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Bachelor in Computer Science

Accelerating SQL with Complex Visual Querying

Dissertation plan submitted in partial fulfillment
of the requirements for the degree of

Master of Science in
Computer Science and Informatics Engineering

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Abstract

The dissertation must contain two versions of the abstract, one in the same language as the main text, another in a different language. The package assumes that the two languages under consideration are always Portuguese and English.

The package will sort the abstracts in the appropriate order. This means that the first abstract will be in the same language as the main text, followed by the abstract in the other language, and then followed by the main text. For example, if the dissertation is written in Portuguese, first will come the summary in Portuguese and then in English, followed by the main text in Portuguese. If the dissertation is written in English, first will come the summary in English and then in Portuguese, followed by the main text in English.

The abstract shoul not exceed one page and should answer the following questions:

- What's the problem?

- Why is it interesting?

- What's the solution?

- What follows from the solution?

Keywords: Keywords (in English) . . .

Resumo

Independentemente da língua em que está escrita a dissertação, é necessário um resumo na língua do texto principal e um resumo noutra língua. Assume-se que as duas línguas em questão serão sempre o Português e o Inglês.

O *template* colocará automaticamente em primeiro lugar o resumo na língua do texto principal e depois o resumo na outra língua. Por exemplo, se a dissertação está escrita em Português, primeiro aparecerá o resumo em Português, depois em Inglês, seguido do texto principal em Português. Se a dissertação está escrita em Inglês, primeiro aparecerá o resumo em Inglês, depois em Português, seguido do texto principal em Inglês.

O resumo não deve exceder uma página e deve responder às seguintes questões:

- Qual é o problema?

- Porque é que ele é interessante?

- Qual é a solução?

- O que resulta (implicações) da solução?

E agora vamos fazer um teste com uma quebra de linha no hífen a ver se a LaTeX duplica o hífen na linha seguinte...

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Sim! Funciona! :)

Palavras-chave: Palavras-chave (em Português) . . .

Contents

Introduction

This project was developed on a particular environment, so this chapter will introduce this thesis, starting by all the contextualization about the company, the product, and its section which will be the nuclear focus of this thesis, followed by describing the motivation behind it. In addition, will be presented an overview of the problem, such expected contributions and the structure of the document.

1.1 Context

Once this project was proposed to improve the visual way that the users of the OutSystems Platform can query data, in this section, will be provided first some context about the OutSystems, in order to obtain an overview of the product. After this, also will be provided with a description of Aggregates, which is the current OutSystems feature to build queries through a visual interaction.

1.1.1 OutSystems Context

In this section will be presented an overview of OutSystems Platform. The idea here is to start describing first what are the main features of the product, and next to indicate briefly how is the impact of the product on the market.

1.1.2 Aggregates Context

The main topic of this thesis is the expressiveness and the experience of Aggregates. Thus, in this section will be explained what is the Aggregates Feature, how can be used to provides a better experience to the users.

1.2   Motivation

It will be presented the motivation behind this project. So, it will be explained what are the user possibilities to build queries, including visual and not visual ways, and what are the problems related with them. Also, will be presented what is the company motivation to do this project, since users can do the queries that they want in different ways.

1.3   Problem Description

In this section, will be presented generally the problem of this thesis. The goal of this section is to provide a global view of the problem without many details.

1.4   Research Questions

Here, will be enumerated the most important question which guides the workflow (e.g. Can we enable OutSystems developers to easily do most kinds of database queries without ever using SQL?). The goal is to do all the research and development in order to obtain answers to all of these questions.

1.5   Main Expected Contributions

In the Main Expected Contributions, will be enumerated what are the thesis contributions to this work and to the proposed final solution.

1.6   Structure

The remaining chapters of this thesis are organized as follows:

- Chapter 2 - Related Work: presents a short description of the OutSystems Platform, as well as a description of the existing techniques that already exist on the context of the main topic of this thesis - data visualization and visual querying. Besides, will be enumerated other commercial applications which can have relevant content for this study;

- Chapter 3 - Proposed Solution: describes the proposed solution, starting with a requirements analysis, followed by a more detailed explanation about the problem, and finally with a definition of the development scope to understand what problem will be tackled on detail;

- Chapter 4 - Work Plan: includes a planning of the total work inherent. Thus, will be presented an overview of the tasks that was done on this dissertation plan, together with the preview of the work which will be the focus of the second phase of the thesis, the elaboration.

CHAPTER

RELATED WORK

On this thesis, will be pretended to apply Human-computer interaction (HCI), Data Visualization and Visual Querying concepts, techniques and technologies to improve a Visual Querying Feature of the OutSystems Low-code Development Platform. Thus, in this chapter will be presented the results of a study that analysed what is the Low-code development platform background and its actual situation, as well as what are the techniques and technologies which already exist, including some comparison between them. Finally, will be enumerated what products, technologies and tools exist on other commercial applications which can be related with the topics of this thesis.

2.1 OutSystems Background

All of this thesis has the aim of improving OutSystems Platform, so it is very important to understand what is that product and what can be developed with that. This section provides an overview of this Low-code Development Platform, describing its value proposal, and its technological goals and approaches. In addition, it will be used some images to illustrate some relevant aspects of the platform.

2.2 Techniques

After all the research is done, in this section will be presented a summary of interesting techniques found, which can be very util to the analysis and development phases. The main focus is to find a set of techniques that help to find solutions to the problems of this thesis.

2.3   Technologies

Such as the techniques research, it is also very important to search what are the technologies related with the subjects of this thesis that already exist, once this knowledge can be very important to the concept of a solution proposal. In this way, in this section will be enumerated with a brief description of what are the related technologies which are relevant to this project.

2.4   Commercial Applications

In any research, the academic content should not be the only taken into account, because sometimes the knowledge does not evolve only in the research centres but also in the companies. Since this thesis are made to improve a company product, the previous assertion has additional strength, so will be introduced commercial applications which can be util to all this process.

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P ROPOSED S OLUTION

3.1   Requirements Analysis

3.2   Proposed Implementation

3.3   Scope Definition

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WORK PLAN