
**SOEN342**
Software Requirements and Specifications

# E-Academy

Vision Document (Phase 2) of The Craigstutors E-Academy

**Instructor:**
**Dr. Joumana Dargham**

Team: CraigsTutors

Christina Darstbanian - 40097340 (**Team Leader**)

Ghaith Chrit - 40114180

James Partsafas - 40170301

Tony Yang - 40171440

Divleen Kaur Ahluwalia - 40116121

Jan Mikhail Alexei Ong - 40154849

Xavier Morgan-Tracy - 40129775

Chad Buck - 40030617

Daniel Soldera - 40168674

DATE: 10/28/2022

**Github Link if needed:https://github.com/JamesPartsafas/soen342**

# 1. Introduction

The aim of this vision document is to compile, examine, and describe CraigsTutors top-level functional and non-functional requirements, characteristics,risks, problems of system-as is and solutions implemented in system-to be . The main focus is placed on the capabilities, features and functionalities entailed by the various stakeholders, including but not limited to students and tutors, of the application. Additionally, this document provides an adequate justification for those requests. The standards set by the stakeholders are checked for compliance using use case diagrams and the additional specification sections. Moreover, this report provides a brief investigation into the business needs and market where the application will be deployed.

CraigsTutor will encompass two main interfaces: a tutor and a tutee. The system will enable the tutee, or the guardian of the tutee, to schedule a tutoring session based on the subject, personality quiz, and availabilities of both sides. Tutors, on the other hand, will be permitted to provide sessions based on their schedules. Tutors will also be allowed to withdraw their earnings from the application whenever needed. Furthermore, CraigsTutor will accommodate the tutors and tutees by providing an online meeting space to hold the sessions. Finally, CraigsTutor will give an administration of a  full capability over the application to manage many aspects including but not limited to checking tutor’s academic records, deleting any user, and checking a user’s calendar for any meetings or availability.

## 1.1 References

All references used were on October 25, 2022

[1]J. Gaubys: "Most popular web browsers in 2022 [sep '22 update]," *Oberlo*. [Online]. Available: https://www.oberlo.ca/statistics/browser-market-share. [Accessed: 25-0ct-2022].

[2]"Diagrams.net - free flowchart maker and diagrams online," *Flowchart Maker & Online Diagram Software*. [Online]. Available: https://www.draw.io/index.html. [Accessed: 25-Oct-2022].

[3]"Find the best qualified and affordable tutors online," *TutorOcean*. [Online]. Available: https://www.tutorocean.com/. [Accessed: 25-Oct-2022].

# 2. Positioning

## 2.1. Problem Statement

| | |
|---|---|
| The problem of | *The current system-as is lacks the capability of finding tutors that match with the personality, availability and limitations of students. It also lacks enough resources of books and question banks for both tutors and Students. Moreover, the system-as is lacks interactive learning and personalized teaching methods for students.* |
| Affects | *Students in need of supplementary academic assistance, their parents and the tutors* |
| The impact of which is | *That it is difficult for students and parents to find a suitable tutor that matches their personalities and time availabilities in the subject(s) in which they need help without spending a considerable amount of time searching through various tutoring websites/services. Therefore discourages both students and parents to apply for this service and can cause some negative impacts on students' academic success.In case if they apply but the learning environment is not interactive and the student is not comfortable with the tutor they are with, this can lead to conflicts, poor student evaluation and eventually withdrawal of the student from the service and thus for the company to lose a client.* |

| | |
|---|---|
| A successful solution would be | *System-to be provides an algorithm that automatically matches students with tutors that have similar personality traits as well as matching their availabilities, language or special restrictions.In addition that the system-to-be provides AR-VR support interactive environment and nano learning personalized assistance feature.* |

## 2.2. Product Position Statement

| | |
|---|---|
| For | *Students in need of supplementary academic assistance, parents who apply for their children,the tutors who are looking to gain experience in this field of tutoring and teaching. System administrators who are looking for career experience in the field of management.* |
| Who | *There are students who have trouble learning from their teachers at school because of factors such as physical disability (hearing problems, developmental delays), language barriers, an unexciting class environment, or a boring or difficult topic.* |
| The Craigstutors E-Academy | *Is a website and software product* |
| That | *Provides features of personality match, nano and adaptive learning as well as AR/VR integrated support. In other words, it delivers an interactive and educational tutoring site that provides excellent quality service for all stakeholders.* |

| | |
|---|---|
| Unlike | *Current e-academy sites which require students or parents to search for long hours to find suitable tutors, lack personalized solutions for every student and do not take into consideration students' needs through evaluations during sessions.* |
| Our product | *It has auto matching personality test feature,personalized specific adapted tutoring service, AR/VR supported interactive environment,Nano and adaptive learning that makes the site unique and make it evident that we have taken unique measurements to provide a remarkable learning platform.* |

# 3. Stakeholder Descriptions

## 3.1. Stakeholder Summary

| Name | Description | Responsibilities |
|---|---|---|
| *Administrators* | *Manage the website.* | ● *Manage the website by running automated background checks on potential candidates.*<br>● *Monitor sessions and take proper disciplinary action if anyone behaves inappropriately.*<br>● *Follow market demand and change and try to manage* |

| | | |
|---|---|---|
| | | *adapted solutions that correspond to the same.*<br>● *Hire tutors and provide refunds when needed.* |
| *Designer* | *Makes the blueprint for the website.* | ● *Overall design of the system and its components.* |
| *Testers* | *Test the platform for quality purposes.* | ● *Work in collaboration with developers to assess system quality by detecting defects.*<br>● *Testing and validating system features and functionalities according to the requirement document.* |
| *Developers* | *Personnel responsible for the development of the system in accordance with the system requirements and user needs.* | ● *Development of the application.*<br>● *Fix any issues or bugs encountered.*<br>● *Responsible for modifying any feature/ functionality to adapt any new changes input.*<br>● *Ensures that the system will be maintainable.*<br>● *Maintain the system by patching regularly.* |

## 3.2. User Summary

| Name | Description | Responsibilities | Stakeholder |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Students* | *The users who will avail of the tutoring services offered by the website.* | • *Ensure a good internet connection*<br>• *Book lessons well in advance*<br>• *Maintain proper behavior towards other members on social media and toward tutors while communicating*<br>• *Attend all examinations*<br>• *Respond to Nano and adaptive learning.*<br>• *Ensuring that the payment information is correct and that all payments are made timely.* | *Parents (Students represent the needs of the student and parent both. The parent ensures that all payment information is correct and that payments are made timely).* |
| *Tutors* | *Users providing the tutoring service* | • *Good communication skills.*<br>• *Being proficient at navigating the e-learning system.*<br>• *Maintaining proper behaviour throughout communication with parents and students.* | |

| | | | |
|---|---|---|---|
| | | • *Prepare evaluations for students and assess them.* | |

## 3.3. User Environment

The product is a website to be used by elementary school students and their parents to find and pay tutors to teach the students a wide variety of subjects over a specialized video call with the tutor that offers multiple interactive elements not available in a normal video call such as an interactive drawing board or AR related activities and visuals. The website is also a way for tutors to provide teaching services online at an hourly rate after being hired by the admins, while also being provided with reference materials, exercises and quizzes from the website's online resource bank.

The tasks the site must accomplish, and their associated users are as follows: Booking a session as a student or parent, completing payment from parent to tutor, completing the personality quiz as a tutor and student, setting up the profile as a tutor, entering a meeting for students, parents and tutors, deleting an account as an admin, and creating an account for guests. In each of these tasks, the number of people involved won't change unless a new type of user is added, which is very unlikely. The range of the time it takes for every task is based on some level on the strength of the user's internet connection, however the time estimates given are assuming decent quality with full bars but can change if these requirements aren't met.

Hiring a tutor requires 2-3 people to be involved depending on whether the student or the parent creates the booking. The student/parent needs to log in, search for a course, do the personality quiz to be given recommended tutors (if they haven't completed it already), then select the tutor, set up a course schedule with the tutor, and if the person choosing the course is a student, they must receive confirmation from their parent's account before the booking is final. This process is mostly designed to not take very long with everything except the personality quiz being about 5-10 minutes depending on how thorough their search is and if the parent is available to give confirmation for their child's selection.

Since the parent and the tutor must both provide payment info when they create their account, no one needs to input any info after the session concludes. As long as the website picks up that the tutor showed up for at least 15 minutes for the meeting, once the meeting time concludes, a charge is sent to the parent to be paid to the site (which relies on the payment service

the parent put in, but shouldn't take more than 1-3 minutes to receive). As soon as that transaction is received, the site deducts the appropriate percentage from the pay as a commission to the site, then sends the money to the tutor as payment using their financial info within 1-3 minutes of the money being received from the parent. This entire process happens in the backend as automatic confirmation emails are sent to the parent and tutor once all is processed.

The personality quiz can take up at least 5-10 minutes on its own, given it needs to be specialised to separate the different students among the different tutors. Given that it is a non-repeatable task, it is still reasonable to take that amount of time. With each question being multiple choice and offering simple button prompts, the user can navigate through the quiz quickly if they so choose.

The tutor needs to have set their profile up with information about them, including their results of the personality quiz given to the students, the topics they can teach and the languages they speak, and fill in their time sheet with availabilities. The information needed is very in depth so filling in the profile may take up to 10-15 minutes without the quiz as planning their schedule is expected to take some thought. After that, some form of confirmation documents must be sent to confirm any academic assertions made in the profile (for example: if the tutor says they have a PhD in a subject, they must send proof of that PhD's existence like a transcript or certificate). The confirmation process may take a while as they may require manual analysis from an admin, and hence could take a few days to complete.

Entering a meeting will only require a few button presses as from the main page shown after login a notification will show the meeting room link for a meeting that is happening within the next half an hour or has already begun. Otherwise, navigating to the upcoming meetings page will also show the link as well as upcoming links for future meetings, meaning the process should only take a minute at most.

To delete a tutor, the admin must first find the profile of the user they wish to delete, this can be done by searching for the tutor with the same search functions the other users have access to (search by name, course type, time available, etc.). Once on the tutor's page a delete button will be visible like the one the tutor sees, which when pressed prompts the admin for their password as confirmation. This only takes 1-2 minutes if the admin knows which tutor needs to be deleted in advance (which they should as all delete requests should be received as emails from users to the company email). Deleting any other user (except other admins) is similar, but the search options are more limited as they can only search by name or by ID number.

They have their own profile pages with delete buttons so the process from there is the same.

To create an account as a guest, they must press the create account button on the home page, select the type of account they want (they can't select admin accounts as those can only be created by other admins), and enter their basic information (name, email, age). Once this is put in, the site prompts the user to add type specific info, for students the info is the account number of their parent's account (if their parent's account doesn't exist, they can't create their account), for parent's it's their financial info, for tutors it creates the account but prompts them to set up their profile (see above).

The system platforms in use are the main browsers used in most devices (Safari, chrome and firefox) which will pull up the website. Since the application is a website, the only environment constraints are that it can be accessed in any environment with Wi-Fi on both mobile and desktop platforms with no plans for future platforms. Integration with third party payment processors and resource banks is used to properly make transactions between users and the website.

## 3.4 Key Stakeholder or User Needs

Problem 1. Lacking a personality matching algorithm

Other websites (system as-is) don't always offer the means to find a tutor that is able to provide the ideal teaching style for a given subject, and since said teaching style is entirely based on the personality of the student and tutor, there needs to be a way for the website to track which kinds of people are able to work well together and learn well using certain techniques. Doing this increases the likelihood of students being satisfied with their tutors and the tutors not being burnt out from teaching students unable to understand the material in the way they present it.

The system to be is an AI-powered personality-matching algorithm that rates the student's compatibility with that of all tutors that are teaching the desired subject. Based on the results of the personality quiz and individual ratings of given tutors, the student's answers are compared with the answers of all tutors that the student searched for to create a compatibility rating out of 100 for each tutor (where 100 is full compatibility). This provides a baseline idea of which tutor is best for the student beyond the ratings given of their performance.

Problem 2. Lack of adaptive learning systems

Even with the personality test, sometimes there are intricacies that lead to students feeling off about their lessons. It could be a specific concept they have trouble understanding, or they have difficulty putting their thoughts on a topic on paper without coming off as confused. In general even with the personality quiz

some fine tuning afterwards is required to ensure that of the group of tutors with similar scores that the best choice is found eventually.

Adaptive learning technology solves this issue by evaluating the student's work over time in order to find these intricacies that are hampering the student's learning and passing on the info to both the student and tutor so they can take these adjustments into account for their next lesson and improve the student's learning. This can involve recommending different exercises on the same subject, emphasising that the tutor changes to either a more verbal, written or hands on approach to teaching as needed, recommend changes to the lesson length, and more.

Problem 3. Missing interactive elements to aid in teaching

The bare minimum needed to hold an online tutoring session is a way to contact both parties, and a video call software that connects them together for the period of time. Only having these basic functions leaves much to be desired as tutors are thus expected to provide everything else like study material, visual aids, and practice tests, with certain things like not being able to write directly on sheets being an issue that needs to be solved in some way.

To solve this interactable elements like a digital drawing board, pre-provided digital study materials, online quizzes, and exercises for certain common subjects, and both an AR and VR support feature to promote learning in a more hands-on fashion.

[3] https://www.tutorocean.com/

Problem 4. Ensuring periodic engagement from students

The best way for information to stick is for someone to be reminded about it frequently, and this should include the material students learn during their tutoring sessions. However with tutors having limited availability, making sure the students are practising in between tutoring sessions and keeping up with their use of the site is incredibly important to the student's success.

The solution is nano-learning, where small practice activities are fed to the students at a somewhat constant stream to ensure they always have at least 1 activity to do related to their tutoring sessions as practice in between large gaps in the tutor's schedule. By having these activities they function in a similar way as homework, but their smaller size and ability to be assigned at any time in between sessions will push students to be far more engaged with their work than they otherwise would be without nano-learning.

Problem 5. Higher pay cuts from the site taking away from tutors' income

The website needs to generate profit to run, as such in order to not charge a subscription fee to the students on top of tutor fees, the tutors have a cut of their pay taken as part of a commission to the site. During the market research it was found that competitor TutorOcean [2] took a static 10% pay cut from the tutor's pay.

Tutors would want there to be no pay cut at all, however shareholders and those running the site would disagree to that solution as that takes away their income. Offering a lower percentage to undercut the competition would be the easiest solution (like taking only 5%). A more involved solution would be to decrease the percentage on a tutor-by-tutor basis, based on their ratings from students and parents, and how many bookings they have on the site, with the starting cut being 10%, but decreasing as the tutor uses the site more down to as little as 3%. This incentivizes tutors to keep up a higher performance to earn more and keeps tutors on our site for longer.

| Need | Priority | Concerns | Current Solution | Proposed Solutions |
|---|---|---|---|---|
| *Lacking a personality matching algorithm* | *High* | *Errors in the personality matching cause bad fits.*<br><br>*Difficult to test without test groups of students and tutors.* | *Blindly guess from tutor bio if they're a good fit* | *Use an AI-powered personality-matching algorithm that rates the student's compatibility with that of all tutors that are teaching the desired subject.* |

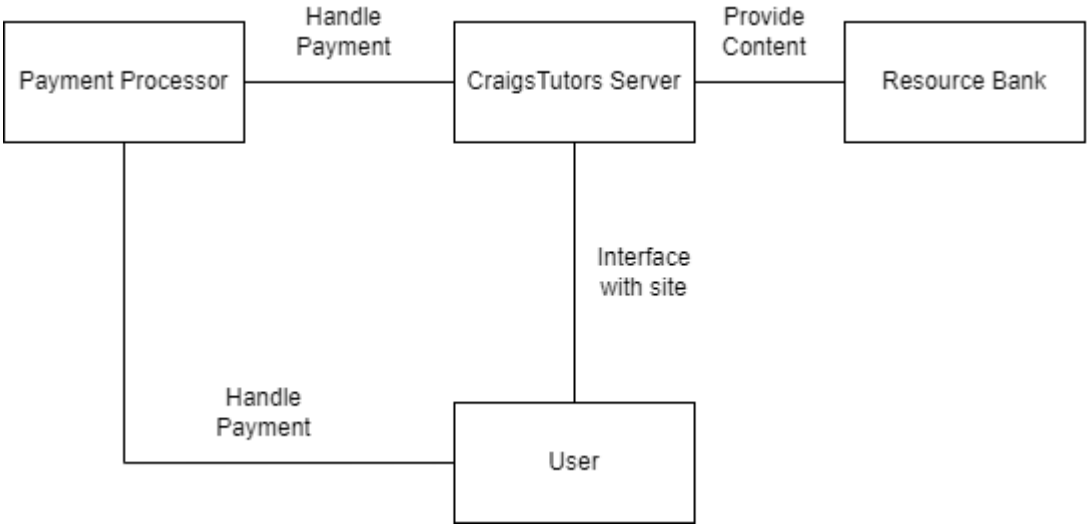
| | | | | |
|---|---|---|---|---|
| *Missing interactive elements to aid in teaching* | *High* | *Shared material must be moderated to ensure quality and correctness.*<br><br>*VR and AR are notoriously finicky to develop for.* | *Everything must be provided by the tutor, and online meetings reduce the amount they have access to dramatically* | *Provide AR and VR elements along with material, quizzes and exercises for all given subjects to aid tutors in teaching.*<br><br>*Allow the tutor to use a digital drawing board to write notes in real time for the student to view.* |
| *Lack of adaptive learning systems* | *High* | *Ensuring that the adaptive learning doesn't suggest immediate and drastic measures and only gradual adjustments so as to not overwhelm the tutor.* | *Once a student has a tutor, only the tutor can make judgements on changes to the lesson plan and accommodation s for the student.* | *The system evaluates their work in order to suggest changes for both the tutor and the student that will help them improve their learning.* |

| | | | | |
|---|---|---|---|---|
| *Ensuring periodic engagement from students* | *Medium* | *The volume of activities needs to be fine tuned so that it isn't overwhelming while still being enough to get good practice on the subject.* | *Students are not given any extrinsic motivation to work on their subject in between tutoring sessions.* | *Students are periodically given short activities to perform that increase engagement and site retention while making sure they don't neglect their practice.* |
| *Pay cuts from tutors to fund website* | *Low* | *Competitors can undercut our percentage to compete even with a lower quality service.*<br><br>*Unfair pricing will ward away tutors.* | *A set percentage is taken from the tutor's pay to fund the website.* | *Offer lower percentage than competition, or modulate percentage taken based on tutor performance.* |

# 4. Product Overview

## 4.1. Product Perspective

CraigsTutors will generally be self-contained for most features, with most processing occurring on the product's own servers, however it will interface with certain third party services, namely payment processors and resource banks, to handle payment and provide tutoring worksheets and other material, respectively. All content will be displayed via the user interface present on a separate system. Additionally, the user will be required to interface with this payment processor directly. Graphically, the system looks like so:




[2] Figure 1: Product Perspective, showing the main server, the user, the payment processor, and the resource bank, as well as connections between these main components.

## 4.2. Assumptions and Dependencies

| Assumptions | Dependencies |
|---|---|
| *All content can be viewed by the user by connecting to the website.* | *This is dependent on the user having a valid device that can connect to the internet and display the content.* |
| *The payment processor can handle the number of users that will be pushed to it due to CraigsTutors.* | *This is dependent on the internal infrastructure of the payment processor.* |
| *The resource bank has necessary resources for all the subjects that can be offered through CraigsTutors.* | *This is dependent on the chosen resource bank's internal documents.* |

| | |
|---|---|
| *The resource bank provides resources that can be displayed on the website.* | *This is dependent on the format of the files offered by the resource bank.* |
| *The user can create an account and interface with the payment processor.* | *The user has a valid bank account and payment method such as a debit or credit card that is accepted by the payment processor.* |

# 5. Product Features

## 5.1. Core Features

The primary function of the E-Academy learning site is to offer online tutoring services to elementary school children and deliver the best customer and quality service to its users. In order to maintain a user-friendly and easy-to-use platform, user types are classified into four different categories in order to allow different types of users to have access to different types of features. This was done to allow different users only to access their relevant resources, ensuring that content is beneficial to them.

The core features of the site include

**Guest View:**

1. Have access to the welcome page that includes the contact information of the team, ongoing promotions, and featured reviews (parent testimonials vouching for our service)
2. Have access to the career section in case site visitors are interested in applying to the admin team rather than becoming a tutor.
3. Have access to the featured tutors in their area (because curricula may differ).
4. Have access to the list of all courses and subjects, but cannot book for any of the sessions prior to registration. This is to ensure that guests have a good idea of the services offered, obtain the information they need as fast and as efficiently as possible and continue the registration once they are interested. In fact, having guests access to all courses and subjects gives them the

opportunity to verify first if their desired course is available and then decide whether they would like to continue with the registration or not.
5. Have access to the “About Us” section that describes the mission, vision, values, and culture of our team.
6. Have access to the information about the admin team and the general overview of all services offered to the customer. This is to ensure they have a better idea about the overall features of the site and thus make proper decisions accordingly to continue with registrations. A key thing to remember is that they don’t have access to any private contact information of tutors until they register.

**Student View:**

1. Have access to a timesheet to fill out their availabilities and according to those availabilities in order to have a list of tutors that can offer them the service.
2. Have access to an online tutoring service after being assigned to a tutor with the online sharing platform where they will upload documents, assignments, attend the sessions and view the course content.
3. Have access to the automatic personality match test feature during registration. That is in order to be assigned with the tutors that match the best with their personalities, interests, disabilities(accessible for people that have physical/mental disabilities with special accommodation as well) and language options in case they want to do the session with a specific language (such as an example that for the student it might be easier to work with a tutor who can explain in Chinese).
4. Have access to the Nano-Learning feature which is a personalized solution to students to correspond better with their specific needs. This feature consists of giving small daily quizzes to the student that take approximately 10 minutes to complete(as small daily tasks are proven to lead to better learning than long lessons. Moreover, this can let them have constant improvements and encourage them to set higher goals through the sessions. These evaluations through our unique feature will also enable parents to track their children's progress.
5. Have access to the social media platform created in order to allow students to communicate among themselves while discussing some tutoring material and help each other through active learning.
6. Have access to the extraordinary feature of the teaching platform that will be accomplished by supporting AR/VR technology. Students and tutors will be able to enter a shared environment where they will have access to a variety of simulation tools to help with the learning process.
7. Have access to the adaptive learning feature, where an automated system based on results of previous evaluations of the students might suggest

enrolling into a supplementary another tutorial session (with the same or different tutor) and therefore have an impact on their learning.

**Tutors View**

1. Have access to the same timesheet of students in order to fill out their availability. Tutors will have a User Interface(UI) displaying which student they will be tutoring at each time slot. They have the ability to set up their profile page, where they can write down their bio, add their education, experiences, strengths, languages and personality traits.
2. Have access to the same automatic personality marching test feature discussed earlier to have the chance to interact with students that they would be more comfortable working with, allowing them to be more efficient in their teaching method.
3. Have access to a massive resource bank and that is in order to help tutors teach their students better. Where they can find practice test questions, access or request textbooks, co-op learning games, subject refreshers, and teaching courses.
4. Have access to tutor-specific adaptive learning feature where in case there is some lack of understanding or poor evaluation results of students, different teaching style methods will be suggested to the tutor to implement and that is based on the student's performance. That is to say, if student evaluations show poor performance of students, the automatic system will present some feedback to the tutor and recommend other teaching styles or methods that tutors can apply for better results.

**Administrator view:**

1. Have access to the list of all tutors who apply to work. They are responsible for selecting tutor candidates and therefore be able to prepare interview tests where they can evaluate candidates and admit only those that will succeed in their roles.
2. Have access and manage government-assisted automated background checks of selected tutors (criminal/sexual offenses, education, identity, etc.).
3. Have access to all shared/user platforms including the learning platform, online sessions, social platform, and request for proper modification if needed any
4. Have the authorization to take the proper disciplinary action if a tutor gets reported by a student or parent and that is to keep the learning and social media environment safe. This is accomplished through our site feature of reviewing a flagged session. Sessions are flagged automatically through an audio and video pattern-matching algorithm or manual complaints from users.
5. Have the responsibility to manage complaints, or find quick replacements for when the assigned tutor is sick or can't be present.

6. Have the authorization to manage refund requests in case of a dissatisfied client with the service.

# 5.2. Other Product Requirements

Non-Functional Requirements

*Note that quality must be within the minimum and maximum range defined by the table below.*

| Requirement | Definition | Minimum Quality | Maximum Quality | Priority | Benefit | Stability |
|---|---|---|---|---|---|---|
| *Student Confidentiality*<br><br>*Tutor Confidentiality* | *The confidential information of students must be kept private as minors are at higher risk of online predators.*<br><br>*The confidential information of tutors is important for the physical and psychological safety of these users.* | *Meet privacy standards for all operating countries*<br><br>*(ex: PIPEDA)* | *Meet privacy standards for all operating countries*<br><br>*(ex: PIPEDA)* | *High* | *Maintains safety of users* | High |
| *Compliance* | *The student users will all be minors. Because of this we must comply with all related laws that protect children online.* | *Comply with laws from all operating countries*<br><br>*(ex: COPA)* | *Comply with laws from all operating countries*<br><br>*(ex: COPA)* | *High* | *Ensures the company is not liable for any broken laws and maintains safety of students* | High |
| *Availability* | *Service outages must not last long enough to affect students or tutors negatively.* | *2h down time* | *0 down time* | *Low* | *Increases user base's confidence* | High |

| | | | | | | |
|---|---|---|---|---|---|---|
| *(Robustness and fault tolerance)* | | | | | *in the service* | |
| *Video Performance* | *Video calls shall meet the listed KPI standards for % of HTTP error, average chunk load time, bitrate, average start load time, lag time, quality, and frames per second.*<br><br>*If usage increases past expected amounts, quality shall degrade by 1 level for at most 10 minutes while scaling occurs.*<br><br>*Video encoding shall be h.265.*<br><br>*Audio encoding shall be AAC.* | *Meets the minimum listed KPIs* | *Streams at the maximum quality and fps available with at least other minimum KPIs* | *Low* | *Increases user satisfaction for a major portion of the application service* | High |
| *Video Call Performance* | *Video calls shall meet the listed KPI standards for % of HTTP error, average chunk load time, bitrate, average start load time lag time, quality, and frames per second.*<br><br>*If usage increases past expected amounts, quality shall degrade by 1 level for at most 10 minutes while scaling occurs.* | *Meets the minimum listed KPIs* | *Streams at the maximum quality and fps available with at least other minimum KPIs* | *High* | *Increases user satisfaction for a major portion of the application service* | High |

| | | | | | | |
|---|---|---|---|---|---|---|
| | *Video encoding shall be h.265.*<br><br>*Audio encoding shall be AAC.* | | | | | |
| *VR Performance* | *VR application shall support all listed devices/platforms.*<br><br>*VR application shall be able to communicate with all listed browsers.*<br><br>*VR application shall run 1080p at 45fps when the system meets minimum requirements.*<br><br>*VR application shall run 1080p at 90fps when the system meets recommended requirements.* | *Meets the minimum listed KPIs if user has minimum device/system requirements* | *Runs at the maximum quality and fps available with at least other minimum KPIs* | *Medium* | *Ensures the application functions correctly if user has the correct hardware* | Medium |
| *AR Performance* | *AR application shall support all listed devices/platforms.*<br><br>*AR application shall be able to communicate with all listed browsers.*<br><br>*AR application shall run 1080p at 45fps when the system meets minimum requirements.*<br><br>*AR application shall run 1080p at 90fps when the system meets* | *Meets the minimum listed KPIs if user has minimum device/system requirements* | *Runsat the maximum quality and fps available with at least other minimum KPIs* | *Medium* | *Ensures the application functions correctly if user has the correct hardware* | Medium |

| | | | | | | |
|---|---|---|---|---|---|---|
| | *recommended requirements.* | | | | | |
| *Asset Serving*<br><br>*Performance* | *Serving of all assets within the scope of the application shall meet the listed KPI standards for Requests per second, error rate, average response time* | *Meets the minimum listed KPIs if user has minimum device/system requirements* | *N/A* | *High* | *Improves user experience for an aspect of the website that is used in part* | High |
| *Usability* | *All functionalities of the website shall be usable by all users without reading documentation or user guides.* | *Can use all functionality with < 2 questions in help forum* | *Don't require any questions to use all functionalities* | *Medium* | *Improves overall user experience* | High |
| *Interoperability* | *All supported/listed devices, browsers and platforms will run all functionalities without issue or extra configuration.* | *< 2 Functionalities require manual configuration to run* | *No manual configuration to run all functionalities* | *Medium* | *Improves ease of use and therefore increases overall usage* | Medium |
| *Distribution Constraint* | *Only the devices, browsers and platforms listed will support all functionalities.* | *All functionalities work* | *All functionalities work* | *Low* | *Well defined supported environment allows users to know exactly whether or not their* | Medium |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | *environment will work.* | |

[1]https://www.oberlo.ca/statistics/browser-market-share

Dependencies

The nature of this application is to work with minors. These are the types of users that are most at risk to online predators. To avoid any issues with this, our application must comply with all online child protection laws as well as in person child protection laws. As an example, in the United States of America there are a set of laws known as COPA meant to protect children from online predators. This country also has a set of laws that state that all adults working with children must do an extensive background check. As such, we would depend on these laws and regulations for any country that we have tutors or students in.

In terms of technical dependencies, this application will depend on a variety of CDN platforms, persistent cloud storage, user authentication, web browsers, operating systems and VR/AR devices/platforms. The extent to which this application depends on these will vary and has not yet been clarified because system architecture has not yet been put in place. This document should be updated as these are defined.

Platform

This includes both operating systems and browsers that are supported. Supported operating systems include Windows and MacOS for the VR and AR applications. The web application is dependent only on the web browser. Thus, any operating system that can run any of the supported web browsers is supported. The supported web browsers include Google Chrome, Firefox, Opera, Microsoft edge, Safari for the web application. These are also functional for communication with VR and AR applications. This browser support leads to a 94.94% coverage of the web user market [1]. It is also worth noting that 2.85% of the missing market is a mobile only web browser; meaning it is an uncapturable market for our application [1].

Documentation

This application seeks to provide a strong user experience. Therefore, it does not require explicit instructions or getting started manuals. Most users should be able to access all features without any assistance. However, for those that do require a nudge in the right direction, there are three options. First, is the automated help chat. This provides an answer to the most common questions in a language that is easy to understand for the user. If the automated chat is unable to answer the question, the user relates to an administrator who will be able to help the user with their specific question. There is also a more traditional FAQ page available for users that are more

comfortable with this style of help forum. Finally, there is a forum for all users to ask other users questions that are more easily answered by parents, students, or tutors.

# 6. Risk and Feasibility

As with any software project, there are inherent risks. As such, this vision document also outlines a risk management plan, along with proposed mitigation techniques, to reduce the impact of these risks. Alongside is a feasibility plan which will evaluate the project's technical, organizational, and financial feasibility.

The following are risks that have been identified for our project and their corresponding proposed risk mitigation techniques.

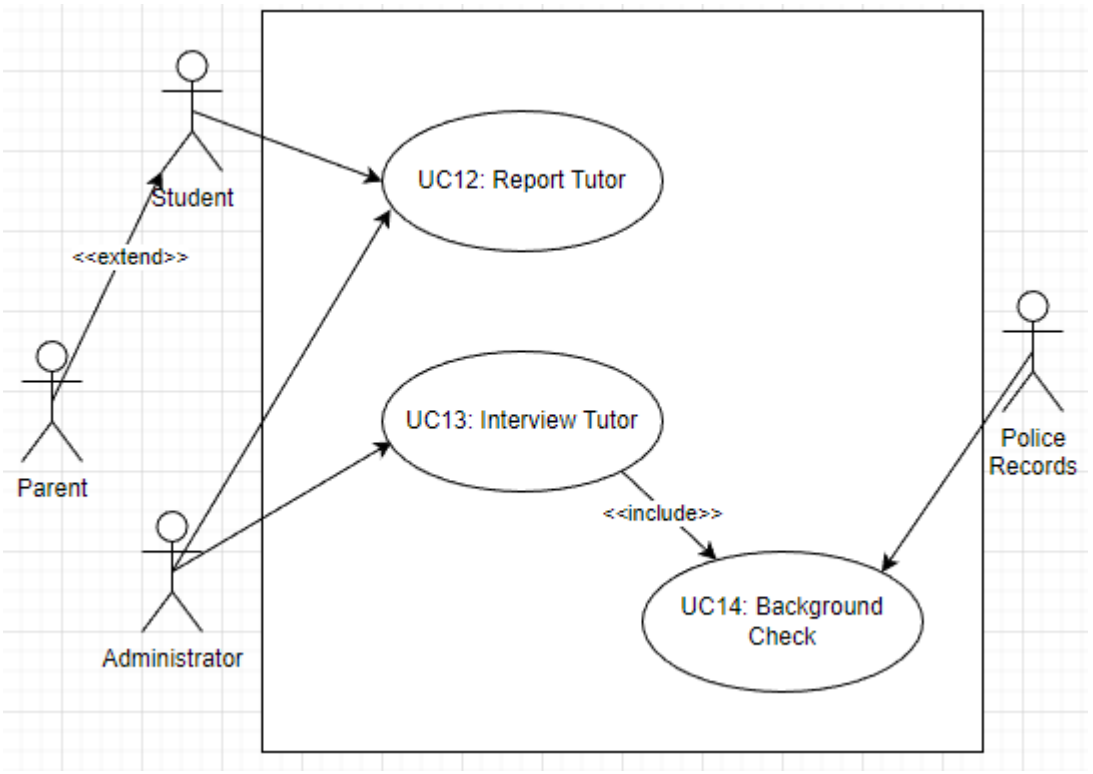
- **Process-related risks** for the project possibly include:
    - A lack of skilled tutors applying for the platform. This is easily remedied by having a robust and comprehensive screening process that ensures only tutors that have the needed teaching skills are employed. A marketing will also need to be drafted to recruit enough tutors.
    - Students may not be perceptive to the learning techniques provided. Techniques such as nano-learning may be brushed off by students who think this is just another chore. It's possible that students would just breeze through these personalized quizzes without reading them just to get over it, would cheat and find answers online just to get a high score, or not do them at all. It is imperative that tutors positively ecourage the students to answer these quizzes as it is for their own benefit. Parents will also receive feedback to help encourage their child.
    - Poor understanding of AR/VR resources by tutors. Understandably, with the technology being new, certain tutors may not be experienced in using AR/VR. As such, we will need to train tutors, certify them, and incentivize them, to use AR/VR technologies to promote it to students.
- **Product-related (domain-specific) risks** for the product possibly include:
    - Failure of content delivery networks (CDNs) that may impact our service. This can be resolved by ensuring the CDNs have redundancies such that when one fails, a backup server allows for content delivery.
    - Cybersecurity issues as a potential point of failure with sensitive personal and financial information being kept in databases. A third-party organization will need to recertify the website's systems periodically to confirm that authentication and storage systems are secure and are not vulnerable to attacks.
    - Failure of AR/VR modules to work properly on different systems. For a problem like this, there needs to be extensive testing to ensure the

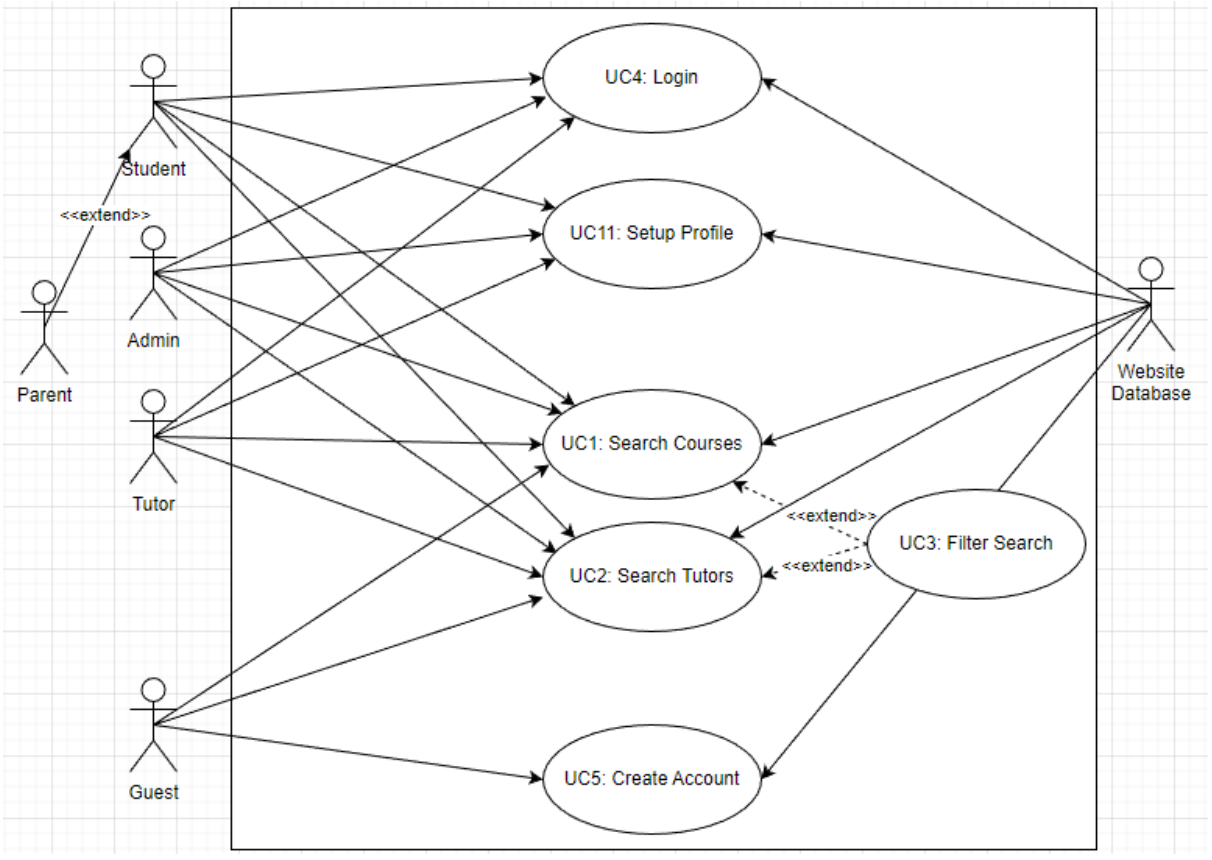
responsiveness of AR/VR modules working with different hardware under different software and OS versions.

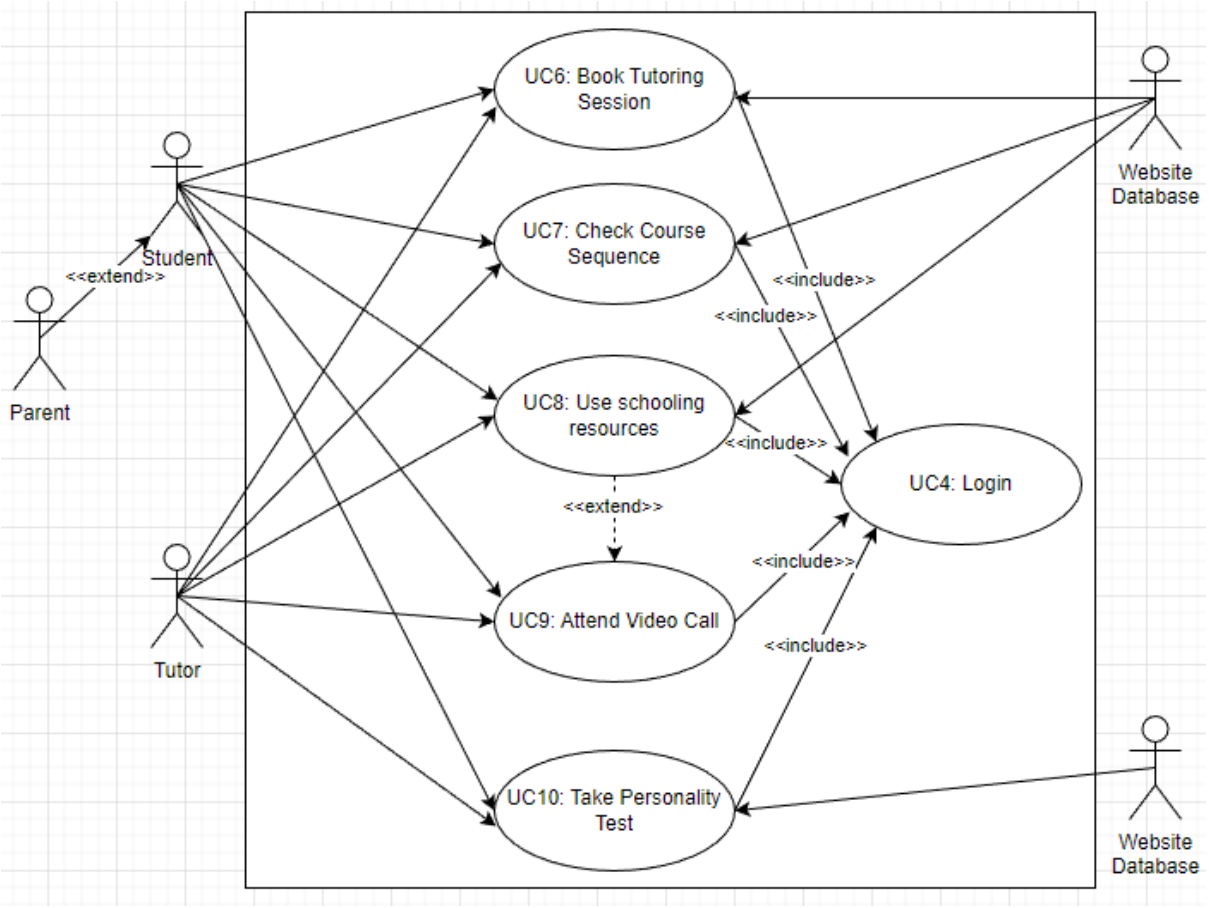
In terms of feasibility, we evaluated our project under the following domains:

- **Technical**. Though the platform uses novel technologies such as AI and AR/VR, these technologies have already carved out a space in the tech industry. Being one of the tutorial websites on the Internet to offer such services allows the business to gain an initial foothold should these technologies boom. Initially, the AI-model will need to be trained properly with data sets to allow for robust predictions between tutor and student compatibility. This will require developers knowledge in machine learning and artificial intelligence, something the Montreal tech community is known for. There also needs to be developers knowledgeable in creating AR/VR software to provide for content utilizing these technologies. With a large pool of gaming companies in Montreal, there will be an abundance of developers familiar in this field. In terms of time, given that it's only a small subset of AR/VR and AI technology being developed, both being not highly complicated, time will not be an issue in development. Issues will only arise when delays occur during the development phase.
- **Organisational**. Personnel-wise, the platform does not require a large pool of personnel. Initially, however, developers will be required to construct the AI-matching system and the AR/VR modules but with Montreal being a major tech hub, it will not be difficult to recruit talented developers. If there continues to be a lack of skilled developers, then recruitment can be turned globally, or outsourced. When the project is live, administrators, IT support, and content managers will be required to keep the site running; but, the bulk of the personnel are tutors who are contractual in nature. Other stakeholders, such as the students and their parents will be managed and served by administrators to make sure they receive a positive experience. This small organisational size makes for a very practical company structure.
- **Financial**. Given that in the post-pandemic era where online and hybrid classes have become more accepted, the platform is expected to generate a good revenue stream from students who are finding the online platform at school difficult. The presence of tutors guarantees that lessons are reinforced and any misunderstood lessons are re-explained. This will naturally generate interest for online tutorial lessons, and coupled with proper marketing, will increase the demand for the service.

# 7. Use Case Diagram






[2] https://www.draw.io/index.html

Use Case Schema Details:

| | | |
|---|---|---|
| Use Case UC1 | | Search Courses |
| Related Requirements | | User should be able to search through the list of courses |
| Initiating Actor | | Any of: Student, Admin, Tutor, Guest |
| Actor's Goal | | Find the courses offered |
| Participating Actor | | Database |
| Preconditions | | List of courses in database is not zero |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User accesses website and searches for a specific course |
| ← | 2. | The specified course is returned to the user |
| Flow of Events for Alternate Scenario | | |
| | 1a. | The searched course is not in the database |
| ← | 1. | Return message informing user that the course is not offered |

| Use Case UC2 | | Search Tutors |
|---|---|---|
| Related Requirements | | User should be able to search through the list of tutors |
| Initiating Actor | | Any of: Student, Admin, Tutor, Guest |
| Actor's Goal | | Find the tutors available |
| Participating Actor | | Database |
| Preconditions | | List of tutors in database is not zero |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User accesses website and searches for a specific course |
| ← | 2. | The specified tutor is returned to the user |
| Flow of Events for Alternate Scenario | | |
| | 1a. | The searched tutor is not in the database |
| ← | 1. | Return message informing user that the tutor is not offered |

| Use Case UC3 | | Filter Search |
|---|---|---|
| Related Requirements | | User should be able to search through the database more easily based on specified filters |
| Initiating Actor | | Any of: Student, Admin, Tutor, Guest |
| Actor's Goal | | Find the information available |
| Participating Actor | | None |
| Preconditions | | None |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User accesses website and gives specific search filters |
| ← | 2. | The filters return specific data to the user |
| Flow of Events for Alternate Scenario | | |
| | 1a. | The search filters do not return something in the database |
| ← | 1. | Return message informing user that the filter is invalid |

| Use Case UC4 | | Login |
|---|---|---|
| Related Requirements | | Non-guest users should be able to log on to the website |
| Initiating Actor | | Any of: Student, Admin, Tutor |
| Actor's Goal | | Log on to access website resources not offered to guests |
| Participating Actor | | Website Database |
| Preconditions | | User must have an account saved |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User enters their login credentials |
| ← | 2. | The website verifies the user is in the database and gives access to the website to the user |
| Flow of Events for Alternate Scenario | | |
| | 2a. | User's credentials are not found in the database |
| ← | 1. | Return error message indicating there was an error while logging in |

| Use Case UC5 | | Create Account |
|---|---|---|
| Related Requirements | | Guest users should be able to create an account on to the website |
| Initiating Actor | | Guest |
| Actor's Goal | | Create an account |
| Participating Actor | | Website Database |
| Preconditions | | Account information must not be already in use |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User enters their new account credentials |
| ← | 2. | The website verifies the user is not in the database and logs in the user |
| Flow of Events for Alternate Scenario | | |
| | 2a. | User's credentials are found in the database |
| ← | 1. | Return error message indicating the information is in use by another account |

| Use Case UC6 | | Book Tutoring Session |
|---|---|---|
| Related Requirements | | Students, parents, and tutors must be able to schedule tutoring sessions |
| Initiating Actor | | Student or Tutor |
| Actor's Goal | | Schedule a tutoring session |
| Participating Actor | | Website Database |
| Preconditions | | Both tutors and students need availability during the scheduled time |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User enters a time slot when they wish to have a tutoring session |
| ← | 2. | Website returns a confirmation of session as well as a reminder to the other party involved |
| Flow of Events for Alternate Scenario | | |
| | 2a. | User enters a time slot where the other party is unavailable |
| ← | 1. | Website does not allow booking and displays error message to the user |

| Use Case UC7 | | Check Course Sequence |
|---|---|---|
| Related Requirements | | Students, parents, and tutors must be able to check the course sequence |
| Initiating Actor | | Student or Tutor |
| Actor's Goal | | Check Course Sequence |
| Participating Actor | | Website Database |
| Preconditions | | None |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User searches through the course sequence in order to inform themselves of information to come in future sessions |
| ← | 2. | Website returns a course sequence to the user |

| Use Case UC8 | | Use schooling resources |
|---|---|---|
| Related Requirements | | Students, parents, and tutors have access to a plethora of schooling resources to help with learning |
| Initiating Actor | | Student or Tutor |
| Actor's Goal | | Access and use schooling resources |
| Participating Actor | | Website Database |
| Preconditions | | None |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User access schooling resources in order to help the understanding of the subject matter |
| ← | 2. | Website returns all the schooling resources to the user |

| Use Case UC9 | | Attend Video Call |
|---|---|---|
| Related Requirements | | Students, parents, and tutors should be able to interact with each other through video calls for tutoring or course-related meetings |
| Initiating Actor | | Student or Tutor |
| Actor's Goal | | Video call between tutor and student and/or parent |
| Participating Actor | | None |
| Preconditions | | None |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User joins video call and meets with the other party |
| ← | 2. | Website displays other party's video footage |

| Use Case UC10 | | Take Personality Test |
|---|---|---|
| Related Requirements | | Students and tutors take a quick personality test in order to ensure that students and tutors are matched to suit their needs and desires |
| Initiating Actor | | Student or Tutor |
| Actor's Goal | | Complete personality test |
| Participating Actor | | Website Database |
| Preconditions | | None |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User enters information by answering the test's questions |
| ← | 2. | Website Database stores the information to be compared later |

| Use Case UC11 | | Setup Profile |
|---|---|---|
| Related Requirements | | Users should have a profile which contains their login information as well as other pertinent data about their role with Craigstutors |
| Initiating Actor | | Any of: Student, Admin, Tutor |
| Actor's Goal | | Create and manage a user profile |
| Participating Actor | | Website Database |
| Preconditions | | None |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User updates and sets their personal information |
| ← | 2. | Website Database stores the information given |

| Use Case UC12 | | Report tutor |
|---|---|---|
| Related Requirements | | Students and administrators should be able to report tutors if they behave in a disorderly fashion |
| Initiating Actor | | Student or Administrator |
| Actor's Goal | | Report Tutor |
| Participating Actor | | None |
| Preconditions | | None |
| Postconditions | | None |
| Flow of Events for Main Success Scenario | | |
| → | 1. | User reports tutor of disorderly conduct |
| ← | 2. | Website gives message confirming report to user |
| ← | 3. | Report is sent to an administrator to be dealt with accordingly |

**Github Link if needed:https://github.com/JamesPartsafas/soen342**