

Sri Lanka Institute of Information Technology

ONLINE MARKET PLACE FOR ORAGNIC FOODS USING BLOCKCHAIN

Analysis Project - I Software Requirements Specification (SRS)

Project ID – 19_20-J 06

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Declaration

We hereby declare that the project work entitled “ONLINE MARKET PLACE FOR ORAGNIC FOODS USING BLOCKCHAIN”, submitted to the Sri Lanka Institute of Information Technology is a record of an original work done by us, under the guidance of our Supervisor Dr. Dharshana Kasthurirathna. This project work is submitted in the partial fulfillment of the requirement for the award of the degree of Bachelor of Science (Special Honors) in Information Technology. The Results embodied in this report have not been submitted to any other University or Institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

D.K.G.S.H.LIYANGE

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Name

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Signature

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1 INTRODUCTION

The Software Requirements Specification is designed to document and describe the agreement between the customer and the developer regarding the specification of the software product requested [5]. Its primary purpose is to provide a clear and descriptive “statement of user requirements” [5] that can be used as a reference in further development of the software system. This document is broken into a number of sections used to logically separate the software requirements into easily referenced parts.

This Software Requirements Specification aims to describe the Functionality, External Interfaces, Attributes and Design Constraints [4] imposed on Implementation of the software system described throughout the rest of the document. Throughout the description of the software system, the language and terminology used should unambiguous and consistent throughout the document.

1.1 Purpose

Defining and describing the functions and ONLINE MARKETPLACE FOR ORGANIC FOODS USING BLOCKCHAIN is the primary goal of this Software Requirements Specification (SRS). This Software Requirements Specification illustrates, in clear terms, the features, functionalities, non-functionalities, system requirements (Hardware and Software requirements), the interfaces of the system, the system capabilities and operations and the constraints under which it must operate. Initially this document gives detailed descriptions about similar systems and research areas which has been studied previously, and discuss the problems, limitations and drawbacks identified in the existing systems. So the readers of this document can directly get an idea of the current problem and can focus to this system with a general idea of what the system is which is meant to be developed. Also this document describes how the system will differ from other systems and how it has targeted to achieve its objectives while overcoming the existing problems.

The intended audience of this document is our primary ONLINE MARKETPLACE FOR ORGANIC FOODS system customers and developers, Dr. Dharshana Kasthurirathna, (2019 CDAP 19_20-J 06 Group) 4 members, as well as the other students attending CDAP that will require access to such documentation

1.2 Scope

The software system being produced is called ONLINE MARKETPLACE FOR ORGANIC FOODS USING BLOCKCHAIN. It is being produced for customers an opportunity to find fresh, organic products with ease by ensuring that all steps from food production to delivering it to the customer are transparent and reliable. At the same time, we wish to analyze the amount of sales at a given time frame and within the next quarter via the Internet.

The system is to provide an organic food detection web application which include block chain technology to store all related steps throughout the food supply chain and also an analysis of product review to identify and detect which comments are fake, spam or not. Using the output of this analysis a sentiment analysis will be performed. Finally, when customers order a product based on some constraints like time, destination, cost the application will show an optimal path to deliver the product to the customer.

This document mainly covers the area of analysis of product review to identify and detect which comments are fake, which are spam, which are original by using ontology. Ontology is a formal representation of the knowledge by a set of concepts within a domain and the relationships between those concepts [1]. Ontology is can be used to share common understanding of the structure of information among people or software agents, to enable reuse of domain knowledge, to make domain assumptions explicit, to separate domain knowledge from the operational knowledge and analyze domain knowledge etc. [2].

Through our system, customers can comment on their thoughts about the products that the bought. System should analyze those comments and must identify which are fake, which are spams or which are original. Then the system filters the original comments which are related to product. In here we have to find data set by searching related products similar to organic foods in social media platforms like fb, twitter etc. The that data set should train to categorize user comments into quality wise, price wise etc. for this entire process system is use ontology.

1.3 Definitions, acronyms, and abbreviations

FB	Facebook
Customer	A person that is actually brought products.
SRS	Software Requirements Specification.
UI	User interfaces
AI	Artificial Intelligence
Spam comments	Comments which are not related to product and doing using illegal ways.
Fake comments	Comments which are related to product or not but posting without buying our products.
Original comments	Comments which are posting after having experience of our products.
OWL	Semantic Web language designed to represent rich and complex knowledge.

1.5 Overview

Developing ontology to analyze comments and detect spam comments, fake comments. Original product-related comments are categorized into groups. Detecting original products related comments is very important in this scenario. Fake and spam comments are given customers to fake analysis and because of that identifying customer's real experience is important.

2 Overall Descriptions

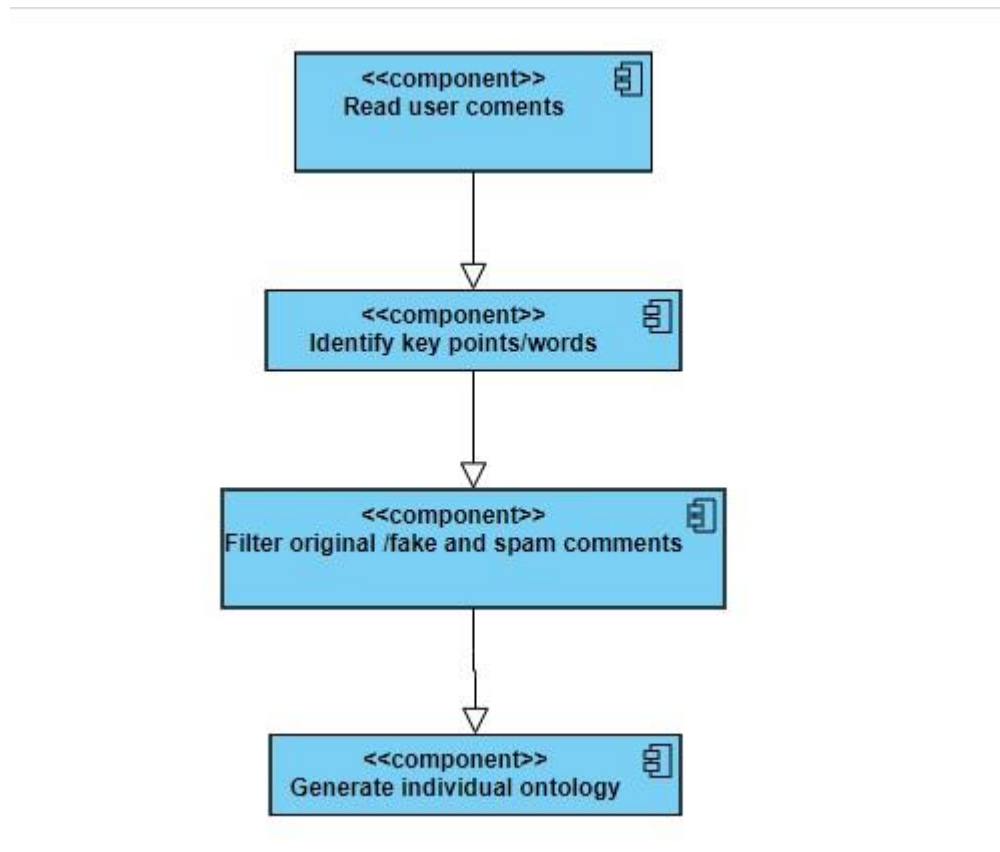


Figure 1 – Simple component diagram about how system works

This section includes details about what is and is not expected of the Analysis of Product Reviews to Detect fake and Spam Reviews, in addition to which cases are intentionally unsupported and assumptions that will be used in the Analysis of Product Reviews to detect fake and Spam Reviews.

In the developing and globalizing world, measuring and evaluating customer satisfaction for organizations operating in the trade field and using this information to improve customer experience has become a key to gain advantage in today's competitive market. Thus, organizations that develop new products / services or market improved products / services will be able to effectively increase service qualities, capture customer trust and reach a stable customer portfolio in product usage. Because of that analyzing customer satisfaction becomes very important. There are many illegal ways to promote products as well as some people are trying to decrease products market value by using illegal ways like commenting fake news about that products. The problem is that activities put others in trouble for chosen good quality products. The system we proposed is aim to minimize that problem related to the comments.in here system detect fake comments, illegal comments and take only real user comments for analyze. It helps people to get a good idea about each product.

2.1 Product perspective

Although there have been some researches related to analysis of product reviews to detect fake and spam reviews using ontology.

The research **“A knowledge extraction system from online reviews using fuzzy logic” [3]** is research on semantic analysis from hotel reviews using the ontology as a knowledge base for hotel information extraction and storing, and using the parser to solve the semantic analysis problem. But the problem of the proposed system is it's incapable of handling the ambiguity present in modern English grammar rules such as idioms, similes, etc. and not consider fake comments.

The research **“Adequate assessment of the customer's actual reviews through comparing them with the fake ones” [4]** is proposed the ontology model of hotel services and ontology models of Simple sentences. The representation of the ontology models allow translating the model into a RDF schema, which will use for generating reference fake reviews. Here they are unable to detect spam comments and because of that accuracy level is very low.

In any of the above researches they have not considered fake comments as well as spam comments in the same system. We are hoping to detect spam and fake comments in order to give customers to accuracy analysis for each product.

2.1.1 System interfaces

- Protégé.

Protégé is a free, open source ontology editor and a knowledge management system. Protégé provides a graphic user interface to define ontologies.

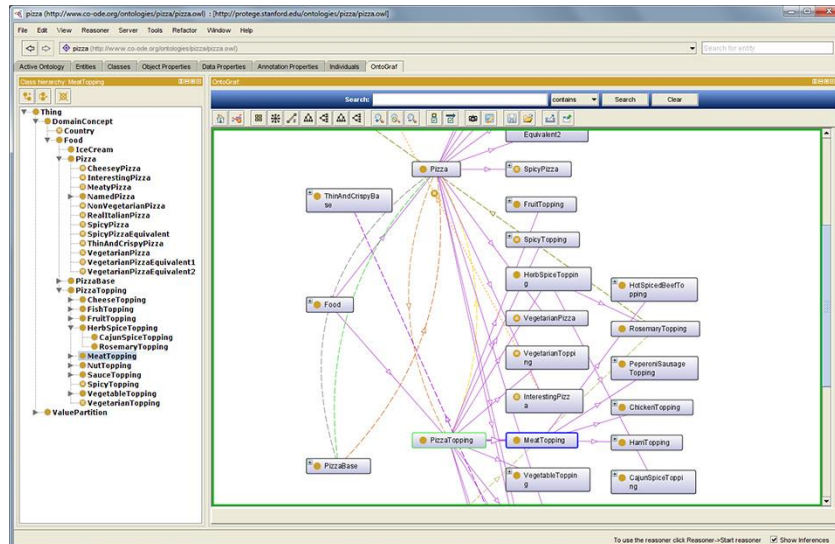


Figure 2 – protégé interface

2.1.4 Software interfaces

- Python
Python is used as programming language to build system.
- SOARQL query editor (Virtuoso SPARQL Query Editor)
SPARQL is a query language and a protocol for accessing RDF designed by the W3C RDF Data Access Working Group.
- OWL
Semantic Web language designed to represent rich and complex knowledge about things, groups of things, and relations between things.

Virtuoso SPARQL Query Editor

[About](#) | [Namespace Prefixes](#) | [Inference rules](#) | [RDF views](#) | [SPARQL](#)

Default Data Set Name (Graph IRI)

Query Text

```
select distinct ?Concept where {[[] a ?Concept} LIMIT 100
```

(Security restrictions of this server do not allow you to retrieve remote RDF data, see [details](#))

Results Format:

Execution timeout: milliseconds (values less than 1000 are ignored)

Options:

- ☒ Strict checking of void variables
- ☐ Log debug info at the end of output (has no effect on some queries and output formats)
- ☐ Generate SPARQL compilation report (instead of executing the query)

(The result can only be sent back to browser, not saved on the server, see [details](#))

Figure 3 – Virtuoso SPARQL Query Editor interface

2.1.6 Memory constraints

- 500Mb of the memory is used to detect data and identifying key words and store them as well as detect and filter spam, fake, duplicate such comments which are not related to the product.
- Server should have minimum of 4GB RAM since the heavy machine learning functions should be perform at real-time.

2.1.7 Operation

- Customers are allowed to comment on anything in the comment section.
- Customers are not allowed to post multiple comments at the same time.
- Identify and detect key words trained data set and choose each category.
- Analyze and filter Spam/fake/duplicate/and original comments etc.

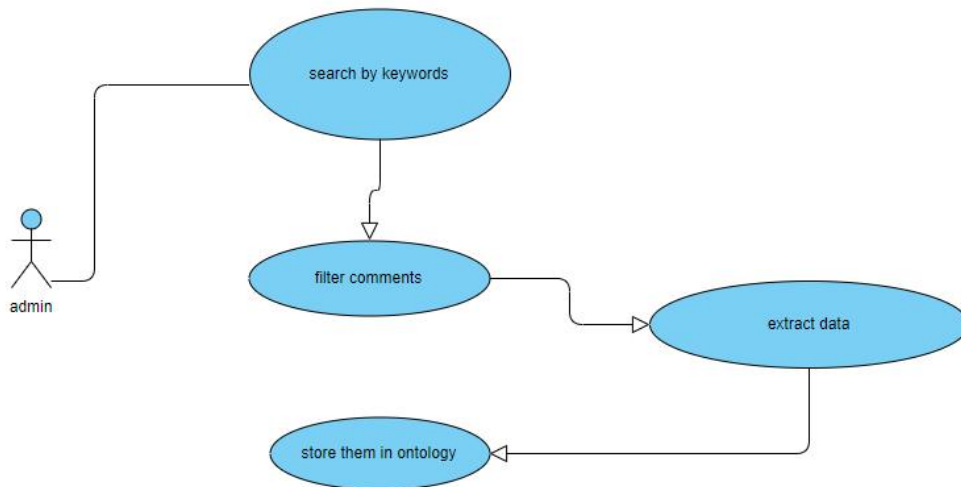
2.1.8 Site adaptation requirements

- Customers should post their comments in English only and symbols, picture comments are not allowed for the output.
- Comment section should not be limited and customer should exactly brought our products to take their comments to process.

2.2 Product functions

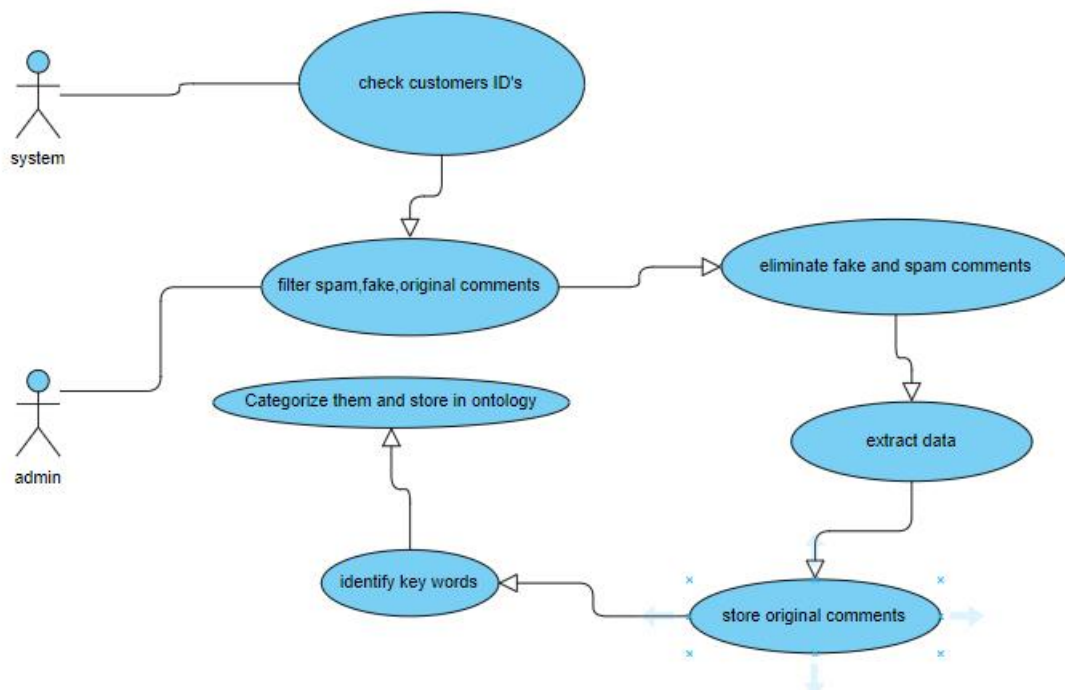
Use case ID	01
Use case name	Store data
Actors	System
Pre-conditions	Build ontology
Post conditions	System can access to the data.
Steps	<ol style="list-style-type: none">1. Filter data.2. Original comments weighted in ontology.

Use case ID	02
Use case name	Identifying key words.
Actors	System
Pre-conditions	System should have train data sets.
Post conditions	Store and weighted in ontology.
Steps	<ol style="list-style-type: none">1. Analyze the customer's comments.2. Identify key words in the comments.



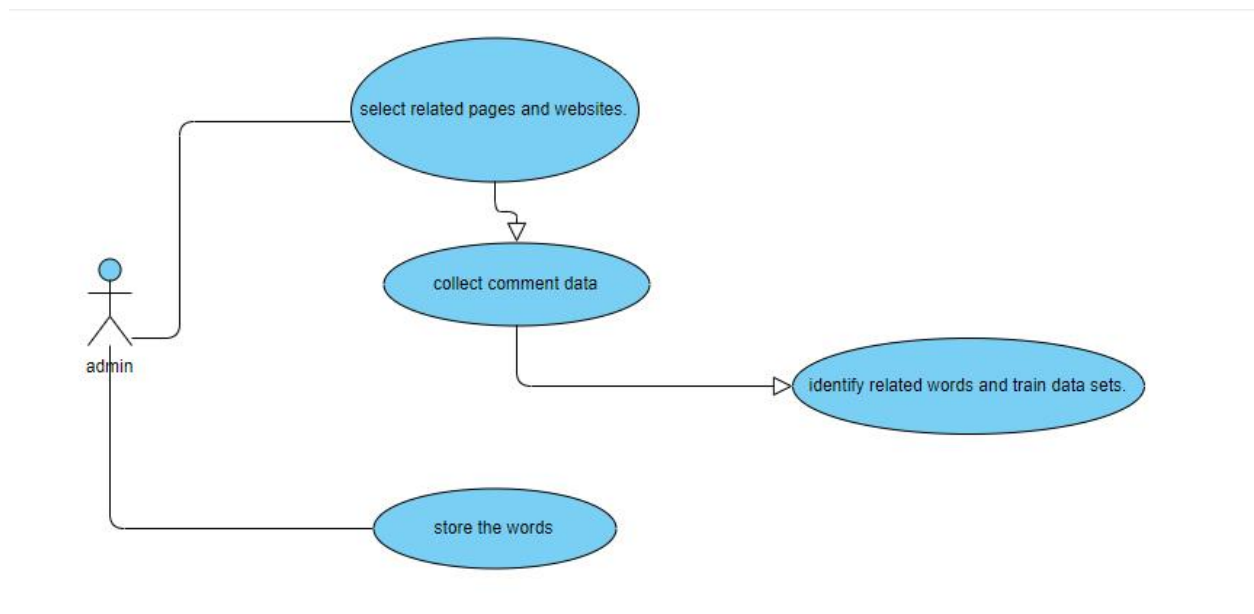
2.2-2: use case diagram_1

Use case ID	03
Use case name	Identifying spam, fake comments.
Actors	System
Pre-conditions	System should have customers IDs
Post conditions	Analyze and eliminate spam and fake comments.
Steps	<ol style="list-style-type: none"> 1. Analyze the customer's comments. 2. Access user ID's and checks commented customer exactly brought products. 3. Check comments are related or not to the products. 4. Eliminate comments which are not related to product and comments that are posting without buying our products.



2.2-2: use case diagram_2

Use case ID	04
Use case name	Identifying original comments.
Actors	System
Pre-conditions	System should detect spam and fake comments.
Post conditions	Store and weighted in the ontology.
Steps	<ol style="list-style-type: none"> 1. Identify fake and spam comments. 2. After eliminating all fake and spam other comments are store in the ontology.



2.2-2: use case diagram_3

2.3 User characteristics

Customer: The typical customers can share about their thoughts, experience of using our products, reviews in the comment section.

Admin panel: Admin panel of the system can monitor, change the settings but not allowed to change customer reviews.

2.4 Constraints

Identifying key words:

- Data sets for train are taken from related pages and web sites similar to our product.
- Which are related to key words is identified as true comments to categorize.
- People have various kinds of typing methods and they use different letters for some words.

Identifying spam, fake comments:

- Without buying our products posting Comments which are not related to our products are consider as spam comments and customers who brought our products posting comments which are not related to our products are considered as fake comments.
- Same Customer is not allowed to posting several comments at the same time.
- Comment should match with key words that we have train.

2.5 Assumptions and dependencies

- Training data sets are collect from related pages and web sites and think customers are always posting comments related to that comments.
- No data will be lost/corrupted during the communication between server and web application

2.6 Apportioning of requirements

Primary requirements of this project are described in section 1 and 2. Requirements that are specified in the section 3 are referred to as functional requirements. All these requirements are intended to be consistent. If there are any inconsistencies present, they will be logged as defects. Requirements that are mentioned in both section 2 and section 3 will be implemented by referring to the section 3 because it is more detailed than section 2.

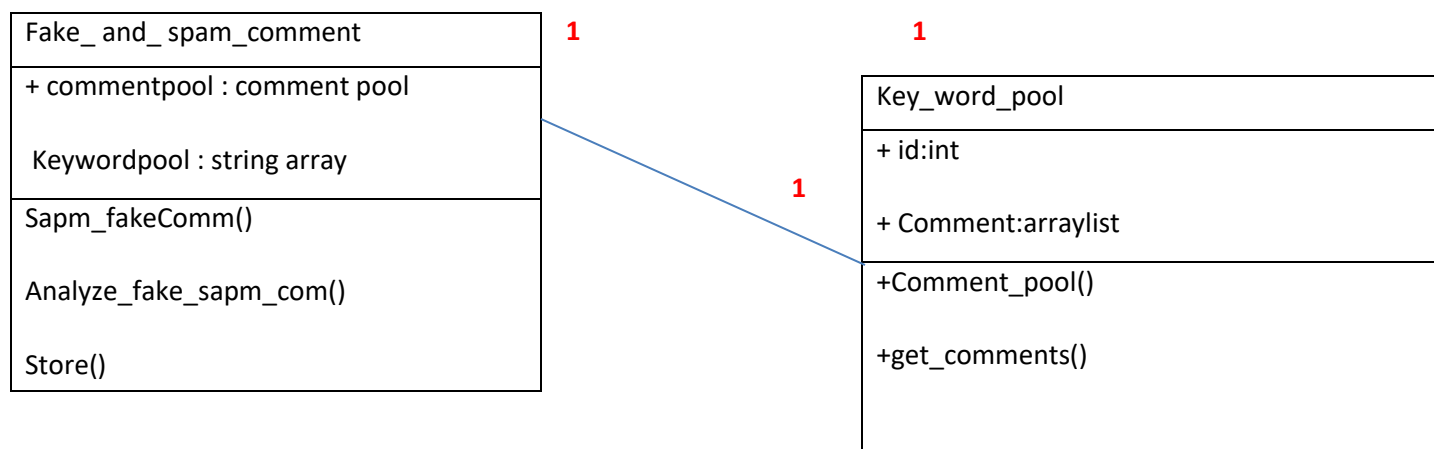
3 Specific requirements (1) (for Software Dev. Oriented Projects - SRS)

3.1 External interface requirements

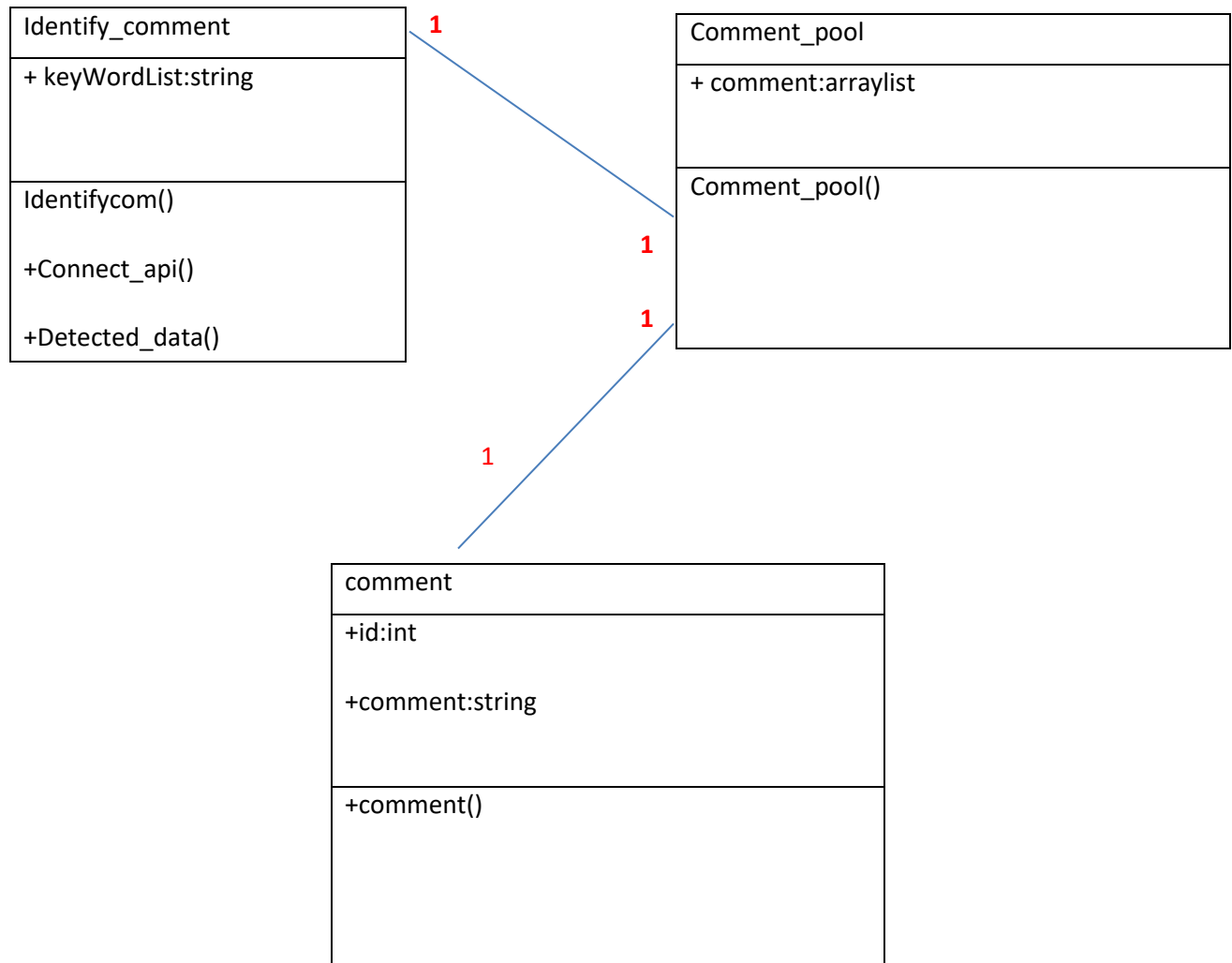
3.1.3 Software interfaces

Protégé, owl, python are used as software interfaces. Protégé is used as software platform and Python is used as programming language to build ontologies.

3.2 Classes/Objects < For Software Dev. Oriented Projects>



3.2-1: Class diagram



3.2-2: Class diagram

3.3 Performance requirements

- The system should be equipped with a decent processor and minimum of 4GB RAM which can handle the heavy processes.
- Python3
- 500MB Minimum disk space
- Following performance requirements will be handling by the system.
 - Response time
 - Scalability
 - Accuracy of the system.

3.4 Design constraints

- Speed of detecting spam, fake and original comments and other data should be less than 2S.
- Use data sets to detect related category of comment.

3.5 Software system attributes

3.5.1 Reliability

- To produce accurate results for customers as output, by filtering spam and fake comments only take original and product related comments to process.
- The data set improve and train according to our products and because of that under semantic web analysis that produce better knowledge such as freshness, quality, price etc.
- All products related data are weighted in the ontology.
- The function will be tested using several testing techniques to make sure it's probability of failure is very low value.(detecting original comments, spam, fake comments)

3.5.2 Availability

- Administrators can easily access data according to their purpose and data accessibility.
- Comment filtering and storing should be process without crashing 99.5% of the time.

3.5.3 Security

- Customers who are posting several comments that are related to the product at a specific time period are not taken for the process.
- Data can be accessed Administrators only.
- Otherwise ontology is more secure technology.

3.5.4 Maintainability

- Codes are commented and references well documented.
- Proper coding standards and naming conventions will be used at development time.
- Used Object oriented design and helpful when doing later enhancements and modifications of the functionality which used to detect and filter comments.

4.References

[1] <http://www.math.ubbcluj.ro/~didactica/pdfs/2013/didmath2013-06.pdf>

[2] https://protege.stanford.edu/publications/ontology_development/ontology101.pdf

[3] P. Kitwatthanathawon, T. Angskun and J. Angskun, "A knowledge extraction system from online reviews using fuzzy logic," *2012 Ninth International Conference on Computer Science and Software Engineering (JCSSE)*, 2012.

[4] G. Bekmanova, A. Sharipbay, A. Omarbekova, G. Yelibayeva and B. Yergesh, "Adequate assessment of the customers actual reviews through comparing them with the fake ones," *2017 International Conference on Engineering and Technology (ICET)*, 2017.

[5] Prof. Betty H.C. Cheng, "Intro to Specifications", CSE 435, East Lansing, MI, September 2007.