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| Modernization of a legacy codebase |
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| School of Technology |
| 2024 |

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Cloud-Based Engineering**TIIVISTELMÄ**

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Opinnäytetyön nimi Modernization of a legacy codebase

Vuosi 2024

Kieli suomi

Sivumäärä 43 + 3 liitettä

Ohjaaja Rayko Toshev

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Avainsanat Vanha koodikanta, Visual Basic 6, Modernisointis

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Masters in Cloud-Based Engineering

**ABSTRACT**

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Title Modernization of a legacy codebase

Year 2024

Language Finnish

Pages 43 + 3 Appendices

Name of Supervisor Rayko Toshev

The purpose of this thesis was to develop a transitioning strategy from a legacy codebase to a modern solution. The study will investigate reasons why a codebase should be modernized, how it should be done, and what it will cost.

The main programming language in the target company is Visual Basic 6. The first part of this thesis focuses on the challenges VB6 has today. This study will investigate what kinds of features is it lacking and how modern tools are no longer tailored towards it. This study will also include a risk analysis on what kind of challenges would the target company face if Microsoft dropped VB6 support from its future releases.

The second part focuses on how can marketing and sales leverage modern solutions. At the core of any development should be business need and value generation. It is important to realize market value when beginning large projects. This thesis includes a qualitative interview with the marketing and sales personnel from the target company.

The final part of this thesis focuses on how the target company could achieve transitioning to a modern codebase. This thesis will investigate software architecture, which programming languages should be used, and what other technologies can be employed. The final product of this thesis is a migration roadmap for the target company.

Keywords Legacy codebase, Visual Basic 6, Modernization

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# Introduction

The term “Legacy code” is not clearly defined. Some say it is code without tests. Some extreme definitions say code becomes legacy code as soon as it is written. The definition I like the best is “Legacy code is valuable code that you’re afraid to change” (Carlo, 2024). This definition leaves room for improvement.

Legacy code comes with several hindrances that have business impact. Legacy code cause longer development times, longer QA times, and difficulties implementing continuous integration practises. The development team can simply do less in a given amount of time. This in turn can have customers feeling ignored and unhappy. (Magalhães, 2020)

This thesis explores some of the issues and unrealized gains the target company is experiencing. The focus is on the codebase written in Visual Basic 6. VB6 is a programming language that was developed by Microsoft in 1998. This thesis will cover what kind of support is expected from Microsoft, how modern tools apply for VB6, and some modern programming concepts VB6 fails to deliver.

In the second part of this thesis, a qualitative interview will be presented. This interview focuses on the business benefits that a modern software can have from the perspective of marketing and sales business units.

The final part of this thesis will be about modernizing the software architecture of the target company.

The study will include choosing the right tools for the company.

## Examples of figures and tables

# visual basic 6 deprecation

Microsoft has reduced the amount of support they are providing for VB6. In an article Microsoft published, they say they are committed to “It just works” compatibility for VB6 Windows systems up to Windows 11. The article has been revised several times to include the latest Windows version. (Microsoft, 1.4.2024)

Despite the promising name of the support scheme, the support only extends to the VB6 runtime files. Runtime files will work for a minimum of 5 years after the release of Windows 11. After 5 years, Microsoft promises 5 years of extended support. The support offered by Microsoft is limited to serious regressions and critical security issues. Development platform for Visual Basic 6 has been out of support since 2008. (Microsoft, 1.4.2024)

## VB6 shortcomings

Due to the lack of further development, several modern concepts and architectures are not supported on VB6. These shortcomings can make developing applications more difficult and costly.

Visual Basic 6 and any application written on it, can only be run as a 32-bit application (Microsoft, 1.4.2024). 32-bit applications have several disadvantages compared to the newer 64-bit architecture. One disadvantage a developer may run into is the limited memory capacity of the 32-bit architecture. 32-bit applications can only reserve up to 4GB RAM. This can be a limiting factor and a liability if applications cannot handle the limited environment. (GeeksForGeeks, 5.2.2024)

## Business impact

Finding skilled professionals becomes more difficult as the popularity of a technology decreases. This can make finding candidates for hire take longer and increase candidate’s expectations of salary.

TIOBE is an organization that tracks and analyses the popularity of programming languages. TIOBE’s data is based on availability of skilled engineers, courses, and third-party vendors. According to their statistics, Classic Visual Basic has fallen from 2% popularity in 2015, to 1% popularity in 2024. They define Classic Visual Basic to include both VB6 and VBA, a programming language used withing applications such as Excel. Additionally, they make it known that due to ambiguity between all the versions of Visual Basic, there is only 50% confidence in assigning which Visual Basic should be credited. (TIOBE, 5/2024)

The number of job postings for VB6 has decreased. Meanwhile, salaries for VB6 developers have increased faster than some its peers. In the UK, the proportion of job postings in IT sector citing VB6 has decreased from roughly 1.8% to less than 0.1%. In the same period, salaries have increased from roughly 30 000£ to 60 000£. In the same period, C# developer salaries have increased from 40 000£ to 60 000£. (ITJobsWatch, 10.5.2024)

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# Appendices

APPENDIX 1

**WHAT TO INCLUDE TO APPENDICES**

You can enclose as appendices for example a questionnaire used in the study or other material that is related to the study.

Material that the client wished to classify can be enclosed as an appendix; in this case, the appendix is not included in the published version submitted to Theseus or in the hardbound version.

**THE TITLES AND NUMBERING OF APPENDICES**

The appendices are numbered and given a title. When you refer to an appendix in the text, use the correct referencing practice. Remember to mention the number of the appendix.

APPENDIX 2