Copernica profile

Copernica BV is a highly professional internet company that develops complex software. We work in a driven, professional and enterprising environment. The organization is located in a state-of-the-art office (near Amsterdam Central Station) with the latest modern workplaces. At Copernica we spend a lot of time on exchanging knowledge and educating each other. The organization is growing fast and has several international offices.

In ten years' time, Copernica has grown from a small email marketing provider to an international and successful developer of powerful marketing software. Driven by our three core values 'passionate, entrepreneurial and innovative', today we develop generic software and provide thousands of companies with a powerful solution to reach their marketing goals.

As a Software Engineer you will be working in an independent and varied position within a team of experienced developers. You will be busy with object oriented programming and devising new features and functionalities based on our own developed framework. Together with your colleagues you determine the architecture and instruct the test team. Within the organization you will get the opportunity to work with the newest technologies and apply the newest developments. The software is web based and is hosted on Copernica's in-house Linux platforms. Depending on your own capabilities and wishes, it is possible to be involved with other technical teams at Copernica.

In this document you will find only four projects. There are a lot more projects available. You can also define your own project and submit it to us.

If you are interested in a Master thesis Internship, you can send your CV and motivational letter by email to quentine.stoc@copernica.com. We will let you know if you are invited for a first interview within 48 hours.

Assignment 1: DATA MINING
Copernica manages a large amount of data. However, the meaning of a lot of information is unknown. During your internship you'll develop various methods that add semantics to Copernica's data. In some cases you'll have to deploy artificial intelligence, in other circumstances you'll simply have to offer users the possibility to specify what information should be stored in the system.

Context of the project within the organization
Having a better overview of data semantics enables Copernica to discover patterns in and links between the information in the database. This is essential for us to establish more relevant communication with existing clients and prospects, helping us to:

- Achieve a higher ROI and conversion with prospects and existing clients
- Send relevant system alerts and product information
- Offering better product support
- Improve our client retention

The problem that has to be solved
Copernica manages a large amount of data. However, the meaning of a lot of information is unknown. Certain information we need to establish relevant communications with our users may be available in the database, but is missing the semantics to use it in the most efficient way possible.

Possible research questions

- Is it possible to distill missing information from the apparently unconnected information that is available now?
- How can I map and connect available information and create an overview of the way certain information relates to each other?

Possible solutions

- Distill missing information from apparently unconnected information.
- Map and connect available information and create an overview of the way certain information relates to each other.

Examples:

- Use information like zip codes, city name, and phone numbers to find out the country a company is located in.
- Create a way to see which users were impacted by a certain server interruption by comparing the times they logged in to the software and the database server they use to send data.
- Help clients that use the software do so more efficiently by checking if they make unnecessarily complicated selections on their databases.

- Compare the available information in our different databases to see what kind of contract a certain customer has.

How the quality of the solution can be tested

- Is the previously missing information that is being distilled correct? Randomly and systematically check certain profiles manually to verify.

Assignment 2: MAIL PARSING
Copernica receives a lot of bounces and other automatic replies whenever our software is used to send emailings. Most of these messages are system notifications and are built up according to specific standards (mail delivery status, disposition notification, etcetera) and are processed automatically. This, however, does not apply to all messages.

During your internship you'll be working on a way to improve the way the software receives, reads and automatically processes bounces. Messages that are not built up according to a standard and/or consist of natural languages must be processed automatically as well. To achieve this goal you can use heuristics, natural language analysis and other techniques.

Context of the project within the organization
Being able to automatically process any kind of (automatic) replies will enable our clients to work with the software more efficiently and save them time processing these replies automatically. This helps Copernica improve the user experience of our software and enhance customer satisfaction. In the long term this will also improve our (users') send reputation.

The problem that has to be solved
Copernica is able to automatically process bounces that are built up according to specific standards (mail delivery status, disposition notification, etcetera). The software is however not yet able to do so with certain (automatic replies), like out of office notifications.

Because of this, our users have to process these replies manually, which creates two problems:

- It's time consuming for our users

- Users that neglect to handle these replies manually, eventually might damage their sender reputation, because they keep sending emails to addresses that either don't exist, or to recipients that have stated they don't want to receive their emails anymore

Possible research questions

- What keyword combinations in an automatic reply indicate that an email address is no longer active?

- What keyword combinations in a reply indicate that someone no longer wants to receive emailings?

- How can I ensure that these keywords are automatically detected and their senders removed from the mailing list?

Possible solutions

- Automatically unsubscribe users that reply using certain combinations of keywords

How the quality of the solution can be tested

- Are the right addresses being excluded from the mailing list?
    - Were the addresses that are excluded from the mailing list already on there, or are wrong addresses being processed (mailer daemons for example)?
    - Manually check the replies that were used to exclude addresses from the mailing list. Was the message sent actually any form of indication not to send emails anymore?

Assignment 3: ALTERNATIVE STORAGE SOLUTIONS

At Copernica we mainly use relational databases to store information. NoSQL however is increasingly emerging as a solution for storing large volumes of data. During your internship you will map Copernica's systems, provide solutions to bottlenecks and suggest alternatives for SQL.

Context of the project within the organization

At Copernica we would like to explore the possibilities of alternatives for the way we are currently storing information in our databases.

The problem that has to be solved

At Copernica we mainly use relational databases to store information. NoSQL however is increasingly emerging as a solution for storing large volumes of data. Therefore, we would like to explore alternatives for the way we are currently storing information in our databases.

Possible research questions

- What are the advantages of NoSQL compared to the way information is stored now?
- What are the best alternatives for SQL?
- How are Copernica's current systems built up?
- What issues might this current system build up cause?
- How can I solve these bottlenecks?

Possible solutions

- Changing the database structure
- Using alternative for SQL

How the quality of the solution can be tested
Are the alternatives for storing information better than the current way we do so? This could be measured through:

- Can the information be stored quicker?
- Is the information easier accessible?
- Do we have a better and more clear overview of the information in our database?

Assignment 4: COPERNICA ON MOBILE DEVICES
Copernica Marketing Software is only available in a full web version, and is not yet fully accessible for mobile devices. During your internship you'll develop the first prototype for a mobile version.

Context of the project within the organization
Mobile phones and tablets are accountable for 10% of the total online traffic through browsers. Forecasts predict even higher numbers for the future. For some functionalities in our software, like email statistics or send reports, accessibility through mobile devices would enable our users to monitor their emailings whenever and wherever they are. Mobile accessibility helps Copernica improve the user experience of our software and enhance customer satisfaction.

The problem that has to be solved
Our software is not yet optimally accessible for mobile devices. For some features however this would be a valuable addition.

Possible research questions

- Which features of the software should be accessible through a mobile device?
- How do I make these features accessible with a mobile device?
    - Should I create a new interface or find a way to automatically resize the current version for mobile devices?
    - Which techniques can I use and are supported by the major smartphone operating systems?

Possible solutions

Email statistics and send reports should be accessible through mobile. Also, users should be able to compose and send SMS mailings, access their database (selections) and be able to test how emailings display on a mobile device.

How the quality of the solution can be tested

- Is the prototype accessible on all major smart phone platforms?
- Is every available feature in the prototype performing as it should?
- Is mobile traffic in the test environment automatically being redirected to the prototype?