**Stand alone**

| | |
|---|---|
| Description | Having a standalone executable program |
| Problem | Difficulties in relation to set-up and use |
| Stakeholders concerns | Possible need to expand to other external universities/websites. |
| Related user stories | All of them |
| Solution | Use pyInstaller to convert the python program to an executable file |
| Considered alternative solutions | Using py2exe instead |
| Positive influencing forces | Compatible with both Windows and Linux |
| Negative influencing forces | More difficult to learn and use |
| Evaluation | At the moment we think this is the best solution to make the program work as a standalone file. However there are possible concerns related to other components interacting with the program that may lead to changes in the decision. |

**Database, maintain - create**

| | |
|---|---|
| Description | Implementing a database for storing and accessing questions and answers |
| Problem | Requiring huge database and slow access speed |
| Stakeholders concerns | Database size (money) |
| Related user stories | T1 |
| Solution | - Make our own database using SQL<br>- Using design methods that minimises the memory needed for storing the data.<br>- Creating databases for easy storing and retrieving.<br>- Have a designated server |
| Considered alternative solutions | - Using already existing code<br>- Using Google's Firebase |
| Positive influencing forces | - Better fitted for our type of data (Reduction of unnecessary data)<br>- Have experience from previous use |
| Negative influencing forces | - Hardware costs<br>- Time consuming |
| Evaluation | We choose to use SQL because this is the database language being currently taught. Having a designated server relieves us of the trouble of having to transfer the data. Optimisation of design methods is part of what has been taught, therefore we use it here. |

**Scraping**

| | |
|---|---|
| Description | Retrieving information/data from websites |
| Problem | Need information from already existing/ used websites |
| Stakeholders concerns | Information is collected from an already used platform |
| Related user stories | T1,T2,T3 |
| Solution | Use Scrapy to collect data from Piazza |
| Considered alternative solutions | - Parsehub<br>- Outwit Hub<br>- Spinn3r<br>- piazza-api |
| Positive influencing forces | - Well known and tested<br>- Easy to find information about the software online<br>- Compatible with Python<br>- Extendable to server |
| Negative influencing forces | - May be difficult to learn |
| Evaluation | After considering several alternatives we are confident that this is the best choice for our goal. It is compatible with both the server technology we have chosen to use as well as the programming language we choose. |

**Data analysis**

| | |
|---|---|
| Description | Create a bot that has the ability to retrieve and insert data into a database, uses this data to analyse the question and output an appropriate answer |
| Problem | Difficulties regarding analysis of natural language and data to find a good answer |
| Stakeholders concerns | Takes a lot of time to access the database and analyse the questions and retrieving and outputting the answer, i.e. uses a lot of resources |
| Related user stories | T4, T7 |
| Solution | - Reuse of optimised code in Python<br>- Optimise the code ourselves |
| Considered alternative solutions | - Reuse of not-optimal code<br>- Make our own algorithms |
| Positive influencing forces | - Less time needed to create a new algorithm<br>- Less resources needed.<br>- Time before an answer is given is minimal. |
| Negative influencing forces | - Time consumption<br>- Difficult to optimise |
| Evaluation | We decided to reuse code for the sake of productivity because we consider this the most time consuming part of the project. |

**Uptime**

| | |
|---|---|
| Description | The bot should be up and running nearly 100% of the time and nearly always be available. |
| Problem | Downtime leads to an unreliable service. Up to date. |
| Stakeholders concerns | Availability |
| Related user stories | T7 |
| Solution | Set up the database and BOT on an external device with internet connection (a PC) |
| Considered alternative solutions | - Reduce uptime and use an “internal” device, i.e. professors/university’s computer<br>- Use designated server |
| Positive influencing forces | Ability to give answers at all times, instead of only at certain hours. |
| Negative influencing forces | Need hardware resources |
| Evaluation | We want a reliable service, therefore an uptime of close to 100% is essential. We think this is the best solution considering available hardware resources. |