



Technical University of Cluj-Napoca
Faculty of Automation and Computer Science
Computer Science Department

Financial Efficiency Boosting System For Consumer-Grade Products

Student
Péter-Tibor ZAVACZKI

Advisor
Assoc. Prof. Dr. Eng. Delia Alexandrina MITREA

⚠ The problem

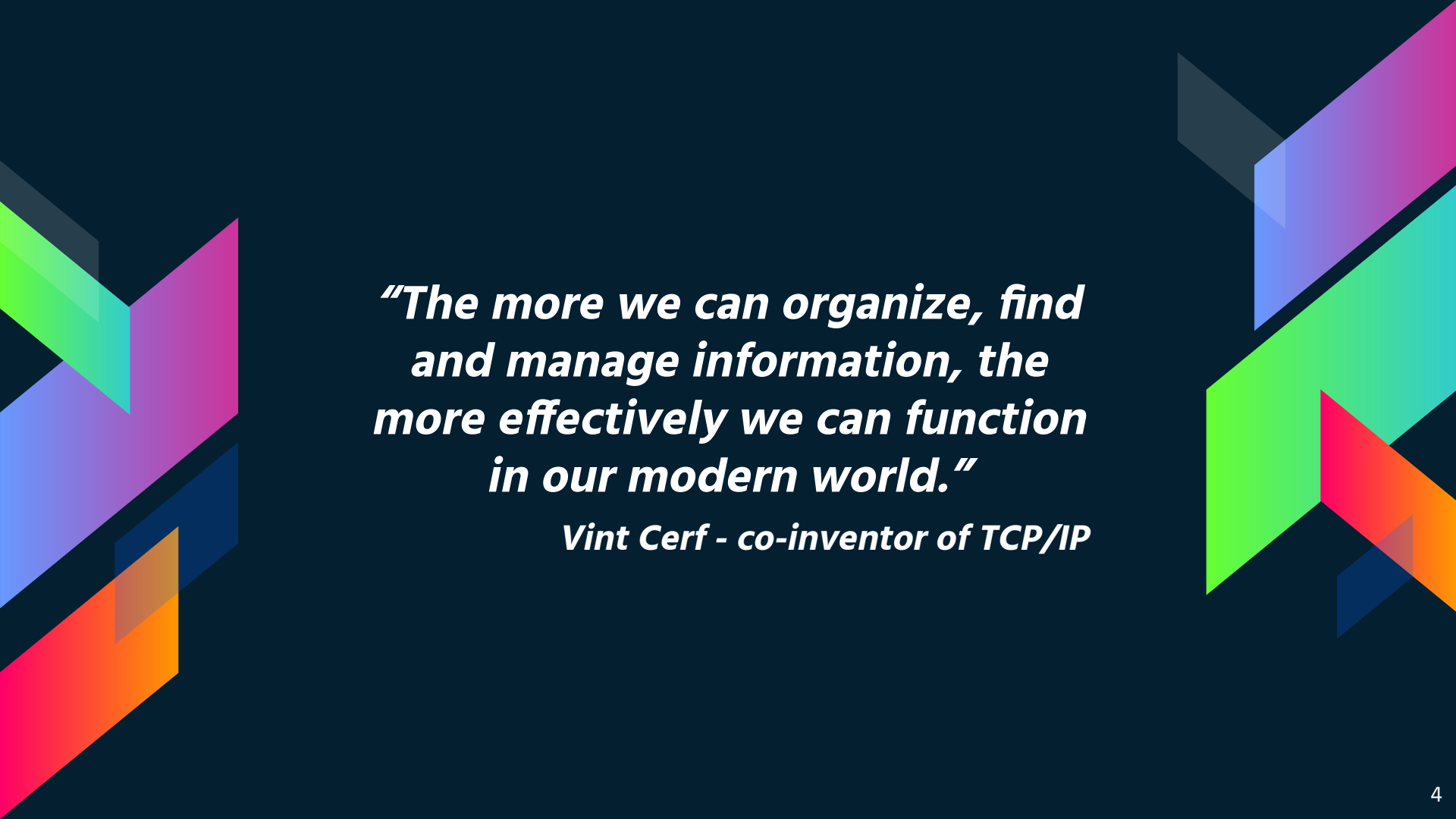
- › People focus on efficiency, especially financially
- › The popularization of the internet has brought along e-commerce
- › Being able to make money online presented an opportunity to companies
- › The e-commerce market is flooded with web shops

✓ The solution

An application needs to be created that centralizes the options across the e-commerce market

The application needs to have the qualities:

- › Very accessible
- › Easy to use
- › Can track prices of multiple web sites
- › Easily extensible

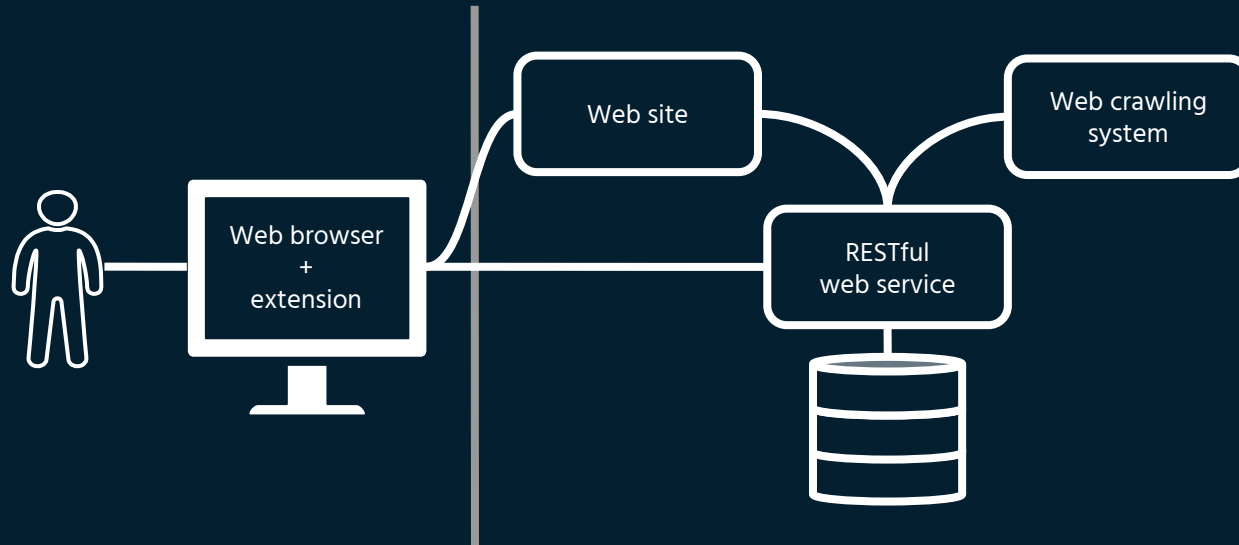


***“The more we can organize, find
and manage information, the
more effectively we can function
in our modern world.”***

Vint Cerf - co-inventor of TCP/IP

The plan

Create a system with a modular architecture

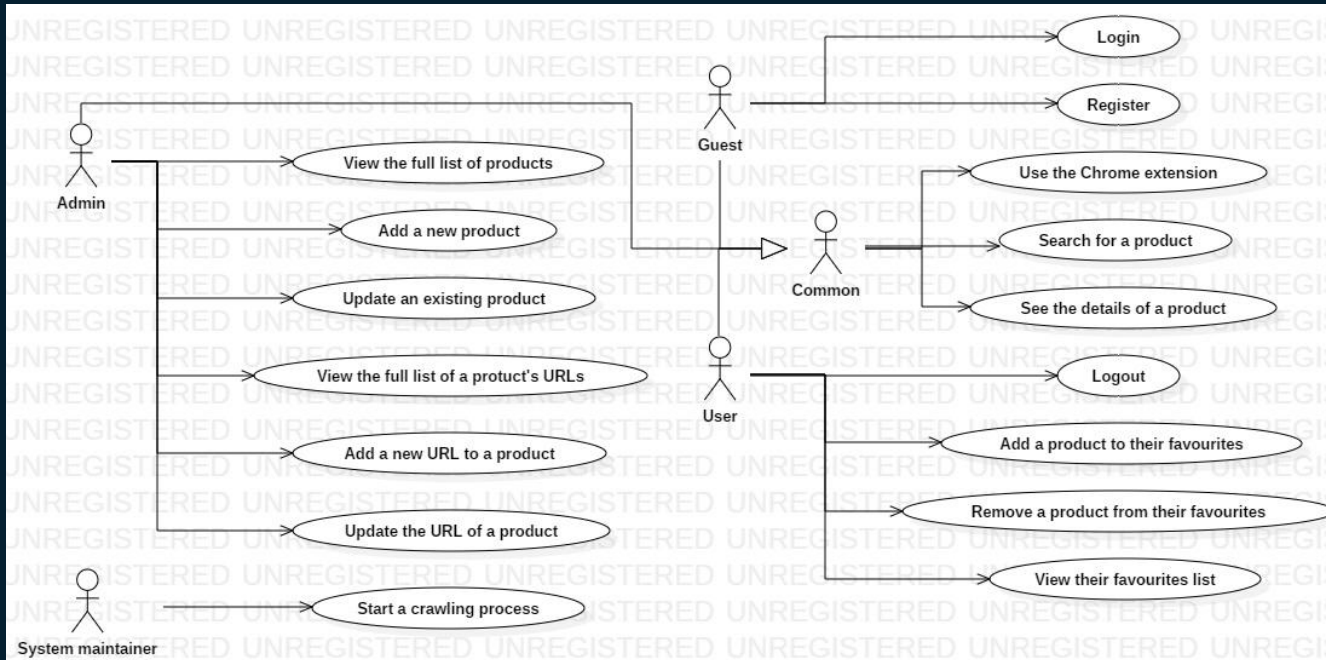


The plan

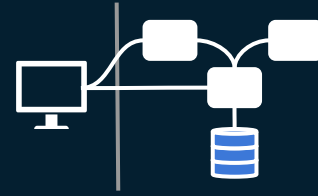


Use cases

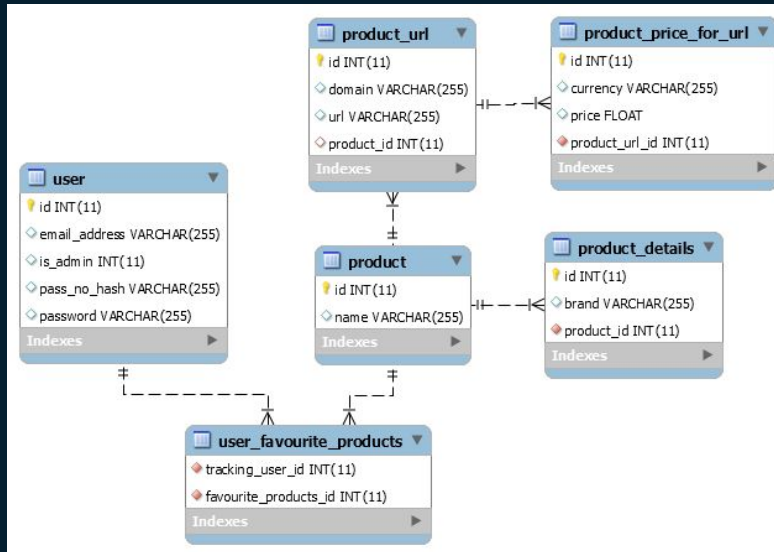
We differentiate 4 types of users of the application: Guest, User, Admin, and System maintainer



The database

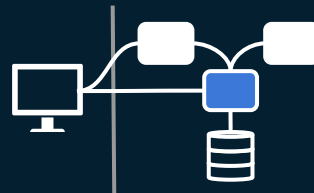


MySQL was chosen as the database management system for this application due to the fact that I need to store the product data in a structured manner





The RESTful web service



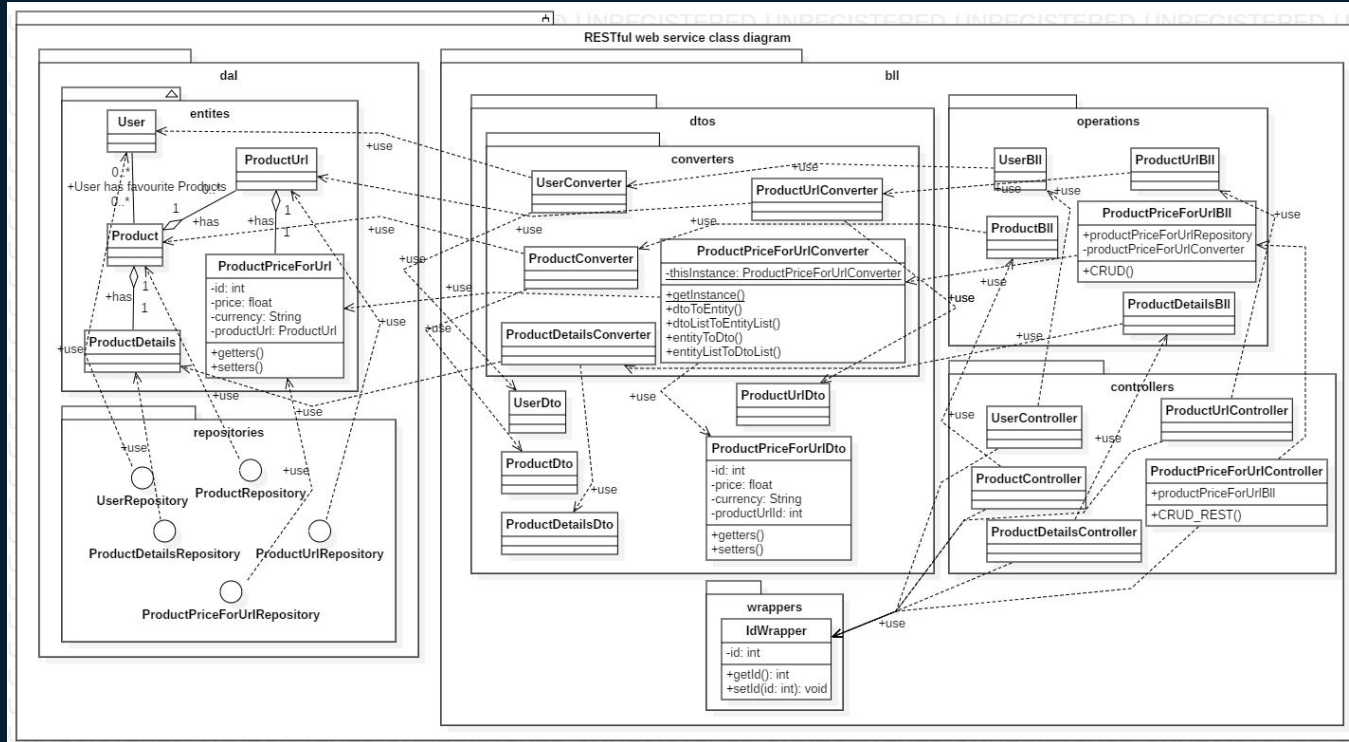
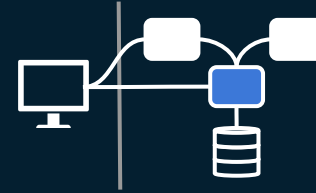
The RESTful web service is created using the Spring framework for Java 8

It acts as a uniform interface connecting the modules of the application

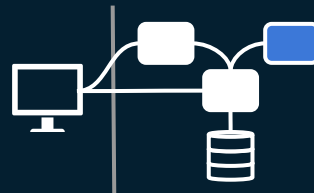
It is split into a DAL and a BLL



Classes



❌ The crawling system



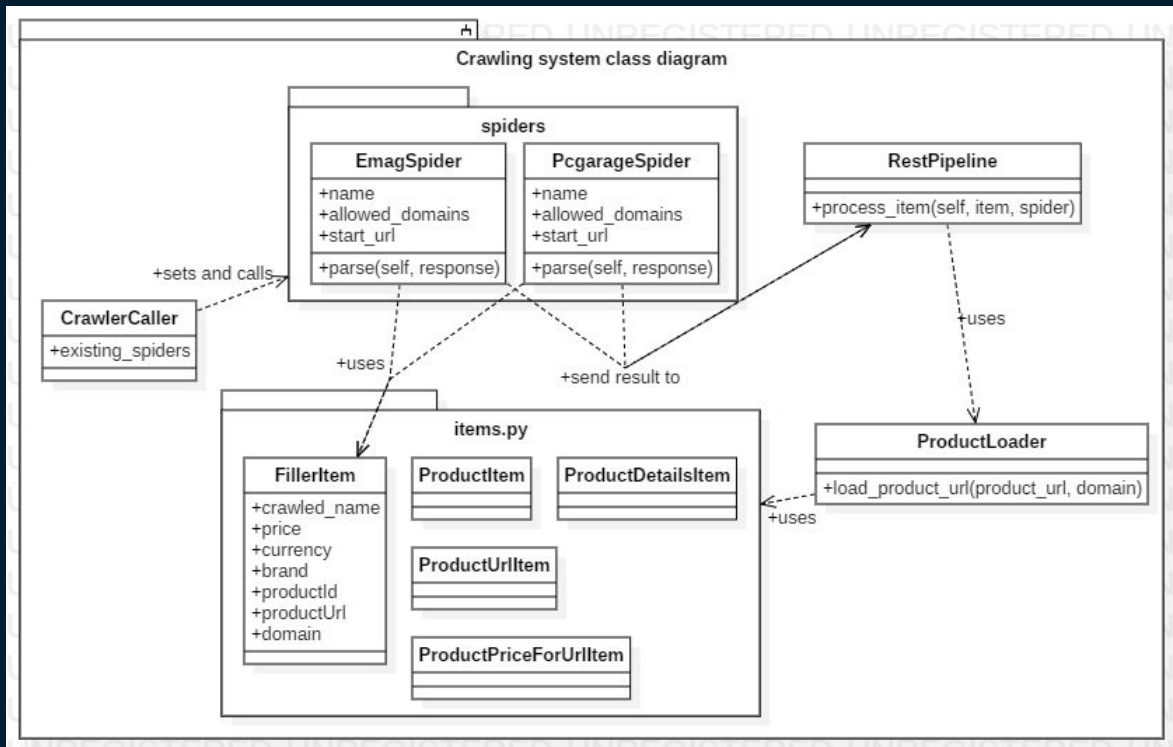
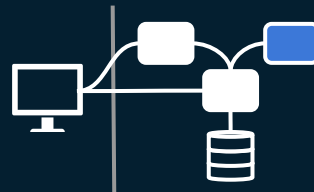
The crawling system was build using Python3 and Scrapy

It is the key element of this application

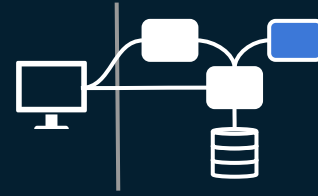
The development of this module consisted of:

- › Creating a script that starts the crawling process based on a simple command
- › Creating the necessary spiders
- › Creating an Item pipeline section to persist the extracted data

Composition



⚙️ The crawler caller



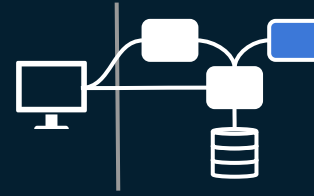
The crawler caller is the script I've created for starting the process

It works as follows:

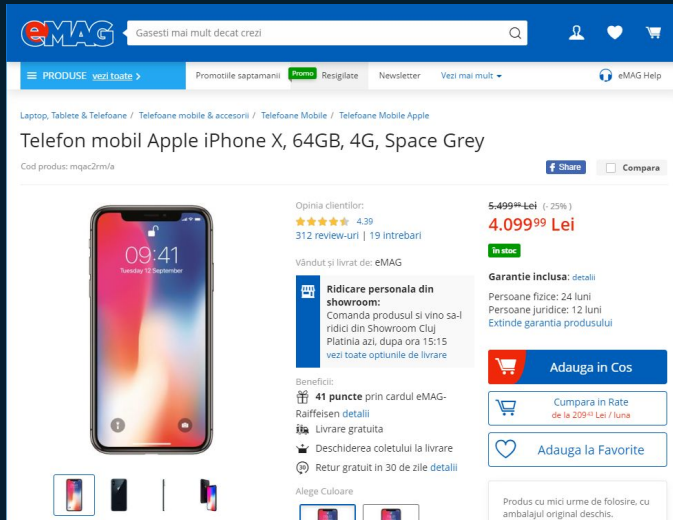
- › It requests the URLs of products belonging to the given domain
- › It sets the received URLs as starting URLs for the spider
- › It starts a crawling process with the previously mentioned URLs and the spider that has the name that has been given to it

The crawling system

🕸 The spiders

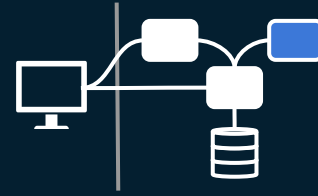


Spiders are scripts for Scrapy, which extract data from a fetched web page



`{'brand': 'Apple',
'crawled_name': 'Telefon mobil
Apple iPhone X, 64GB, 4G, Silver',
'currency': 'RON',
'domain': 'emag',
'price': 4099.99,
'productId': 1}`

⚙️ The Item pipeline



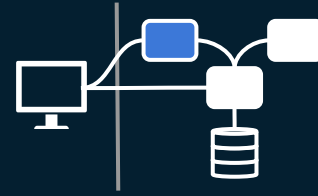
The Item pipeline is the post-processing element for extracted data

It is composed of multiple small-scale scripts, which perform some action with the data they receive

Its components are activated and sorted in the project's settings



The web site



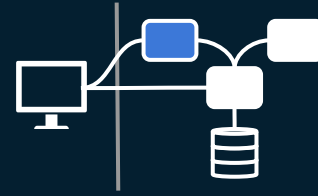
The web site of the application was built with the AngularJS framework

It represents the largest part of the application's front-end

It can act as a kind of centralized web shop interface

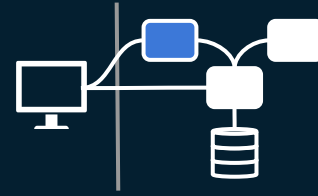
The web site

User permissions

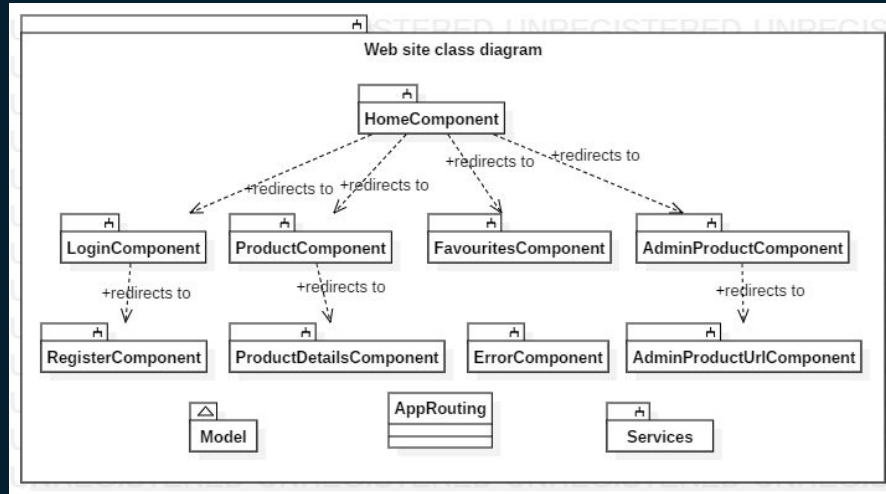


Operation	Guest	User	Admin
Login			
Register			
Search for a product			
See the details of a product			
Logout			
Add a product to favourites			
Remove a product from favs			
View their favourites list			
View the full list of products			
Add a new product			
Update a product			
View the list of a product's URLs			
Add a new URL			
Update a URL			

Composition: layout

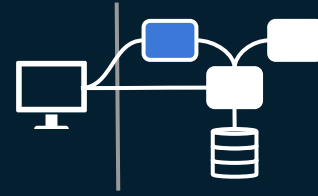


An AngularJS based web app is made of 'components'

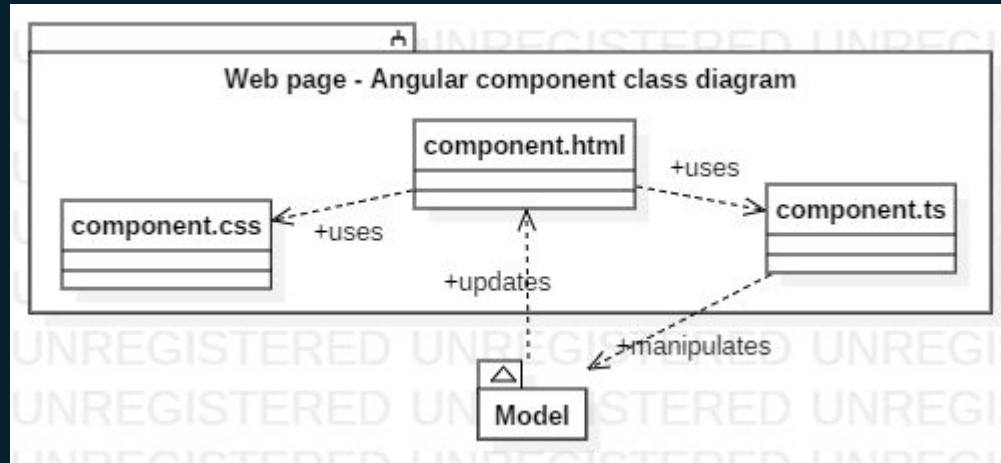




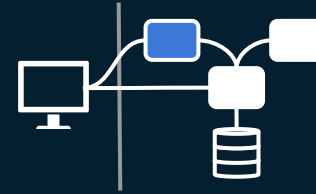
Composition: component



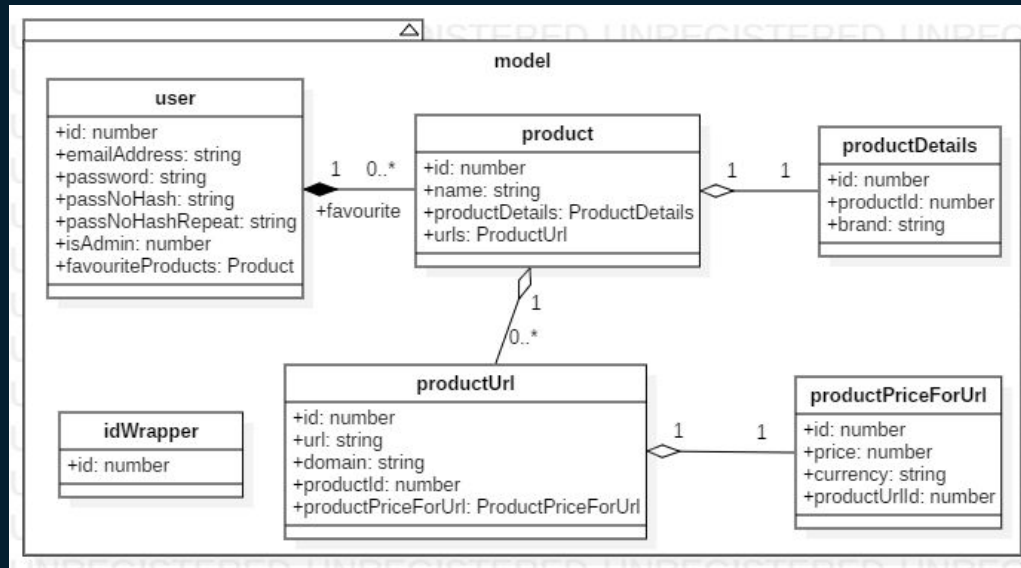
An Angular component is based on the MVC architecture



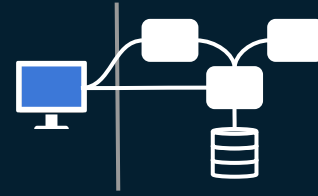
Composition: model



The model of the web app is a JavaScript copy of the model from the web service



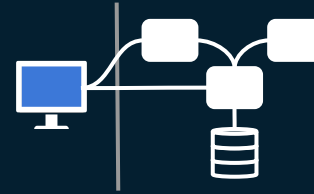
The Chrome extension



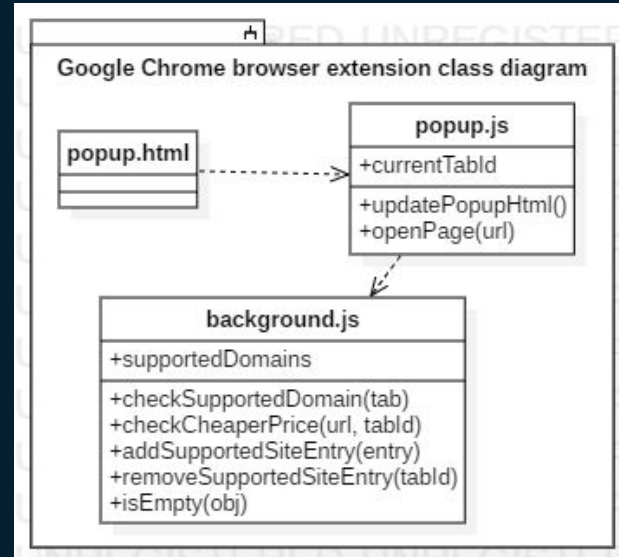
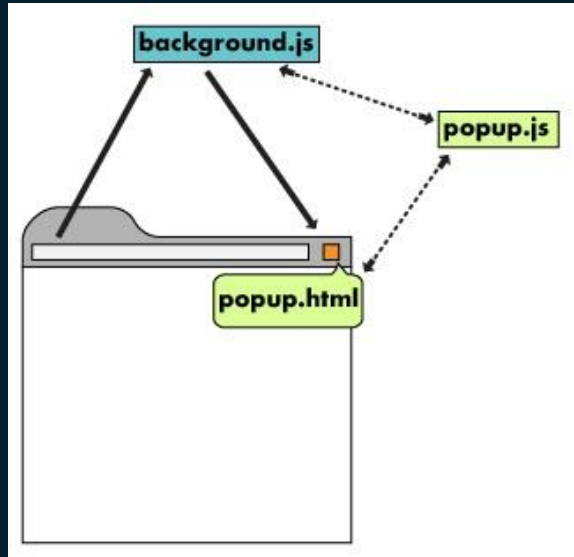
The Google Chrome browser extension is the most important element of the application's front-end

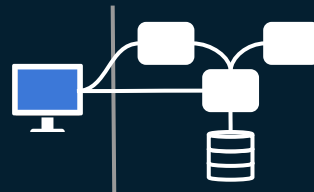
It provides the 'one-click-away' accessible solution for the presented problem

Under the hood



A Chrome extension has a simplistic, but powerful composition





Telefon mobil x Apple iPhone x Telefoane Mo x Smartphone x Telefon Mobi x Iphone X - C x +

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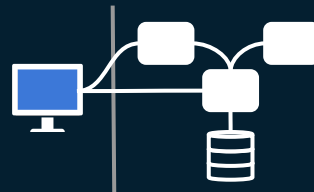
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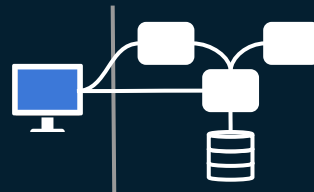
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The Chrome extension Effect



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5 comentarii

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Testing

Throughout the development cycle testing has been done manually to see if it behaves as expected

- › Using the application and its modules
- › Checking the outputted logs to track down bugs
- › Using third party applications (Postman)



Results

- ❖ Modular, extensible application
- 🔄 Up to date database of products
- 📺 Easy to use interface
- 👉 'One-click-away' tool for saving money

🔧 Future development

- 🔌 Support more domains & products
- 🖥️ Make a prettier user interface
- 🕒 Automate the crawling process
- 🔗 Port the extension to other browsers
- 🛡️ Implement stronger security measures



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YOUR ATTENTION!**