# CUCCIBU ANALYSIS TOOL

14-01-2019

# Preface

My name is Rick Jeurissen, ICT & Software Engineering student at Fontys Hogeschool. As a third year student I did an internship at Cuccibu BV in Eindhoven where I developed an analysis tool from the start. From September 3, 2018 to January 18, 2019, I was busy with my internship assignment and writing the report. Towards the end of my internship I wrote this report.

The internship assignment was carried out at the office located at Meerenakkerplein in Eindhoven. At the time of writing this report, the company does not yet have a software department, but the owners want to change this. Part of the reason for hiring a software intern was to observe how a software assignment would work out within the company.

I learned a lot during my internship period. I have progressed in both technical knowledge and professional development. The company has a monthly meeting where all colleagues come together to share the work with everyone. Presentations are also given of research findings and experiences of a trip to customers abroad. I also had to present my progress to colleagues several times. This results in a professional company atmosphere and has contributed a lot to my professional development.

During my internship I was well guided by my internship supervisor xxx. I would like to thank xxx for the indispensable support I have received. xxx ensured that all necessary resources for the realization of the project were available and guided me in the right direction in the development process towards the end product.

I would also like to thank all the other colleagues at Cuccibu for the feedback, help and great office atmosphere. You played a major role in the good experience during my internship period!

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# Summary

Cuccibu BV is a company founded in 2014 and specializes in IT Risk Management, IT Audit, Privacy, Information Security and Cyber   Security. The company had no experience with developing software yet, but they wanted to orientate themselves in this. The company came up with the following question: "How do we develop a software tool that helps retrieve external data to assist a competitive analysis". This is where my internship assignment started.

To provide a solution to the above question, an application has been realized that assists a competition analysis. This product cannot be realized ready-to-market within the internship period, so the assignment is shortened to a Proof of Concept. This means that the delivered application must be a good basis for expanding and improving the functionality.

There is an awful lot of information available on the internet and it has both advantages and disadvantages. This information is made accessible by search engines such as Google, Yahoo and Bing. The retrieval of these web pages is automated and inspected with software. This requires some manually entered parameters and results in the following process flow:

1. User enters own website as comparison material and clicks on execute.
2. Application collects service data about company website entered.
3. Application collects comparable companies based on obtained service data.
4. Application gives the user the option to filter for potential companies.
5. Application displays a comparison of the services other companies provide and the entered website does not.

The Cuccibu Analysis Tool was developed within 5 months and contains an extra feature that has been implemented to demonstrate that the software is extensible. This additional feature provides the ability to search for potential partners by suggesting a number of companies based on a manually entered industry. After collecting potential partners, the user is requested to select several companies in the application to send a request for quotation via email.


The most important requirements for the application have been met. However, the application is made to be expanded. Suggestions are described in the chapter 'Conclusion and recommendation'.

## Resume

Cuccibu BV is a company that was founded in 2014 and specializes in IT Risk Management, IT Audit, Privacy, Information Security and Cyber   Security. The company had no experience with developing software yet, but they want to orientate themselves here. The company came up with the following question: "How do we develop a software tool that helps retrieve external data to assist a competition analysis?". My internship assignment started here.

To provide a solution for the above question, an application has been realized that will assist a competitive analysis. This product cannot be realized market-ready within the internship period, so the assignmen tis shortened to a Proof of Concept. This means that the delivered application must be a good basis for expanding and improving the functionality.

There is a lot of information available on the internet and has both advantages and disadvantages. This information is made accessible by search engines such as Google, Yahoo and Bing. The retrieval of these web pages is automated and inspected with software. There are some manually entered parameters required for this and results in the following process flow:

1. User enters his own company website as comparison material and clicks on execute
2. Application collects service data about the entered company website
3. Application collects comparable companies on the basis of obtained service data
4. Application gives the user the possibility to filter on potential companies
5. Application shows a comparison of the services other companies do offer and the entered website does not.

The Cuccibu Analysis Tool was developed within 5 months and contains an extra feature that has been implemented to show that the software has been extensively set up. This extra feature allows the possibility to search for potential partners by suggesting a number of companies on the basis of a manually entered branch. After collecting potential partners, the user is requested to select several companies in the application to send a request for quotation via email.

All the requirements for the application have been realized. However, the application is made to be extended. Suggestions are described in the chapter Conclusion and recommendation.

# Glossary

| Word | Clarification |
|---|---|
| Analysis | Single analysis |
| Analysis | Multiple analyses |
| Cuccibu | Internship company |
| Big Data | Large-scale amount of unstructured information that can add value to a company |
| application | A computer program intended for end users. |
| Tools | Cuccibu Analysis Tool |
| Back end | Data access layer of an application. Invisible software for the user and is the point of contact for the front-end |
| Front end | Presentation layer of an application. The user can indicate through a visual display which actions must be performed. These requests are processed by the back-end |
| CI | competitive intelligence |
| CA | Competitive Analysis |
| Primary company | The entered website url in a competitive analysis |
| Web crawler | Automated website visits and storage in cache or database |

# 1 Introduction

Due to the increase in data traffic and technological developments, more and more companies are automating daily tasks. Tasks such as promoting a company automatically, searching for potential applicants on LinkedIn, suggesting interesting videos and displaying the right advertisement on a website already exist. Yet there is enough demand for automating tasks that have not yet been created. Cuccibu is a broad progressive company and has an idea to get involved. Search engines such as Google, Bing and Yahoo make the internet more accessible by making as much information as possible available to users. Cuccibu wonders if it is possible whether the information made available by these search engines can be used to map the competitive landscape.

**Reading Guide**

Chapter 3.1 describes the reason for the assignment. The final assignment is described in chapter 3.2. The research question was posed in chapter 3.3. The purpose of the assignment is described in chapter 3.4. The requirements and wishes of the assignment are formulated in chapter 3.6. In chapter 3.7 the research strategies and development methods used are described.

Chapter 4.1 describes how the project plan took shape, what the architecture of the application is, which development environment and programming languages   were used and which version management system was used. Chapter 4.2 describes how the frontend is set up, what is used for it and what the screens look like. Chapter 4.3 describes how the backend is set up, what has been used for it, which components have been realized for it and how these components work.

## 2. Cuccibu BV



Cuccibu was founded in 2014 by two IT professionals. Now, 4 years later, Cuccibu has grown into a medium-sized company that focuses on four pillars: IT GRC Services, IT Risk, Privacy and Cyber  Security. By focusing on four pillars, Cuccibu is able to provide advice on an issue from different angles. At the moment, Cuccibu is mainly active for the local government, but it also provides services to healthcare institutions. This does not mean that Cuccibu has no software development activities. Cuccibu would like to start developing software and is also the reason for this assignment.

The pillars are shown in the Cuccibu organizational chart below.
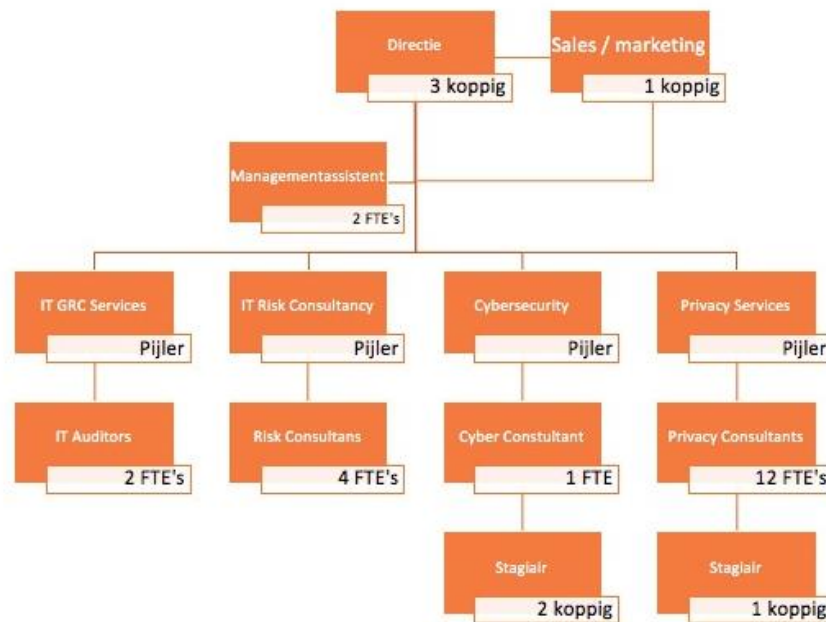
# 3. Cuccibu Analysis Tool

This chapter contains details about the internship assignment performed. The reader learns everything about the initial situation of the project, the purpose of the project and what the assignment consists of. The internship started with an assignment description that was not yet complete. Over time, the assignment has taken on this form. The way to get there is described in this chapter.

## 3.1 Reason for assignment

Cuccibu wants to make competitive analysis easier. The large amount of data available on the internet can help Cuccibu with this. It is known that the data is available, but do not know how to obtain it. The first sketch of the assignment can be described by means of the following points:

- ○ Investigate how the data is obtained
- ○ Process the information so that it can provide a solution to the question
- ○ Presenting a conclusion in an application

After brainstorming with colleagues, ideas have come up. A colleague came up with the term Competitive Intelligence. Companies mainly focus on Business Intelligence and Organizational Intelligence. This is often internally focused and ensures that external data from competitors, for example, is not looked at. Competitive Intelligence is a process that makes the company more competitive.



**Competitive**                                                       **Intelligence**

By researching competitors and industry trends, Competitive Intelligence (CI) can add to company success. CI is the action of defining, collecting and analyzing information about products, customers, competitors and all aspects of the environment necessary to support executives and managers in making strategic decisions for a company. Much of this type of business information can be retrieved from the Internet, for example through publish reports, financial statements, websites and articles. This is called secondary research. This information can be obtained indirectly through search engines (Google, Yahoo, Bing). Secondary Research is helpful because it allows looking at a large scale of information. The disadvantage of Secondary Research is that it is not always up-to-date data. primary research is

obtaining this information directly through conversations with industry experts, competitors, vendors and customers. The advantage of Primary research is that it provides the most accurate and up-to-date information on how the competitive landscape works. The disadvantage is that companies do not like to share their information or that there is an intermediary who sells the information. The information obtained is finally analysed. The result of this process is called CI.

## 3.2. Final assignment

The assignment consists of realizing an application (Cuccibu Analysis Tool) that makes it easier to perform a competitive analysis by automating part of it. The assignment is both complex and extensive. This ensures that the final delivery is a well-structured and expandable Proof of Concept. The application starts an analysis based on a manually entered company website. The application retrieves the services from the entered website and compares them with other companies that have matching services.

A full competitive analysis generally identifies the following aspects:

- O Products – What does the company
- O offer? Prices – What prices are asked?
- O Promoting – What activities do they carry out to promote their products?
- O Location – Where do they sell the products?
- O Customers – What customers do they have?
- O Other – What is their sales force structure? What are their technical problems?

With regard to the competitive analysis, the application only focuses on getting the products and visualizing the comparison. In addition to performing an automated competitive analysis, the application also offers consultancy functionality. A consultancy analysis can be performed to search for potential partners, after which invoice requests are sent. If a customer has found a partner through the tool, Cuccibu receives a small margin of the final proceeds for advising a new partner. This second analysis has been implemented so that it provides insight into how easy it is to extend the application.

### 3.3 Research question

Based on the assignment description, we pose the following research question: "How do we develop a software tool that helps retrieve external data to assist a competitive analysis". The application offers a solution for this.

### 3.4 Purpose

The purpose of the assignment is to develop an application that can assist in conducting a competitive analysis. The delivered application is a Proof of Concept in which it is important that the software is structured flexibly. The analyzes are easy to start and means that every parameter entered when starting an analysis must be accepted and that the result depends on the content of an adjustable dataset.

### 3.5 Scope

The client gives no restrictions on the use of programming languages. The following programming languages   were used to develop the application:

- Java
- HTML
- javascript
- c.s.s
- sql

The client indicates that the software must be developed in a continuously structured manner. This means that a development method is used. The development method used for this project is KANBAN and is realized by using Trello. More depth can be found in the sub-chapter 'Development method'.

All analyzes must be implemented flexibly. This means that it must be possible to carry out analyzes regardless of what kind of industries a company has. Think of Cyber  Security, Software, Privacy Services, etc. Each entered parameter must be accepted and the result depends on the content of an adjustable dataset.

### 3.6 Requirements of the assignment

The functional requirements are described using the MoSCoW method. This functionality was implemented at the end of the internship period. The Non-functional requirements have been demonstrated by means of the ISO 25010 standard.

### 3.6.1 Functional requirements

| ID | Urgency | Description |
|---|---|---|
| R1 | MUST | Perform competitive analysis |
| R2 | MUST | Perform consultancy analysis |
| R3 | MUST | View analysis overview |
| R4 | MUST | View competitive analysis |
| R5 | MUST | Perform competitive analysis comparison |
| R6 | MUST | View consultancy analysis |
| R7 | MUST | Send consultancy analysis invoice request |
| R8 | SHOULD | Show backend statistics in dashboard |
| R9 | COULD | Login system |
| R10 | COULD | Outsourcing website pool |

### 3.6.2 Non-functional requirements

| ID | Category | Description |
|---|---|---|
| NR1 | Performance | The web application has a response time of up to 1 second |
| NR2 | Performance | It process from a competitive analysis takes no longer than 3 minutes |
| NR3 | maintainability | It system is modular built up |

| NR4 | maintainability | The code is written according to a                    recognized encryption standard |
| NR6 | Usability | The design of the web application must be user-friendly |

## 3.7 Development method

The software development method used is KANBAN. This method was chosen because the application is developed in small steps. This is because items have been implemented that were not known at an early stage. By working in this way, a demo can be delivered quickly and helps with structured work towards the end product. Executing the demo delivery results in feedback from colleagues who have added value to the application.

Persistence development method is supported by Trello. Trello helps keep track of important KANBAN elements such as:

- Back log items
- Weekly activities
- Future ideas
- Rounded Items
- Items in development

In              below                        image                        is                this                    to display:
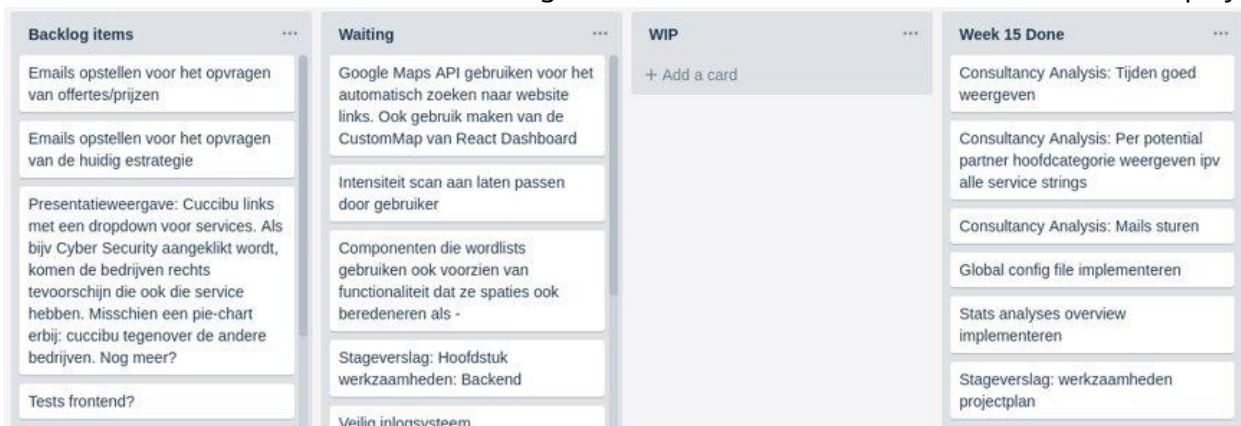


On the left side of the image is a column for the items the client wants implemented. The 'Waiting' column is filled with items that must be implemented by developers within a certain period of time. The WIP column is populated with items currently being implemented by developers. The following columns are filled with items that have been implemented per week to indicate what has happened in the entire process. After the internship is completed, this Trello board will continue to exist for the future employee to further develop the ideas described.

### 3.7.1 Research strategies

For this application, communication between client and server is indispensable. A server must handle multiple requests at the same time and the website must be neat and user-friendly. Information on these topics can be found on the Internet. These activities are included in the chapter 'Activities'.

The written code of the application can always be more efficient and better structured. This can significantly reduce the time it takes to run, retrieve, and display analytics. These improvements have been carried out methodically and are documented by means of the development method used. These studies fall under the 'Workplace' strategy.

## 4. Activities

This chapter describes what kind of work has been carried out, how this has been achieved in general terms and why it has been carried out in this way. This text also makes it clear in which systematic way the end product has been worked on. These descriptions are technically described to some extent.

### 4.1. Project Plan

Before a concrete assignment description can be described, it is important to first come up with a clear assignment. The initial set-up was vague and has been improved by asking questions to colleagues. The term Competitive Intelligence (CI) was discussed and was a good starting point for the first researches of the internship assignment for the realization of an automated competitive analysis.

### 4.2. Architecture

The architecture of the entire application is prepared in advance. To begin with, a process flow has been devised. This flow is shown below:



A user indicates that a competitive analysis must be carried out. The user is prompted to enter their own company website and then clicks "Search". First of all, the entered website is scanned for services, so that they can be compared later. Once done, it will search for matching company websites. These company websites are scanned and used only if they have similar services to the primary website. Ultimately, the conclusion must be shown on the user's screen. The user should be given the option here to filter for certain services and display a conclusion summary that shows which services other companies have and the primary company does not.

In the project, the frontend is separated from the backend. A frontend server can also be understood as a website, web application or presentation layer. In an architecture diagram, the frontend is drawn next to the backend but is completely separate from each other. A backend server is an application that can process requests from a user (via the frontend) and also provide the frontend with a result. A backend server also handles communication between the frontend and a database. The architecture of the entire application is shown in the sketch below.
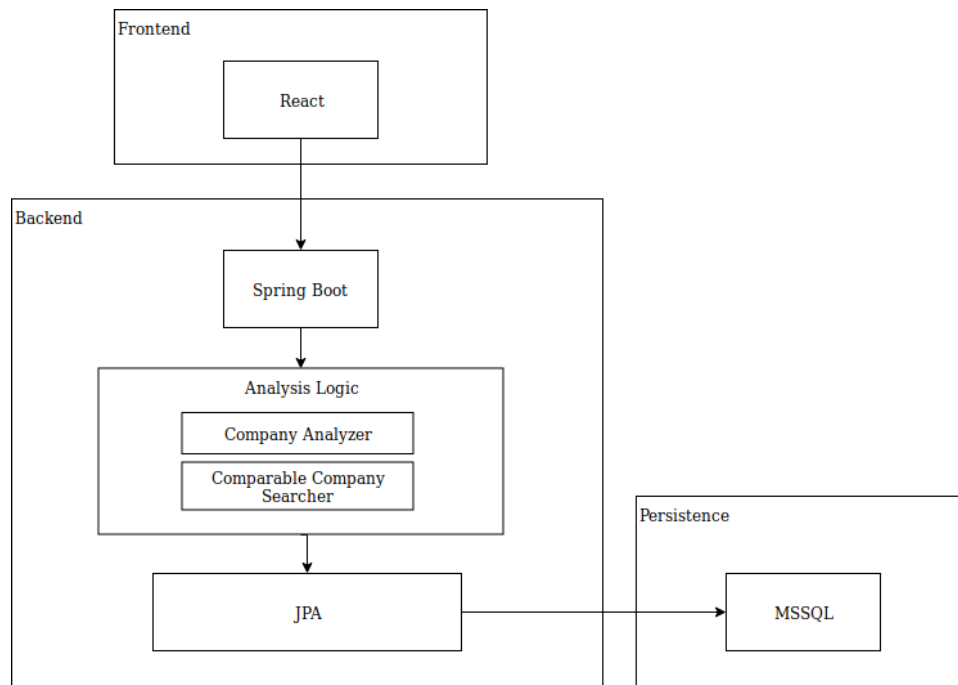


### 4.1.6 Development Environment and Programming Languages

All code is programmed using IntelliJ from Jetbrains. The backend code is written in Java. The framework used for communication between frontend and backend is called Spring Boot Framework. The frontend code is written in Javascript and the user interface framework used is called ReactJS. Java Persistence API is used to store data. The justification for why these frameworks have been chosen is described in chapters 4.2 and 4.3.

### 4.1.7 Version Management

Version management uses FHICT GitLab. This Fontys service is used because it was set up for students. Version control is essential for development, because it gives developers insight into the timeline of building the application. Developers can also go back in the history of the project. After the internship, the git repository is saved so that the next employee can work with it.

## 4.2 Front End

The frontend is set up using the ReactJS framework. This framework is a JavaScript library for creating user interfaces. ReactJS was chosen because the written code that is written is modular and clean. This breaks the entire project down into reusable components

and ensures higher development productivity. A component can be anything, such as a clickable button, login fields and tables, etc. Packages designed by external developers are added using NPM. NPM stands for NodeJS Package Manager and is designed for developers to both borrow and share packages publicly. A package can also be understood as a library with code that has been realized by other developers.

### 4.2.1 Packages

The following packages are used for the frontend:

| Name | Version | Description |
|---|---|---|
| bootstrap | 3.3.7 | Powerful front-end styling framework for faster and easier web development |
| react | 16.2.0 | React is a JavaScript library for creating user interfaces |
| React checkbox tree | 1.4.1 | Simple and elegant checkbox tree for React |
| React loading animation | latest | Animated spinner for data loading |
| React svg pie chart | 2.1.1 | responsive pie chart component |

### 4.2.2 Project

For the user interface, an existing template has been used to save time on designing new components. A free dashboard template called: 'Light Bootstrap Dashboard' from Creative Tim was used. This template contains the MIT license and means that anyone can copy, modify, merge, publish, distribute or sell this template. The template can be viewed on the website by means of a demo . We chose this template because of its clear and user-friendly layout. This is where the development for the frontend started. The main screen is shown in the image below:
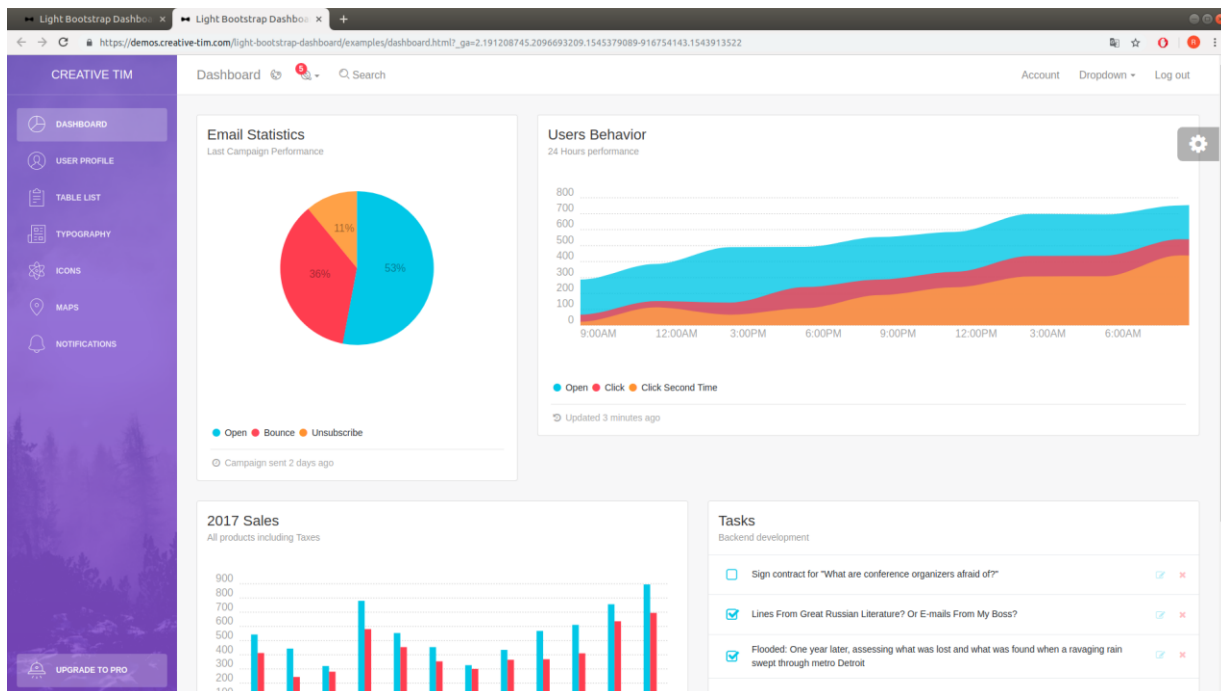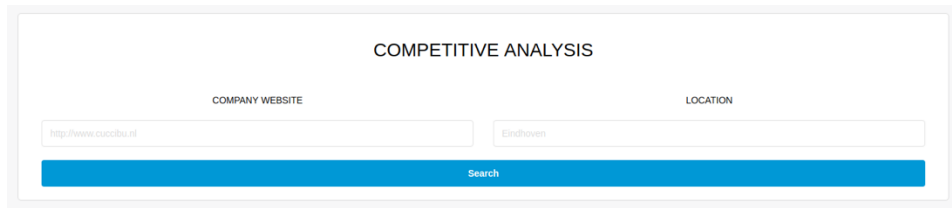
The template was provided with a lot of functionality that had no added value to the application to be built. All unnecessary functionality has been removed from this project.

### 4.2.3 Views

The main page of the web application should provide the user with information about what functionality the tool has to offer. This page also gives the user the possibility to perform analyses. The main page is shown in the image below.
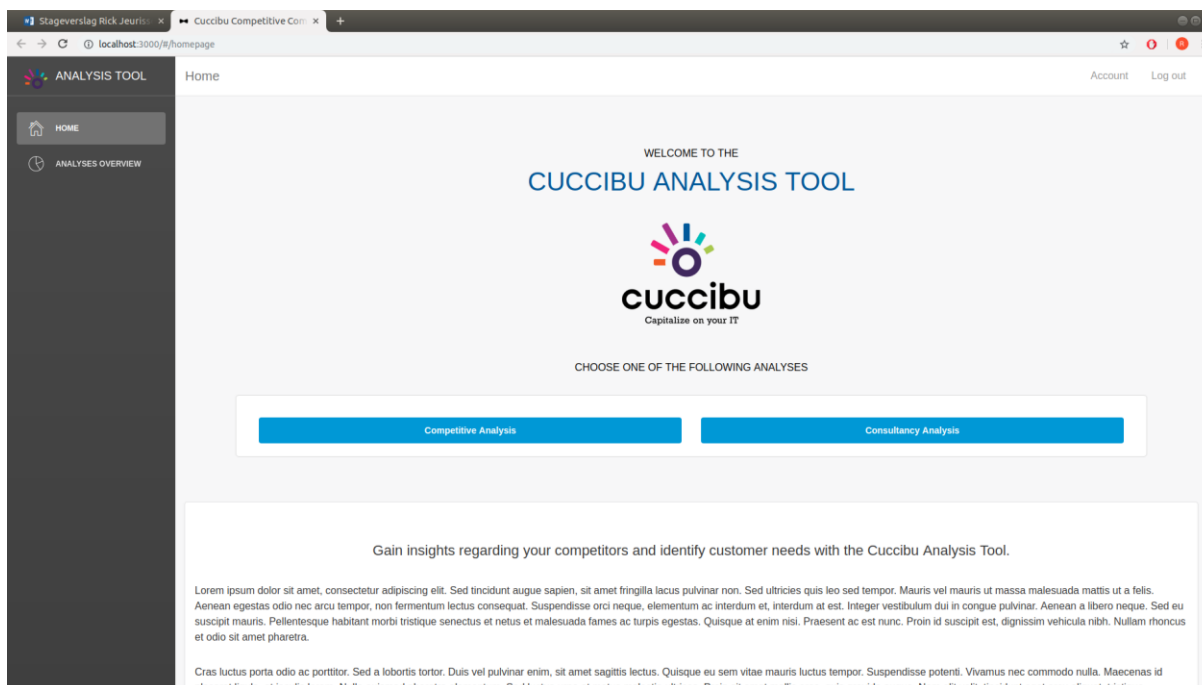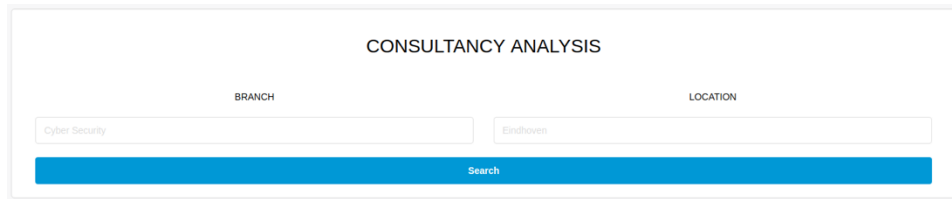
When a user clicks on 'Competitive Analysis', the following fields appear:
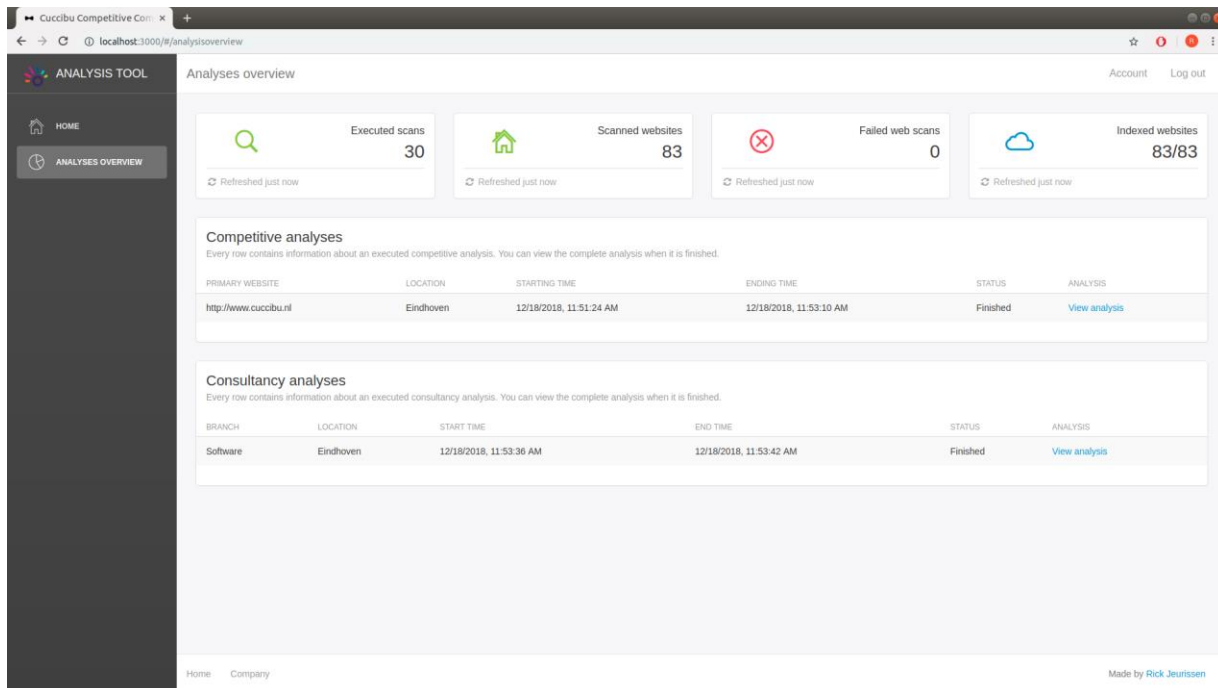


Otherwise, a user can click on 'Consultancy Analysis'. The following entry fields will appear:



An analysis can be performed by filling in the fields and clicking on 'Search'.

Performed analyzes can be viewed in the 'Analysis overview' screen, which can be navigated by clicking 'Analysis overview' in the left menu. This screen looks like this:



The top row of blocks represent statistics for a user and provide insight into how many scans have been performed, how many individual websites have been scanned, how many scans have gone wrong and how many of the individual scanned websites have been indexed.

**Competitive**                                                                                                              **Analysis**
The block entitled 'Competitive Analysis' contains all competitive analyzes including data

about the analysis itself. The block entitled 'Consultancy analysis' contains all consultancy analyses, including data about the analysis itself. If a user clicks on 'View analysis' of a competitor analysis, the following screen appears:
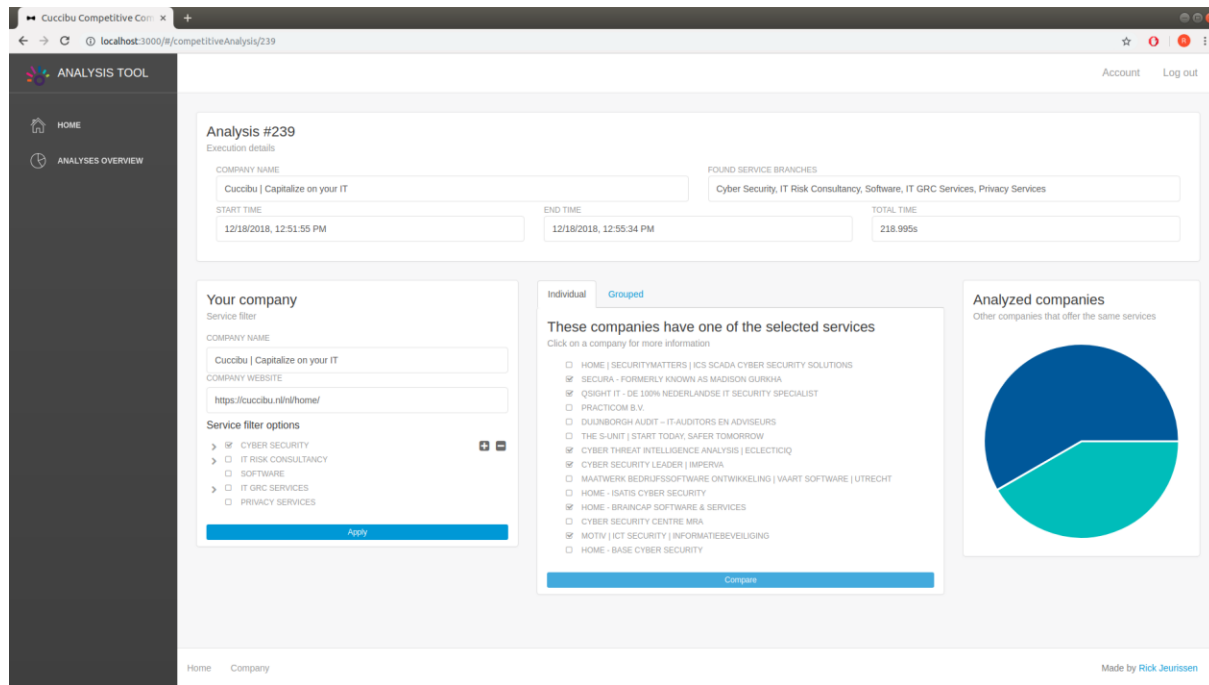


This is the analysis screen for displaying an analysis. The upper block provides the user with information about the analysis performed. The left block below provides the user with an option to filter on the companies found. The middle block contains a list of selectable companies that can be compared to the primary company. After a few companies have been selected, the user can click on 'Compare'. the next screen appears:

The upper block is provided with information related to the primary company. There is also a representation of all services provided by the primary company. The bottom block is a view of services by selected company whose services do not match the primary company's services. The tables are shown in full in the figure below.



**Consultancy**             **Analysis**

If you click on 'View analysis' in the 'Analysis overview' screen on a consultancy analysis, the following screen will be displayed:[OBJ]

The upper block provides the user with information about the analysis performed. The blocks below are potential partners. These blocks include the company name, what services they offer, the email addresses found, a link to the company website and a checkbox for adding the company to the mailing list. After selecting a number of companies, you can click on 'Prepare email'. This action displays the following screen:



The top block contains the mailing list that has been compiled from the selected companies in the previous screen. In the block below is an email template with text in which a

request for a quote. By pressing 'Send' this email will be sent to all emails in the send list.

## 4.3. Back end

The backend was set up using Spring Initializr and Maven. Spring Initializr is used to create a launch project with the correct Spring Boot Framework settings. Spring Boot Framework is a project built on top of Spring Framework and provides developers with a simpler and faster way to set up, configure and run simple web-based applications. Spring Framework is an open source framework developed to handle the complexities of enterprise application development. Using Spring Boot Framework also reduces development, unit testing, and integration testing time compared to the existing Spring Framework.

Maven is a powerful project management tool based on Project Object Model (POM). It is used for building projects, downloading and properly using dependencies and documentation.

### 4.3.1. Dependencies

The POM for the backend has the following dependencies with corresponding description:

| artifact | Name | Description |
| --- | --- | --- |
| Spring-boot-starter-data-jpa | Spring Data JPA | This one dependency is becoming used to store and retrieve data from a relational database. |
| Mssql-jdbc | Microsoft JDBC Driver for SQL Server | This one dependency is becoming used to make a database connection between backend and database. |
| Spring boot starter test | Spring Boot Test Starter | This one dependency is becoming used for testing Spring Boot applications that contain tests (JUnit). |
| jsoup | Java HTML Parser | This one dependency is becoming used to retrieve and easily manipulate HTML pages using DOM, CSS, and jquery-like methods. |
| mail | Java Mail API | This one dependency is becoming used for sending an email. |
| Spring-boot-starter-web | Spring Boot Web Starter | This one dependency is becoming used for launching (RESTful) web applications using Spring MVC. Embedded as standard |

| | | container (web server) Tomcat is used. |
|---|---|---|
| Jackson data bind | Jackson Databind | This one dependency is becoming used for parsing Java objects to JSON objects. |
| Spring boot maven plugin | SpringBoot Maven Plugin | This one dependency is becoming used for Spring Boot support with Maven. |

## 4.3.2. Models

The class diagram for the models is shown in the image below:
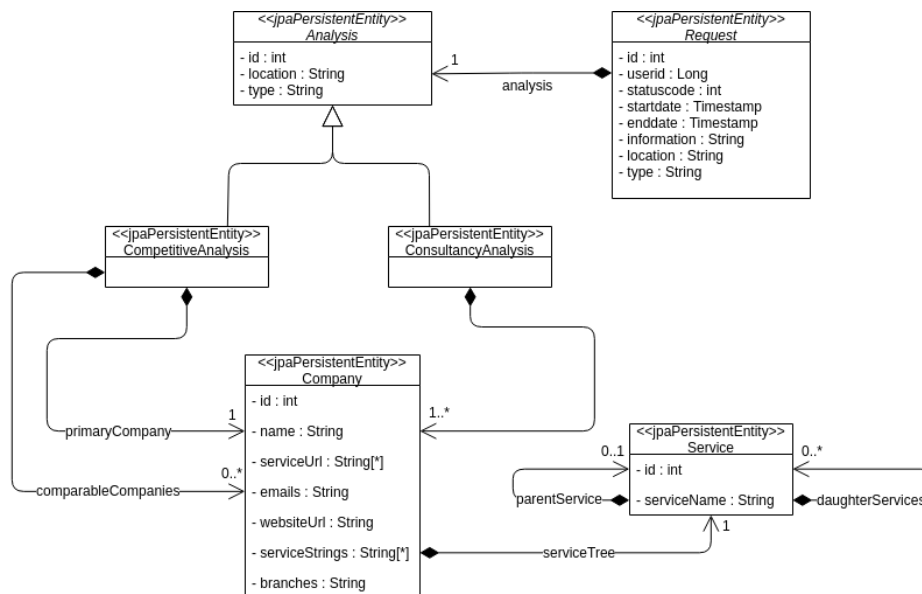


All models are provided with a JPA Entity annotation. This means that these models are used to store information in the database. The Request class has information about an analysis that has been performed. The Request class has a relationship with the abstract Analysis class. The CompetiveAnalysis and ConsultancyAnalysis classes both descend from the Analysis class.

The CompetitiveAnalysis class has two relationships with the Company class. The CompetitiveAnalysis class has a relationship with Company called primaryCompany. This Company class contains scanned company information which is used for a comparison with potential competitors. The CompetitiveAnalysis class has another relationship with the Company class called comparableCompanies. This is a list of Company objects that offer similar services to the primaryCompany.

The ConsultancyAnalysis class has a relationship with the Company class called potentialPartners. This is a list of Company objects with potential partners that can eventually be contacted by sending an email.

Each Company class has a relationship with the ServiceNode class called serviceTree. Each ServiceNode has a serviceName and a relationship to itself. This relationship is called parentServiceNode. Each ServiceNode also has zero or more daughterServices.

## 4.3.3. Components

The component diagram is constructed as follows:
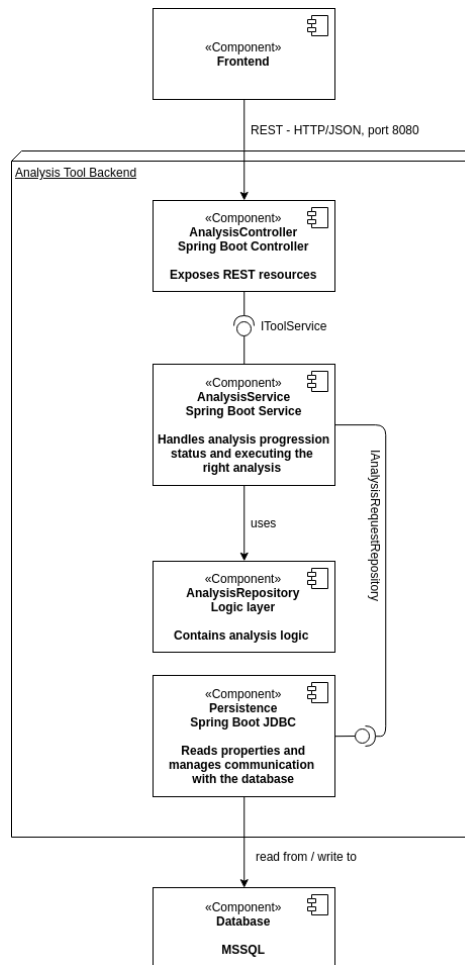


*Component: Frontend*

This component is explained in the subchapter 'Frontend'.

*component:* *AnalysisController*

This component is the central call point for the frontend and features a rest controller. This component uses the IToolService implementation of the AnalysisService component. In this rest controller a number of call points have been added that can be used by the frontend. The call points are listed in the table below with associated information about the functionality.

| Name | Callpoint | parameters | Functionality |
|---|---|---|---|
| startConsultancyAnalysis | http://localhost:8080/api/analysis/ startConsultationAnalysis | branches, location | Launch one consulting analysis with associated parameters |

| startCompetitiveAnalysis | Http://localhost:8080/api/analysis/ startCompetitiveAnalysis | Company name, location | Launch one competitive analysis with associated parameters |
|---|---|---|---|
| sendEmails | http://localhost:8080/api/analysis/sendEmails | Subject, from, emails, content | Sends emails to a distribution list through associated parameters |
| loadAnalysisRequest | http://localhost:8080/api/analysis/loadAnalysis | userId | Gets all AnalysisRequests on that of a user to belong. |
| loadStatistics | http://localhost:8080/api/analysis/loadStatistics | N/A | Gets backend server statistics on. This one statistics contain information about how many scans performed there are, how much separate websites there have been scanned, how many scans have failed and how much websites there indexed to be. |

*component:*          *AnalysisService*

This component implements the IToolService interface and ensures that the obtained analysis request from the frontend is correctly interpreted and executed. This component uses the AnalysisRepository and is also referred to as the 'logic layer'. This component also uses a CRUD-Repository that can send the progress of an analysis to the database. This way the frontend can retrieve the progress of an analysis and display it to the user.

This component contains the logic code for performing both a competitive analysis and a consultancy analysis. The workflow of these analyzes are described below.

**To carry out** **analysis**

With regard to competitive analysis, the application prompts the user for a primary website and a location. To perform a consultancy analysis, the application asks the user for an industry and a location. Analyzing websites is largely the same for both analyses. The application first scans the primary website for a competitive analysis. On the basis of this website, all services are obtained and converted into an object so that it can be used as comparison material. The application uses a list of websites to search for potential competitors. The same service scan is performed for obtaining the services of the potential competitors provided these websites have similarities with the primary website.

The frontend calculates and visualizes the conclusion of the analysis so that the backend server is not unnecessarily burdened. With regard to conducting a consultancy analysis, much the same thing happens. The user pre-specifies an industry name and city instead of a company website. With regard to entering the locations for both analyses, they are ready for expansion to outsourcing the automatic acquisition of websites by a third party. More information about this can be found in the chapter 'Website Pool Spending'.

An analysis can take a long time. An analysis time is considerably reduced by checking from the start whether an analysis has already taken place with the chosen website. If this is not the case, then the entire website is scanned and means that every page on the website is retrieved. To begin with, the main page's html code is fetched using a Java library called jsoup. The obtained html code is readable and is used to search for links that refer to other pages on the website. This is a recursive process. An analysis can take a long time with extensive websites. To achieve the non-functional requirements, a limit of depth has been set.

After all links from a website have been retrieved, service terms are searched for. The search for service terms is realized by using a hierarchical term structure. The image below shows a text file that makes this term structure readable and adaptable for a programmer:

```
1    root
2        Cyber Security#Security#Beveiliging#Netwerk beveiliging#Netwerkbeveiliging#Cyber
3            Vulnerability Assessment
4                Red Teaming
5                Security Testing
6                    Penetration Testing#Vulnerability Testing#Vulnerability and Penetration Te
7                        Vulnerability
8                Security Scan#Beveiligingsonderzoek
9                    Security Maturity
10                   Security Awareness
11                       Training#Trainingen
12                   Security Architectuur
13                   Security Team
14                   Incident Readiness
15                   Security Quick Scan
16                   Security Testing Service
17                   Infra Scan
18                   Wifi Scan
19                   Threat intelligence#Thread intelligence
20                   Intelligent Detection & Response
21                   Forensisch onderzoek#Forensic research#Forensisch#Forensic
22                   Threat detection and prevention
23                   Malware CompetitiveAnalysis
24                   Threat Indicator Sharing
25                   Web Security
26                   Application Security
27                   Intrusion Detection & Prevention#Intrusion Detection#Intrusion Prevention#
28                   Security Operating Platform
29                   Attack Analytics#Attack CompetitiveAnalysis
30                   Vulnerability Discovery
31                   Reputation Intelligence
32               Defensive
33                   Security Monitoring
```

Each term of the text file is converted into a ServiceNode in the code. A ServiceNode is a Java class that has a name, a parentServiceNode and daughterServiceNodes as attributes. To use the term structure in the code, the information in this text file must be converted to an object-oriented format and is achieved in the following way: The term on the first line is converted to a ServiceNode. This means that a ServiceNode object is instantiated with the service name 'root' and as daughterServiceNodes a list of ServiceNodes representing the nodes that fall under it. The list of daughterServiceNodes of the root ServiceNode object is then filled with a ServiceNode object with the service name 'Cyber   Security'. This ServiceNode object with service name ' Cyber   Security' also has daughterServiceNodes, namely a single ServiceNode object with the service name 'Vulnerability Assessment'. Each tab in the text file represents a deeper level. This is a recursive process and is built flexibly. This is a good solution because it uses a data set that is easy to read and edit. After the conversion, the complete root ServiceNode object looks like this in real time:

The terms behind 'Cyber   Security' are synonyms and are distinguished with the '#' sign. The ServiceNode object can now be used in code for both indicating whether a term in an HTML page is actually a service, and displaying a service tree in the frontend:



The analysis now has a Company object filled with information obtained from the primary website. This Company object now also has a ServiceNode with matching terms to the original ServiceNode of the text file and the found services of the website.

The entered website has now been analysed. The website has been scanned, a ServiceNode tree has been generated and stored in the database so that this scan does not have to be performed again. The scanned website can now be used to make a comparison with other Company objects. To find potential competitors, websites must be available. During the development of the application, a text file containing websites was used. This text file looks like this:

The contents of the websites in the text file can have all types of services. It is important that the services in the term hierarchy are extensive enough to have similarities with the websites in the text file.

In the final comparison screen of a competitive analysis, the services of the found Company objects are compared with the services of the primary Company object. Each column represents a potential competitor along with the services that the primary Company object does not have. The comparison screen is shown again in the image below:



## 4.4 Website Pool Outsourcing

Retrieving the list of websites is currently implemented through a text file. This section is programmed to be easily expandable for third party outsourcing. Appendix II contains information about potential services, along with a guide on how to use this service and what the costs are.

## 5. Conclusion and recommendation

The delivered application offers a solution for the main question posed. The Cuccibu Analysis Tool collects information from company websites and uses it for comparison. After performing the analysis, the user can choose which companies should be compared. The comparison screen is presented to the user with a single button press. In addition to implementing the solution, expansion of the application has also been taken into account. To demonstrate this, the consultancy analysis has been added.

The KANBAN development method has made a major contribution to the structured working towards the end product. If I had to carry out another assignment in the future, I would use the same methodology, because KANBAN is simple to use in all aspects and productivity is not at the expense of strict adherence to this methodology.

The outsourcing of obtaining website links is prepared as well as possible in the code. For example, the developer who wants to use the Google APIs to get the website links can immediately start the implementation for providing the links instead of having to make preparations first because it is not well structured. Annex II contains information on implementation and costs.

**From**                 **intern**             nasty             **employee**

I gave several presentations regarding the internship assignment for all colleagues. Everyone received this very positively and also provided useful feedback. Towards the end of my internship, I was asked if I wanted to start working on another application as a part-time job. Of course I really liked this and I am now working at Cuccibu as a Product Developer.

**Future**

This Proof of Concept can be expanded by strengthening the execution of the assignment against the main question. Add functionality that makes competitive analysis even easier by guiding the user through a step-by-step plan. After completing this step-by-step plan, a document is generated that expresses a competitive analysis as well as possible.

Another possibility for expanding the application is the implementation of machine learning for recognizing services on a website. Now it is only checked whether a term on a website corresponds to a term from the service term list. Training a model with machine learning would greatly improve the application and could be the tilting motion that will allow it to be brought to market. Other than the research needed to flesh out this idea, it's easy to implement the way the code is structured.

**Recommendations**

During the development of the application, a list of potential ideas was kept. These ideas are shown in the table below with an accompanying description:

| Item | Description |
|---|---|
| Outsourcing website pool | Implementation from the request from company websites based on the entered own website and location. |

| | |
|---|---|
| Make scan intensity adjustable | The website scanner continues to search for links up to a certain level. The deeper this level is set, the more services are found. However, this increases the analysis time. |
| Login system | Implementation of a secure login system. The user receives a login token. This token is therefore used for communication between the frontend and backend. If the data that is sent is also encrypted, the system is reasonably safe. |
| Automatically refresh analyzes overview | Provide a timer for making a request to the backend. |
| Notifications | Implementation of notifications that let a user know when the current state of an analysis has changed. |
| Improve service term list | The service term list can always be improved and expanded. |
| Expand testing | Extend Spring Boot's automatable tests |

## Evaluation

I think my internship period went smoothly. The way of working has had a positive impact on the realization of the project. Before I started the project I had little knowledge of the JavaScript programming language and the Spring Boot and ReactJS frameworks. The ReactJS framework works with JavaScript and now understand the fundamentals of both the framework and JavaScript. I think this knowledge is very important for a Software Engineer, because it's always good to broaden your knowledge! I now find the backend framework Spring Boot very handy to use. It is easy to set up and expand functionality.

The most enjoyable part of my internship period was programming the web crawler and the recursive service term structure. These are subjects that were a challenge at the beginning of the internship and afterwards it turned out not too bad as long as enough time is put into it. I also enjoyed programming the frontend myself. As a Software Engineer you can outsource certain activities, but I wanted to do this myself.

I unexpectedly ran into a good learning point. The analyzes that are performed request pages from web servers fairly intensively. As a test website I mainly used the Cuccibu website. By testing at least 20 times a day, it has caused Cuccibu's public IP address to be blacklisted by the hosting company of the Cuccibu website. This means that all employees in the building could no longer visit the website. Fortunately, to prevent this in the future, this was quickly resolved by running the scanned websites once and then saving them in a database. This problem has made me aware of the importance of thinking carefully about the consequences of your actions.

The least enjoyable part of my internship period was writing the unit tests and the internship report. This does not detract from the fact that these activities are important to carry out. If I take unit tests into account while programming, I subconsciously write the code better. Applying this to all methods in the project keeps the code clean and readable. While processing the internship report, I noticed how difficult it can be to write your work readable for all target groups. By having different people read the report, this got better and better.

What I would still like to learn is how machine learning can actually be implemented in this project. I find this topic very interesting and would like to learn more about it in my minor semester next year. Maybe I can continue with this in my graduation internship?

My impression of the corporate culture is very pleasant. I have the feeling that there are few comparable companies that place as much value on a corporate culture as at Cuccibu. I can literally put my questions to every colleague and I also have the feeling that everyone is listening. I describe my overall experience at Cuccibu as a professional company with a professional working environment. During my internship, the interns were also invited to company outings and monthly meetings. This added a lot to getting to know all colleagues. I think this is a top internship company!

## Literature list

- Jump boot Initializr O[https://start.spring.io/](https://start.spring.io/)

  Consulted for easy setup of a Spring Boot project.

- Jump boot tutorial
  - o [https://spring.io/guides/gs/spring-boot/](https://spring.io/guides/gs/spring-boot/) [https://www.tutorialspoint.com/](https://www.tutorialspoint.com/)
    - o [spring_boot/spring_boot_bootstrapping.htm](https://www.javatpoint.com/spring-boot-tutorial) [https://www.javatpoint.com/spring-](https://www.javatpoint.com/spring-boot-tutorial)
    - o [boot-tutorial](https://www.javatpoint.com/spring-boot-tutorial)

  Consulted for gaining knowledge regarding the framework for implementing the backend.

- JavaScript Tutorials
  - o [https://www.w3schools.com/js/](https://www.w3schools.com/js/)
  - o [https://javascript.info/](https://javascript.info/)

  Consulted for getting knowledge related to JavaScript as a prerequisite for ReactJS.

- ReactJS Tutorials
  - o [https://reactjs.org/tutorial/tutorial.html](https://reactjs.org/tutorial/tutorial.html)
  - o [https://www.tutorialspoint.com/reactjs/](https://www.tutorialspoint.com/reactjs/)
  - o [https://appdividend.com/category/react-js/](https://appdividend.com/category/react-js/)

  Consulted for gaining knowledge related to ReactJS for implementing the frontend.

- Web crawler
  O[http://www.netinstructions.com/how-to-make-a-simple-web-crawler-in-java/](http://www.netinstructions.com/how-to-make-a-simple-web-crawler-in-java/)

  Consulted to gain knowledge on how to create a Web crawler to perform an analysis.

- Java recursion
  - o [https://www.programiz.com/java-programming/recursion](https://www.programiz.com/java-programming/recursion)
  - o [https://www.baeldung.com/java-recursion](https://www.baeldung.com/java-recursion)

  Consulted for gaining knowledge related to creating the recursive service term structure

- DrawIO
  O[https://www.draw.io/](https://www.draw.io/)

  Referenced for drawing the class diagrams and component diagrams.

- competitive intelligence
  O[https://en.wikipedia.org/wiki/Competitive_intelligence](https://en.wikipedia.org/wiki/Competitive_intelligence)

Consulted for gathering knowledge related to CI

## I. Project Initiation Document

### 1. The company



Cuccibu was founded in 2014 by two IT professionals. From their work for an accountancy firm, they saw a growing need for support in the field of IT Audit & IT Risk Management. Cuccibu is also specialized in Information Security and Cyber  Security. The company has a team of enthusiastic and experienced experts in the field of IT, audit and Risk and are ready to assist with IT Risk issues. By creating insight into the risks for an organization, Cuccibu helps the organization to be in control and to convert risks into opportunities and added value.

## Competitors

The company has a wide range in different markets. There are companies that, for example, have the same activities in Information Security or Cyber  Security, but do not carry out legal activities. Cuccibu does, but perhaps a customer is not looking for that at all and is already satisfied with what a self-employed person can do. It's just what a customer asks for.

## 2. The command

## 2.1 Job description

### Original command

Cuccibu has data available that is not used much yet. This data can add value to the company. What is the data that is used is still the question. An application will be built that retrieves, structures and then stores this data in a database. This format should be conveniently designed so that it can be easily used for visualization. Subsequently, a Web application must be created that can visualize this data in an insightful way. So what will be visualized is still unknown.

### Prevent double work

The application(s) that will be realized in this assignment are reasonably similar to software that already exists. The producers of this software are well-funded and this raises the question of whether I want to realize these applications myself again at all. Power BI from Microsoft can be used to visualize an existing dataset. Power BI is an interactive tool for visualizing data. The purpose of this software is to make business intelligence available to the end user. What work then remains for me is parsing the data that can then be offered in Power BI. This is doable, but I don't think this is enough to demonstrate my Software Engineering competencies. I wonder how to proceed with this.

After discussing it with a colleague, a few ideas came up. A colleague came up with the term Competitive Intelligence. Companies mainly focus on Business Intelligence and Organizational Intelligence. This is often internally focused and ensures that external data from competitors, for example, is not looked at. Competitive Intelligence is a process that makes the company more competitive.
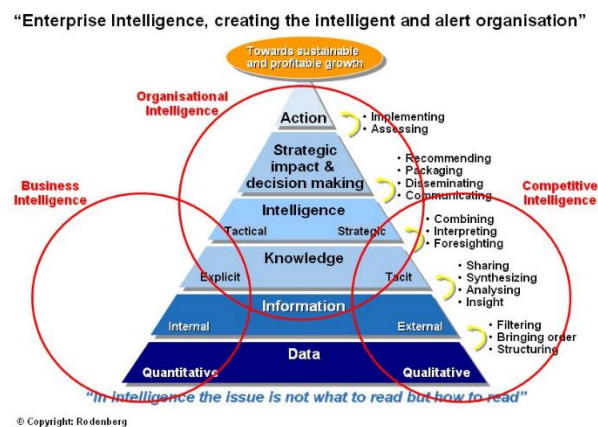


### competitive intelligence

By researching competitors and industry trends, Competitive Intelligence can add to the company's success. Competitive Intelligence is the action of defining, collecting and analyzing information about products, customers, competitors and all aspects of the environment necessary to support executives and managers in taking strategic

decisions for a company. Much of this type of business information can be retrieved from the Internet, for example through publish reports, financial statements, websites and articles. This is called secondary research. This information can be obtained indirectly through search engines (Google). Primary research is obtaining this information directly through conversations with industry experts, competitors, vendors and customers. The advantage of primary research is that it provides the most accurate and up-to-date information on how the competitive landscape works. The disadvantage here is that usually an intermediary sells the information. The information obtained is finally analysed. The result of this process is called Competitive Intelligence.

## New assignment

Information on the internet can therefore have business value for Cuccibu. Software can be realized for this. The assignment will consist of writing software that traces competitors based on a company name. From the resulting company names, the following things are searched on the Internet:

- O   Products – What does the company
- O   offer? Prices – What prices are asked?
- O   Promoting – What activities do they carry out for promoting their products? Location
- O   – Where do they sell the products?
- O   Customers – Which customers do they have?
- O   Other – What is their sales force structure? What are their technical problems? etc

By storing the right information in a structured way, it is possible to map this out visually. With all this information, a Web application can be made that nicely maps Cuccibu's competitors, what they do, what prices are asked, what activities they carry out to promote their products, which customers they have and where they sell the products.

## 2.2 Purpose of the assignment

The aim of this product is to make the company aware of the competitive landscape it is in. This has business value because competitors may have more sales because they promote their products in a different way, sell products in a better location or simply charge better prices for selling their products. By bringing various items of competition into an insightful overview and comparing them with the company itself, useful conclusions can undoubtedly be drawn through the use of this software.

## 2.3 Analysis of the assignment

Main question

*"How can a company use external data in a beneficial way so that the company knows what it is for markets it can strengthen?"*

Above is the main question that was asked for the assignment. The internet is full of information about people, companies, products, problems, etc. This information always has a link somewhere to where it came from.

Because there is so much information available, you have to respond innovatively simply because another person will work with it differently. If a company were to use this software, the company would have a clear overview of what the competitor is doing. From this information, the company can draw conclusions in which it can still improve.

### Challenge
The challenge of this assignment is to research how I can find as much information as possible about a company using only a company name. When this problem is solved I can start building the lookup components. Another challenge is the ultimate display and updating of the collected information.

### Cause
This assignment originated from an innovative perspective. Developing ideas without knowing whether a market really needs it is often a gamble. It was precisely this aspect that really appealed to us to carry out the assignment.

## 2.4 Activities (scope)
I'm going to develop software that maps the competitive landscape of a company. What the software is not going to collect is...

### Risks
There is still a lot of research to be done on various subjects before it can be indicated what the risks are for the assignment. In the worst case, I can't manage to deliver the final product on time as I want. As a result, requirements have been set for the assignment in consultation with the client.

### 2.5 Requirements for the assignment
### Functional requirements

| ID | Urgency | Description |
|----|---------|-------------|
| R1 | MUST | Enter company name on a web page |
| R2 | MUST | Find similar companies |
| R3 | MUST | Looking up competitive information from another company |
| R4 | MUST | Compare your own company with the competing companies |
| R5 | MUST | Present conclusion on web page |
| R6 | COULD | login |
| R7 | COULD | Saving data |

## Non-functional requirements

| ID | Category ISO 25010 | Description |
| --- | --- | --- |
| NR1 | Performance | The web application has a response time of up to 1 second |
| NR2 | Performance | The competitive analysis process takes no longer than 1 minute. |
| NR3 | maintainability | The system is modular. |
| NR4 | maintainability | The code is written according to a recognized encryption standard. |
| NR5 | maintainability | At least 75% of the code is tested using unit tests |
| NR6 | Usability | The design of the web application must be user-friendly so that the user does not have any questions about using the application |

## Method

The Agile framework SCRUM is used to develop the software. This framework was chosen because sudden changes are expected. There are also a number of tasks for which it is not yet certain how they should be tackled. Working this way will keep productivity high. By using SCRUM, items can easily be added or removed.

## Research strategies

The research strategy that will be used is "Lab". I want to use this research strategy because it suits the way the project is progressing. Using SCRUM there are a number of iterations. I expect new questions or opportunities to surface with each new iteration. We work towards the end product step by step, which is why I think this is a good research strategy. The research is about automating the search for company information. If I know how to obtain the right information from a company in the right places, I can start setting up a test environment in which I set up a test application that can test this.

## Activity description

To begin with, the front-end server is set up. In the beginning, this web server will only serve to pass on a company name. Once this has been set up, the next step is to start the sub-application that searches for comparable companies. This sharing application is called "**Comparable Company Searcher**". This sub-application returns a list of the names of similar companies. These names are passed on to the sub-application "**Company Analyzer**". This sub-application looks for information about the provided company names. The information about each analyzed company is passed on to the next sub-application called "**Company Information Comparer**". This sub-application compares the information found with its own company information and passes a composite conclusion to the web server in presentation format. If a user enters a company name on the web page after implementation, this results in an overview that shows the competitors of the entered company name in maps, what they do, what prices are asked, what activities they carry out to promote their products, which customers they have and where they sell the products. described in the non-functional requirements.

## 4. Scheduling

### Concurrentieanalyse en visualisatie applicatie
Cucabu BV

| | Project Start Date | 8-27-2018 (maandag) | | Display Week | 1 |
|---|---|---|---|---|---|
| | Project Lead | Rick Jeurissen | | | |

| WBS | TASK | LEAD | START | END | DAYS | % DONE | WORK DAYS |
|---|---|---|---|---|---|---|---|
| | eindproduct | | | | | | |
| 1.7 | Laatste stage week | | ma 1-14-19 | zo 1-20-19 | 7 | 0% | 5 |
| 2 | Project | | - | | - | | - |
| 2.1 | Maken PP. | | ma 8-27-18 | zo 9-09-18 | 14 | 50% | 10 |
| 2.2 | Webapplicatie opzetten met input mogelijkheden voor bedrijfsnaam (front-end server) | | ma 9-10-18 | zo 9-16-18 | 7 | 0% | 5 |
| 2.3 | Back-end server opzetten | | ma 9-17-18 | zo 9-23-18 | 7 | 0% | 5 |
| 2.4 | Onderzoek naar geautomatiseerd zoeken op het internet | | ma 9-24-18 | zo 10-07-18 | 14 | 0% | 10 |
| 2.5 | Architectuur document maken. Modellen bedenken en opzetten. | | ma 10-08-18 | zo 10-14-18 | 7 | 0% | 5 |
| 2.6 | Component 1: Vergelijkbare bedrijven opzoeken | | ma 10-15-18 | zo 11-04-18 | 21 | 0% | 15 |
| 2.7 | Component 2: Concurrerende informatie van bedrijf opzoeken | | ma 11-05-18 | zo 11-25-18 | 21 | 0% | 15 |
| 2.8 | Component 3: Eigen bedrijf vergelijken met de concurrerende | | ma 11-26-18 | zo 12-09-18 | 14 | 0% | 10 |

### Concurrentieanalyse en visualisatie applicatie
Cucabu BV

| | Project Start Date | 8-27-2018 (maandag) | | Display Week | 1 |
|---|---|---|---|---|---|
| | Project Lead | Rick Jeurissen | | | |

| WBS | TASK | LEAD | START | END | DAYS | % DONE | WORK DAYS |
|---|---|---|---|---|---|---|---|
| 2.5 | Architectuur document maken. Modellen bedenken en opzetten. | | ma 10-08-18 | zo 10-14-18 | 7 | 0% | 5 |
| 2.6 | Component 1: Vergelijkbare bedrijven opzoeken | | ma 10-15-18 | zo 11-04-18 | 21 | 0% | 15 |
| 2.7 | Component 2: Concurrerende informatie van bedrijf opzoeken | | ma 11-05-18 | zo 11-25-18 | 21 | 0% | 15 |
| 2.8 | Component 3: Eigen bedrijf vergelijken met de concurrerende bedrijven | | ma 11-26-18 | zo 12-09-18 | 14 | 0% | 10 |
| 2.9 | Component 4:Conclusie presenteren op webpagina | | ma 12-10-18 | zo 12-23-18 | 14 | 0% | 10 |
| 2.10 | Afronden product en start voorbereiding oplevering | | ma 12-24-18 | zo 12-30-18 | 7 | 0% | 5 |

## 5. Agreements regarding communication

## Supervisor

### Name
Function
### phone number
Company supervisor email address

### Fontys teacher
### Name
Function
### phone number
E-mail address

### Frequency and target

My internship supervisor will make time at least twice a week to supervise me, of which one of the two times will be at least face to face. We will then talk about what I'm working on, what I'm going to work on that week and what I'm running into. I think of this as the weekly standup.

## II. Website pool outsourcing

Cuccibu Analysis Tool website pool outsourcing

To realize user-friendliness in the tool, I would like to outsource the search for company websites to parties that provide information about companies based on location and parameters. In this document I describe which service it eventually became, what costs this entails and what other services I have investigated.

### Google API

Google APIs is a set of APIs (application programming interfaces) developed by Google that allow communication with Google Services and integration with other services. Examples include Search, Gmail, Translate or Google Maps. Third-party apps can use these APIs to leverage or extend the functionality of the existing services. The APIs provide functionality such as analytics, machine learning as a service (the Prediction API), or access to user data (when permission to read the data is given). Another important example is an embedded Google map on a website, which can be reached using the Static maps API, Places API or Google Earth API.

#### What kind of services does Google Maps offer that can strengthen the tool?

The functions in the Places Library API allow applications to search for places (defined in this API as branches , geographic locations, or prominent points of interest) in a specific area, such as the boundaries of a map or around a fixed point. What really helps the tool is the information it retrieves from a company. This library allows a developer to perform the following actions:

- O Find Place from Query returns a place based on a text query (for example, the name or address of a place).
- O Find Place from Phone Number returns a place based on a phone number. Nearby
- O Search returns a list of nearby places based on a user's location.

- O Text Search returns a list of nearby places based on a search string, for example. "Pizza".
- O Location details request returns more detailed information about a specific place, including user reviews.

The Nearby Search allows a user to query nearby places. The following parameters should be used to retrieve useful information for the tool:

- O A location (x and y) with a radius
- O Keyword (e.g. Cyber   Security, Privacy Services etc) (or name?)

An array of PlaceResult objects is returned as a result. A PlaceResult object contains the following properties:

- O Location
- O Icon
- O Name

45

O Place_id

With the Place Details extensive information can be retrieved from the place_id of a company. The developer must also indicate what exactly needs to be requested because certain fields entail different costs.

The following fields are divided into three price categories:

- O   Basic
- O   Address_component, adr_address, alt_id, formatted_address, geometry, icon, id, name, permanently_closed, photo, place_id, plus_code, scope, type, url, utc_offset, vicinity
- O
- O   Formatted_phone_number, international_phone_number, opening_hours, website
- O   Atmosphere
- O   Price_level, rating, review

The fields that apply to the analysis tool:

- O   Basic
- O   Address_components, formatted_address, icon, name, vicinity
- O   Contact
- O   Website, formatted_phone_number

### Cost

When adding a credit card, the billing account gets $200 free monthly credit. This means that the tool can make up to 10,000 calls per month from this freely obtained money. When this credit is used up, a fee of $20 per 1000 requests will be charged. It is important that a developer is always aware of these costs. For more information about the costs see: https://cloud.google.com/maps-platform/pricing/sheet/?hl=nl

For each analysis, depending on how many services the website has (which a user entered at the start of the analysis), a Nearby Places call is made. Various place_ids can be obtained from this. A Place Details call is made per place_id. The more services a website contains, the more calls have to be made.

#### Conclusion

It seems that Google is providing the services that the tool needs. However, I was not able to make a demo because I can only use the services after creating a validated billing account that must have a credit card associated with it. After approval, this can be implemented in the tool.


### Other Potential Services

#### Foursquare

Foursquare is one social networking site , software in front of mobile phone and a game. Users 'check in' on places (*venues*) via a mobile website, text message or through special applications for mobile phones. This earns them points (*points*) and sometimes *badges*. The service was created by Dennis Crowley and

[Naveen Selvadurai](#) ; Crowley previously conceived the similar project[Dodgeball](#) , what in[2005](#) was taken over by[Google](#) and finally in[2009](#) ended up.

What kind of services does Foursquare offer that can strengthen the tool?

Using their applications, they collect information about Point of Interests. This information contains information about potential companies that the tool can use for the analysis. The company makes this information available to developers and is free for small-scale use. Developers get, with the free version, the possibility to make the following requests:

- o   950 regular requests per day 50
- o   premium requests per day 1
- o   photo per Point of Interest 1 Tip
- o   per Point of Interest

After creating a free account, I put together a request that I can implement in the tool.

Site url:

   o[https://foursquare.com/developers/explore](https://foursquare.com/developers/explore)

The endpoint I used:

   o[https://api.foursquare.com/v2/venues/search](https://api.foursquare.com/v2/venues/search)

The parameters I used:

| Parameter | Value |
| --- | --- |
| near | Eindhoven |
| query | CyberSecurity |
| radius | 50000 |
| Client_id | BAQEBLV32XXIXZ5BNL0Q33D5YGC5U5RICO04ITB PUTZMBKVP |
| Client_secret | CBP1GSZNV35RSO2K2VVZPTFP552QJU2TIDWUIS VSB35BN3JQ |
| v | 20181105 |

Result and conclusion

## Result obtained when requesting venues with the parameters used:

"venues": [

   {

     "id": "4ebbc0946c25b8c5fa1d3897",

```
  "name": "New Bosch Security Systems Office",

  "location": {

   "lat": 51.44617362793517,

   "lng": 5.457867242939324,

   "labeledLatLngs": [

     {

       "label": "display",

       "lat": 51.44617362793517,

       "lng": 5.457867242939324

     }

   ],

   "cc": "NL",

   "city": "Eindhoven",

   "state": "North Brabant",

   "country": "Netherlands",

   "formattedAddress": [

     "Eindhoven",

     "Netherlands"

   ]

  },

  "categories": [

   {

       "id": "4bf58dd8d48988d124941735",

       "name": "Office",

       "pluralName": "Offices",

       "shortName": "Office",

       "icon": {

         "prefix": "https://ss3.4sqi.net/img/categories_v2/building/default_",

         "suffix": ".png"

       },

       primary: true

   }

  ],

  "referralId": "v-1541413238",

  "hasPerk": false

  },
```

The result obtained does not meet the requirements of the tool. The company website is not available. This is the case at some 'venues'. From this I conclude that this service does not provide enough information that can be used in the tool.

*Factual Global Places*

Factual is a location data company driving innovation in product development, mobile marketing and real-world analytics. Property data from Factual references more than 3 billion businesses, landmarks and other points of interest in more than 100,000 unique sources. Global Places is a service used by customers for local search engines, business analytics and mobile applications that need to understand how consumers connect to the real landscape.

Factual makes the data they have accessible to developers and analysts. The data can be used on their website. The screenshot below shows what kind of information is obtained:



### Result and conclusion

The service has a lot of information available, but it is not possible to filter on the services that the tool needs. I was able to filter on more specific terms within security (Cyber   Security) but nothing came up on the screen as a result. Apart from that, too many collected companies do not yet have website urls that, for example, Google Maps does.

## III. Test plan

### Introduction

In this document, tests are written for the requirements from the Architecture Document. This is the acceptance report for the application. This document is important to see if all M requirements are covered, this can be seen at a glance.

There is one test case for each requirement and a step-by-step plan has been formulated for each test case. Each step indicated here is also performed in the actual application. This ensures that the functional correctness of the application can be properly recorded. A score is noted for each test case:

   1. FAILED: the function is not working or not present.

2. PASSED: the function works as stated in the requirements.

The acceptance test approves the application if these criteria are signed off:

1. The test cases related to the requirements with MoSCoW criteria M have the status PASSED.

2. All test cases have been executed and are in FAILED or PASSED status.

The test cases are run on a PC running Linux.

## Requirements

| ID | Urgency | Description |
|---|---|---|
| R1 | Must | Perform competitive analysis |
| R2 | Must | Perform consultancy analysis |
| R3 | Must | View analysis overview |
| R4 | Must | View competitive analysis |
| R5 | Must | Competitive analysis perform comparison |
| R6 | Must | View consultancy analysis |
| R7 | Must | Consultancy analytics send billing request |

| ID | Urgency | Description |
|---|---|---|
| R8 | Should | Show backend statistics in dashboard |

## Test Matrix

| Requirement | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 |
|---|---|---|---|---|---|---|---|---|
| R1 | X | | | | | | | |
| R2 | | X | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **R3** | X | | | | | |
| **R4** | | X | | | | |
| **R5** | | | X | | | |
| **R6** | | | | X | | |
| **R7** | | | | | X | |
| **R8** | | | | | | X |

## Test cases

| Test case id. | Req. | Assumption | To be carried out steps | Expected result | Observed result | Result test case (Pass / Fail pass |
|---|---|---|---|---|---|---|
| **T1: Competitive Ana perform lysis** | R1 | User is up the main page. | - Click on "Competitive Analysis".<br><br>- Feed COMPANY WEBSITE: "http://www.cuccibu.nl".<br><br>- Feed LOCATION: "Eindhoven".<br><br>- Click on Search. | Text Notification: "executing analysis. your analysis can take sometime. Head over to 'Analysis overview' on the left side panel to view the progress." | Text Notification: "executing analysis. your analysis can take sometime. Head over to 'Analysis overview' on the left side panel to view the progress." | Passed |
| **T2: Consultancy anal run yse** | R2 | User is up the main page. | - Click on "Consultancy analysis"<br><br>- Feed BRANCH: "Software".<br><br>- Feed LOCATION: "Eindhoven".<br><br>- Click on "Search" | Text Notification: "executing analysis. your analysis can take sometime. Head over to 'Analysis overview' on the left side panel to view the progress." | Text Notification: "executing analysis. your analysis can take sometime. Head over to 'Analysis overview' on the left side panel to view the progress." | Passed |
| **T3: Analyzes Overview to display** | R3 | User state on the main page | - Click on "ANALYSIS OVERVIEW". the menu at the left side of the screen | The user sees now an overview of all analysis. | The user sees now an overview of all analysis. | Passed |

| T4: **Competitive Ana see lysis** | **R4** | The user has minimal a competitive anal yse executed | - Click in the first competition anal yse on "View analysis". | The user sees now the competitive anal yse. | The user sees now the competitive anal yse. | Passed |
|---|---|---|---|---|---|---|
| T5: **Competitive Ana lysis comparison** to carry out | **R5** | The user has in it analysis overview "View analysis" in a competition analysis clicked. | - Select in the left "Your company" block the filter cluster name: "CyberSecurity" <br> - Click "Apply" <br> - Select in the middle "These companies have the selected services" block the first two businesses. <br> - Click on "compare" | The user sees now an overview containing the equations. | The user sees now an overview containing the equations. | Passed |
| T6: **Consultancy anal see yse** | **R6** | The user has minimal a competitive anal yse executed | - Click on "Analysis overview" in the menu at the left side of the screen <br> - Click in the first consultancy analysis se on "View analysis" | The user now has insight in the consultancy analytics se. | The user now has insight in the consultancy analytics se. | Passed |
| T7: **Consultancy anal yse billing request send** | **R7** | The user has in it analysis overview "View analysis" in a consultancy analytics se clicked. | - Select the first two potential partners <br> - Click bottom right on "Prepare e-mail" <br> - Fill in it text field for the company name: "Township Eindhoven" <br> - Click on "Send" | There will now be one email sent nasty cuccibuanalysist ool@gmail.com | There will now be one email sent nasty cuccibuanalysist ool@gmail.com | Passed |
| T8: Backend statisticsweather | **R8** | The user is located at the main page | - Click on "Analysis overview" in the | The top four give blocks current | The top four give blocks current | Passed |

**enter**
**dashboard**

menu at the
left side of
the screen

statistics
again.

statistics
again.