the quality of products and services. The obtained data have also demonstrated that foreign banks and their subsidiaries pay more attention to Six Sigma and other quality management tools than the local banks.

The answers to the survey questions concerning bank benefits gained by introducing Six Sigma strategy have been summarized in Table I.

TABLE I  
BENEFITS GAINED BY INTRODUCING SIX SIGMA STRATEGY AT LATVIAN  
COMMERCIAL BANKS

Question	Obtained results
10. Using Six Sigma, banks can reduce the costs related to various bank transfer operations	2.95
11. Using Six Sigma, banks can reduce administrative expenses	2.84
12. Six Sigma reduces the costs related to corrections made in payment orders and other types of documents	2.99
13. Introduction of Six Sigma at the bank could improve the decision-making processes and quality	3.01
14. Six Sigma is one of the main instruments that may improve internal bank business processes	2.99
15. The main aim of Six Sigma is to reduce potential mistakes in different bank operation processes to a minimum	2.89
16. Implementation of Six Sigma increases the quality of products and services	2.08
17. Six Sigma reduces the level of customer dissatisfaction and the number of complaints	2.95
18. Implementing Six Sigma it is possible to reduce customer queuing time at the customer service center	2.99
19. Six Sigma reduces customer waiting time when calling to the bank call center	2.88
20. Six Sigma increases the volume of products sold and services provided as well as improves their quality	3.09
21. Implementation of Six Sigma positively affects and improves the image and reputation of the bank	2.97

The data summarized in Table I demonstrated that the majority of respondent answers according to Likert scale were rated in the range between disagree and neither agree nor disagree. Considering the obtained data, the authors conclude

that the initially stated Hypothesis 1 has been rejected. One of the possible reasons leading to such results is that at present Six Sigma instrument is not widely used at Latvian commercial banks, thus bank employees have difficulties in making objective conclusions regarding potential benefits that can be gained as a result of the introduction of such a strategy.

The questions concerning Six Sigma introduction processes, which depend on the support and attitude of bank management, are summarized in Fig. 1.

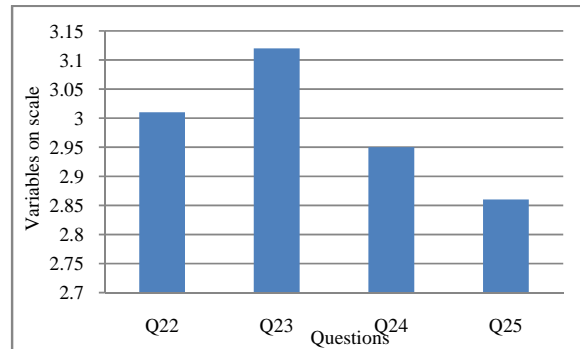


Fig. 1 Support and attitude of bank management in Six Sigma introduction process (Question 22: Bank management supports the implementation of Six Sigma strategy; question 23: The monitoring of product and service quality control is performed by a separate bank department; question 24: Heads of the departments of different ranks motivate employees to implement quality assurance processes; question 25: Introduction of the quality control system is like a management strategy of bank administration, which should be regularly improved)

The obtained data in Fig. 1 show that questions 23 is more important than 22, whereas the importance of other two questions is less than three points.

Questions related to the monitoring of quality assurance processes and the feedback from the parties involved are presented in Table II.

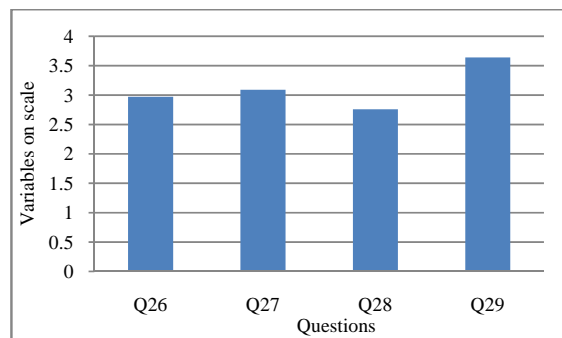


Fig. 2 Factors, which determine the monitoring of quality assurance processes and feedback (Question 26: Customer satisfaction level is constantly measured and monitored at the bank; question 27: Internal measures of quality assurance and quality improvement are constantly carried out; question 28: The opinion of the employees is always considered and accepted; question 29: Critical processes occurring at the bank are identified and necessary improvements are made)

Fig. 2 shows that the major importance respondents give for critical processes and them identification, while the less for satisfaction level, internal quality assurance and opinion of employees.

The questions concerning statistical methods and tools applied are presented in Fig. 3.

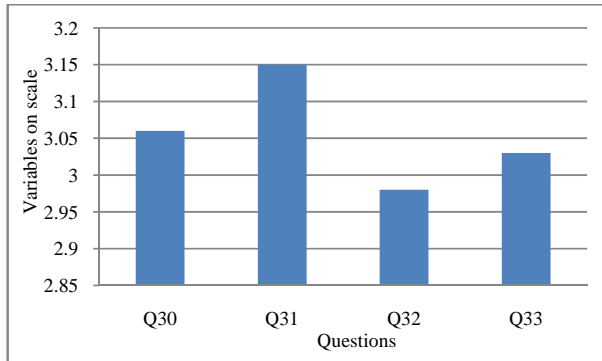


Fig. 3 Statistic methods and tools used in implementing bank strategy (Question 30: The bank uses statistic methods in planning business processes; question 31: Training on application of different methods and development principles is regularly conducted; question 32: Various marketing tools are used to improve the quality of goods and services; question 33: If necessary, different methods are used depending on the affecting factors)

The collected information about improvement tools and techniques shows that two questions (Q30 and Q31) are measured up to three point level but the other questions under the three point mark.

Systems and procedures and their depended factors are summarized in Fig. 4.

Analyzing Fig. 4, it can be seen that questions, namely, Q35 and Q36, are important and they can influence banking systems and procedures, while two questions, namely, Q34 and Q37, do not influence bank activities significantly.

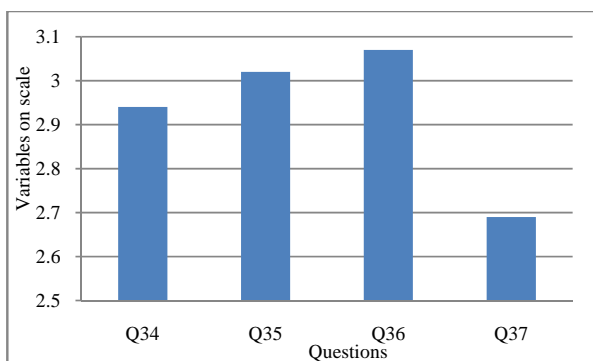


Fig. 4 Factors defining systems and procedures used at the bank (Question 34: Systems and procedures aimed at ensuring quality of bank products and services are implemented; question 35: Data storage and recording system has been established to monitor product and service improvement measures; question 36: Main bank business processes are identified and their monitoring is improved; question 37: Main bank business processes are aimed at customer needs analysis)

The answers to the survey questions concerning service factors are compared in Fig. 5.

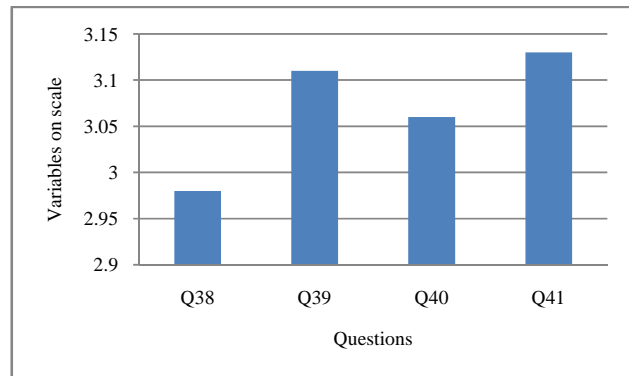


Fig. 5 Application of the resources at bank disposal for the introduction of quality management instruments (Question 38: There are sufficient financial resources available to perform quality improvement measures; question 39: Availability of human capital allows performing quality improvement measures; question 40: Questions that affect investment decisions are based on resource availability; question 41: The bank has the necessary technical resources to introduce a quality management system)

As shown by Fig. 5, questions concerning resource factors are not ascribed great importance, except questions 39 and 41.

The answers to the questions concerning bank employee education and training can be seen in Fig. 6.

The data in Fig. 6 show that training in job specific skills is considered to be the most important (Q47), while other questions do not have any significant influence on education and training factors.

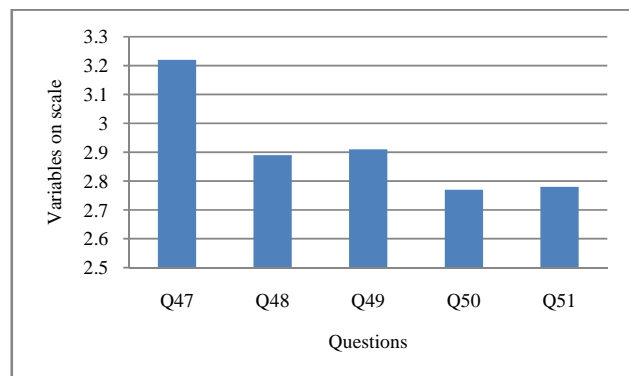


Fig. 6 Factors related to bank employee education and training (Question 47: Employees have necessary knowledge and skills to perform definite duties; question 48: Employees have necessary skills and competences to apply quality management tools and methods; question 49: Employees have developed awareness of the concept of quality system; question 50: Employees are allocated certain time for practicing new knowledge and skills acquired at professional advancement courses; question 51: Regular employee training may ensure the development of highly competent quality management team)

Having performed the assessment of the factors related to

the implementation of Six Sigma strategy at Latvian banks on the basis of polling results of bank employees, the authors have partially confirmed Hypothesis 2 (the average value on Likert scale 3.01).

At the same time, Salaheldin and Abdewahab in their research partially confirmed both hypotheses [1].

#### V.CONCLUSION

Having performed the analysis and having tested the hypotheses, the authors have come to the conclusion that there are different attitudes to Six Sigma benefits and critical success factors in the Latvian commercial banking sector. One of the hypotheses set forward in the present research, that is, Hypothesis 1, was rejected, while Hypothesis H2 was partially confirmed.

Based on the research data, the authors come to a conclusion that the banks do not have special departments that implement quality control or they use other quality assessment tools.

One of the main limitations of the present research may be the fact that the participants, who completed the questionnaire, were different department employees of different rank, and they were not always fully informed about the quality assessment system implemented in their banks. Thus, for the needs of future research, the authors plan to question only the senior management to obtain more accurate results concerning the assessment and implementation of Six Sigma at the banks.

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