**Interim Report**

**EE5500**

Name: Wojciech Lesnianski

Student number: 1644612

Electronic and Computer Engineering

School of Engineering and Design



Dr. Ali Mousavi

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Table of content

[Introduction 3](#_Toc493958354)

[Background to the project 3](#_Toc493958355)

[Initial survey 5](#_Toc493958356)

[Aims and Objectives 5](#_Toc493958357)

[Experimental/investigative methods to be adopted 5](#_Toc493958358)

[Time-plan 5](#_Toc493958359)

[Deliverables or specific outcomes 5](#_Toc493958360)

# Introduction

This section should briefly overview the project topic.

Acquisition, analysis and modelling of historical and realtime water-plant data.

Overcoming some of the existing barriers of interoperability and harmonisation of data and information.

**[Quelle: 1]**

Access to clean water is the most basic and fundamental type of the human infrastructure. The quality of life highly depends on the accessibility to clean water. We require water not only for drinking, but also for cooking, and washing. Additionally, various professions and commercial establishments, like farmers or restaurants, could not exist without certain quality and quantity of water. The quantity of clean water in most cases, depends on collecting water and sewage from rivers and lakes, cleaning it in dedicated water-plants and thus bringing it to a specific quality standard, and then distributing it back into the waters.

A software groundwork for acquisition, analysis and modelling of historical and real-time data of water-plants will be the main topic of this master thesis. The Project will be done in partner work, although the tasks will be strictly separated and the outcome of one part of the project won’t affect the outcome of the other part. This dissertation is dealing with the problem of acquiring, harmonizing and providing water-related data and leaves the analysis and presentation to the partner project.

**[Quelle: 2]** The specific cleaning process in the United Kingdom consists of 7 steps, which will be described in a later chapter:



***(Source:*** [***http://www.water.org.uk/about-water-uk/wastewater 18.09.2017***](http://www.water.org.uk/about-water-uk/wastewater%2018.09.2017)***)***

The most individuals will be interested in the outcome of step 7, which also indicates the quality of water available for public usage, nonetheless the incoming and outgoing water of the other steps provides different kind of data which might be interesting for different kind of reports, especially due to the fact, that each step deals with a specific problem, meaning that all possible to gather data will also be gathered harmonized and stored by our system, for further investigation.

# Background to the project

This section should provide a more detailed review of the technical field, largely based upon survey material.

*Despite billions of Pounds invested in securing the nation’s precious water resources, mains water cannot be guaranteed even today, and this problem will become more severe*

**(Quelle:** [**http://www.water.org.uk/consumers/what-water-companies-do**](http://www.water.org.uk/consumers/what-water-companies-do) **&& [3])**

On average it costs a UK customer 1 pound a day to drink high quality water. This money goes into the water and wastewater treatment of around 16 billion litres of wastewater, gathered in around 345.000km of sewers, in around 9000 wastewater plants – every day.

**(Quelle: http://www.water.org.uk/about-water-uk/regulation)**

Quality of water in the United Kingdom is ensured by a number of organisations consisting of governmental, regulator and consumer organisations, all of them having their own task including the following:

* Governments
  + Defra
    - Looking after the natural environment
    - Supporting the food and farming industry
    - Sustaining a thriving rural economy
  + Welsh Government
    - Improving the lives of people in wales
* Regulators
  + Drinking Water Inspectorate
    - Providing independent reassurance about UKs water quality
  + [Environment Agency](https://www.gov.uk/government/organisations/environment-agency)
    - Regulating industry waste
    - Regulating water quality and resources in England
    - Managing the risk of flooding from rivers, reservoirs, estuaries and the sea
  + [Natural England](https://www.gov.uk/government/organisations/natural-england)
    - Helping to protect England’s nature and landscapes
  + [Natural Resources Wales](https://naturalresources.wales/?lang=en)
    - Ensuring sustainability of resources in England
  + [Ofwat](https://www.ofwat.gov.uk/) (for England & Wales) and WICS (for Schottland)
    - Regulating the water and sewerage sectors
    - Setting price limits for customers
    - Ensuring companies run efficiently
    - Encouraging resilience
* Customer Watchdog
  + CCWater
    - Promoting customers interests to governments, regulators and water companies
    - Providing advice and complaint handling service for customers

**(Quelle:** [**http://www.legislation.gov.uk**](http://www.legislation.gov.uk) **& [3])**

The water supply regulations, set by the government, regulate the water treatment process of every water provider whose area is wholly or partially in the United Kingdom. The list of indicator parameters is long and contains minimum, maximum values and ranges within which values are allowed to lie. Only if all regulations apply the water may be called drinking water. With all the regulations and monitoring organisations the quality of UKs water might seem assured – yet the process of doing so is very troublesome and laborious. Twelve big companies, responsible for water and sewerage, cover most of UKs water supply. Additionally, there are some water-only companies providing water for some of the remaining regions.



**(Source:** [**http://www.ofwat.gov.uk/households/your-water-company/map/**](http://www.ofwat.gov.uk/households/your-water-company/map/)**)**

The water quality is regulated UK-wide, yet the way the different companies ensure their quality and monitor their water treatment process is not unified. This makes comparison between companies, as well as getting a overall picture difficult.

# Initial survey

This survey is a quick preliminary survey, to discover something of the 'shape' of the relevant field of information; in doing this you will identify key abstracts, journals, books, series of reports, and so on. Key technical issues will be summarised.

Take inspiration and technology currently in use by communication service providers in mobile industries – who obviously managed to find a common way to communicate

# Aims and Objectives

A clear statement of the Aims and Objectives. Remember, aims and objectives are generally a statement of what is to be achieved, not how it is to be achieved.

The purpose of this project is to investigate and design knowledge and data engineering (KDE) infrastructure for strategic and large scale water and waste water treatment processes (WWTP). By KDE of water treatment operations we mean the building of the essential capabilities for acquisition, analysis and modelling of the data to create the knowledge for large scale (regional, national and international) strategic planning of water supply and consumption.

# Experimental/investigative methods to be adopted

An outline of the key activities necessary to complete the project, itemising the experimental methods to be used (in, for example, a design-based project), or the investigative techniques to be adopted (in the case of, say, a critical survey).

# Time-plan

Strongly related to the key activities identified above.

# Deliverables or specific outcomes

A clear statement of the expected outcome(s).