

PROJECT REQUIREMENTS

A. Functional Requirements

A.1 User Services Requirements

*Users shall be able to access two options, main and subcategories when uploading a video.

*Users shall be able to watch video content with maximum 1080p, and have 360p,480p,720p,1080p options.

*Users shall be able to watch videos based on their internet speed, so auto quality changer shall be implemented.

*Users shall be able to continue the video from where they left.

*When users stop watching at video's last 30 seconds, videos shall count as finished.

*Users shall easily navigate with slugs introduced on course categories and subcategories.

*The guest user shall not be able to watch free or paid videos.

*The guest user shall just navigate the whole website, and search courses.

*The unsubscribed user shall be able to watch only free videos.

*The subscribed user shall be able to watch all lecture videos.

*The subscribed user shall be able to take the test after completing to watch the videos.

*Users shall be able to view videos at full screen.

*Users shall be able to increase video speed at will.

*Videos shall automatically change to the next lecture of the course.

*To ensure adaptive bitrate, the HLS system shall be introduced.

*Users shall be able to see the popular contents of the website.

*Users shall continue to use the system until the end of the subscription period, after canceling his/her subscription.

*Users shall be able to search for courses by entering the query in the search box in the top navigation bar.

- *Users shall be able to navigate through two main categories. Clinical sciences and fundamental sciences.
- *Users shall be able to see narrated studies in subsections to better understand what to expect in the following subject.
- *Course pages shall include a description of the course.
- *Course pages shall list main course headlines as items.
- *Course pages shall display the total duration of the course.
- *Course pages shall display a number of lectures of the course.
- *Course pages shall list lectures of the course as a playlist.
- *Course pages shall have a cover photo.
- *Video player shall have a mute button.
- *Lecture pages shall have a sidebar showing the list of lectures for the course as a playlist.
- *Lecture pages shall have a breadcrumb at the top of the page for easier navigation.
- *Top navigation shall have a menu of courses and categories, preferably as a mega menu.
- *Top navigation shall have a link to subscription packages.
- *Top navigation shall have Login and Register buttons when the user is not logged in.
- *Top navigation shall have a welcome and username shown when the user is logged in.
- *When clicked on the welcome username button on the top navigation, a drop-down menu with items My Account and Logout should be shown.
- *Lecturers shall be able to ask questions to students, using a link on lecture pages. Clicking the link opens up a modal window with a message text field and previous text exchange listed above.
- *Lecturers shall be able to add questions per lecture or course.

A.2 System Security Requirements

- *The user shall be active in one session at a time. More than one session shall not be allowed to ensure the same subscriber uses the system at a time.

*UId code shall be implemented to prevent rival companies from seeing the amount of courses system introducing.

*There should be a monthly watch limit in case of a shared account.

*Users shall have their passwords include at least an uppercase character and a number to ensure security.

A.3 Administration Requirements

*Admin profiles shall be created. These profiles shall have different privileges based on their role; such as admin,editor,financial director... etc.

*Instructors shall have access to their respective administration panels.

*Instructors shall be able to upload files with videos.

*Video streaming shall be available for teachers.

*Customers shall be able to reach the support module.

*Users shall be able to open tickets for their problems.

*Administrator shall be able to manage user accounts from their administration panel.

*User addition and deletion panels shall be introduced.

*User video statistics shall be accessible.

*Tracking of membership and reporting options shall be available to the administration.

*Administrator shall be able to define subscription packages.

A.4 Legal Requirements

*Clarificatication text shall be announced in a tab.

*Cookie policies shall be announced in a tab.

*GDPR/KVKK regulations shall be enforced.

*Users shall be able to access policy texts using the links in the footer from any screen of the website.

A.5 Account Management Requirements

*Users shall be able to register with one of the suitable payment services.

*Subscription modules shall have payment packages such as a 3-month, a 6-month, and 1-year subscription.

*Users shall be able to get personal discounts based on their respective institution and shall be able to use it in the system.

*Users shall be able to add multiple subscriptions to their account. (Example, 3 months left on subscription, user purchases another 3-month subscription to increase it to 6)

*The user shall be able to register to the system by entering a username, password, name, and surname.

*The system shall send a confirmation link to the user after the user enters user credentials. To complete the registration phase, the user shall confirm the link.

*The user shall enter school and graduation date optionally when registering to the system.

*The user shall be able to login to the system entering an email address and a password.

*Users shall be able to verify their coupon codes on site.

*Usage of multiple coupons shall be restricted.

*An e-mail or SMS verification system shall be introduced for new registers to verify.

*When a user logs in, the system shall navigate to the homepage.

*Users shall be able to change their personal information in their account settings.

*Users shall be able to change their passwords in their account settings.

*Users shall be able to change their payment plans in their account settings.

*Users shall be able to track their transaction history inside their account settings.

A.6 Technical Requirements

*User interface shall be arranged via VueJS.

*Administration panel shall be arranged via Python and Django.

*Via Django-Restful API libraries a new user interface shall be designed.

*Open source alternatives of libraries shall be preferred when needed.

- *Software to be shall use RDBMS for storing the data.
- *Software to be shall use PostgreSQL as the RDBMS.
- *Software to be shall use Python as the language and interpreter.
- *Software to be shall use Django as the Python Web Framework.
- *Software to be shall use Restful Web Services for data exchange with the front end.
- *Software to be shall use the VueJS framework with JavaScript as the programming language.
- *Software to be shall use Nuxt as a higher framework for the VueJS.
- *Software to be shall use HTML5 based video players, preferably open source one and Google-backed Shaka Player as the priority.

B. Non-Functional Requirements

B.1 Portability Requirements

- *Course videos shall be viewed from multiple operating systems including Microsoft Windows, macOS, and Linux.
- *Course videos shall be viewed on modern web browsers such as Google Chrome or Firefox.

B.2 Usability Requirements

- *The system interface shall be simple so that new users adapt to the system easily.
- *The system shall be easy to learn so that new users can understand and remember effortlessly.
- *The language of the interface shall be formal and polite.

B.3 Reliability Requirements

- *User data shall be backed up so that the data can't be lost.
- *Uptime shall be 99.99% in a year.
- *Videos shall be stored on Amazon AWS S3 Cloud Storage to ensure that data is secure from any data storage failure.

B.4 Safety Requirements

- *User data shall be protected with the data protection law in Turkey.

*User data shall not be shared with third parties.

*Customer credit or debit card information entered during the payment process shall not be saved.

*Credit card information shall be directly transferred to one of the payment services because of legal regulations.

*Video download option shall not be available to prevent illegal distribution.

*Fingerprint/watermark shall be added to track the subscriber, in case the video is illegally downloaded or distributed.

B.5 Security Requirements

*Database authentication credentials shall be strong to protect access to data.

*User shall be able to see the login history in his/her account. The system shall record the time and the device when login, so that the user can check them.

*User shall be able to request a temporary password if s/he forgets it. The system shall send a link to the user's email address.

*Lecture files shall be processed through the application code for better control of the authenticated access to files.

*Software shall log out inactive users automatically.

B.6 Performance Requirements

*The system shall support many users simultaneously so that users shall be able to use the system at the same time.

*The system shall be capable to handle 100.000 users at a time without affecting its performance.

*System response time shall be less than 3 seconds 98% of the time.

*Variation in system response time shall be avoided.

*All course videos shall be loaded in less than 2 seconds.

*Probability of failure shall be 1 out of 100.000 plays when the user plays a course video.

*Website performance shall not be affected negatively, in case there is a corporate membership registration.

*Software shall use query caching of the RDBMS (Postgresql) for better performance.

*Videos shall be served from a CDN system, Amazon CloudFront.

B.7 Maintainability Requirements

*When upgrading the system, all website content and settings shall remain unchanged.

*System admin shall be able to make content adjustments without system developer's assistance.

*During maintenance routine software shall not be shut down except service restarts.

*A planned maintenance shall be able to be announced through the webpage using a modal alert box, or by emailing users prior.

*Each library update shall be done on a test server first and if tests pass, then applied to the production server.

*Error logging and reporting service shall be added to the software, preferably Sentry.

B.8 Accessibility Requirements

*Emails shall be sent through a mailer service to ensure not falsely marked as spam by the client mail service, so the user receives all emails.

*All courses shall provide a text version of the audio content so that the content shall be more accessible.

*Few specific videos shall be available as free so that unsubscribed users can understand the content of the course.

*Special discount coupons or codes shall be provided for individual users or corporations.

*Universities shall be provided with special discounts.

C. Glossary

Transcoding - Encoding a video to another resolution and/or bitrate

Encoding - Converting a video to a specific format using a codec

Upscaling - Encoding a video to a higher resolution using interpolation.

Video Bitrate - Property of a video file, mostly defining the quality of the video by bits per second. Higher quality videos with either higher resolution and/or more details have a higher bitrate

Video Resolution - Video image size in height and width, in pixels

Signed Cookies - Browser cookies are encrypted with a private key to ensure that data stored and passed in the cookie is not tampered by the user or a third party

Adaptive Streaming - A method of video streaming where users or software can select the resolution or bitrate of the playing video, among served streams. Video is split into smaller segments to easily switch between streams.

ABR - Adaptive Bitrate - Another naming and abbreviation for Adaptive Bitrate Streaming

Video on Demand (VOD) - Video distribution is done at user request and per user basis.

Video Streaming - Video data is streamed from the network, concurrently while playing.

DASH / MPEG DASH - HTTP based adaptive video streaming standard by MPEG

HLS - HTTP Live Streaming - Proprietary ABR technology similar to DASH, created and owned by Apple to provide ABR video streaming

AWS - Amazon Web Services - Amazon-owned cloud services

ETC - Elastic Transcoder - Amazon AWS' video transcoding service

CDN - Content Delivery Network - Geographically distributed network of servers to allow quicker access and provide high availability

CloudFront - Amazon AWS' CDN service

Video Player - software that plays and shows video on the screen, with some controls

Shaka Player - An open-source video player by Google.