



IO2 Roadmap

IO2A4 Technological Roadmap



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Layout

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1 Introduction

The ApprenticeTrack application will provide a platform for tracking apprenticeship programs. It will enable a faster workflow for apprenticeship administrators and a better overall experience for students, mentors and apprenticeship organisers during apprenticeship.

It will serve as a centralized repository for all documents regarding the apprenticeship and simplify the administration workflow before the apprenticeship takes place. All parties (students, mentors, professors/apprenticeship organisers and school administrators) will be able to access the documents regarding the apprenticeship and can modify them. This would be done either by modifying them in the application itself (ideally) or downloading and uploading them to the application. Each change will be audited, so that a trail of changes is recorded.

To simplify the use of the application as much as possible, it will be delivered as a web application. That way ApprenticeTrack can be accessed regardless of the platform (Windows, iOS, Android, ...) the user is using to access it. It also reduces development time as only one service must be maintained.

The application will enable integration with already existing School Information Systems (SIS) or be able to work in standalone mode. A use case for such integration will be connecting an already existing student database with ApprenticeTrack via the ApprenticeTrack authorization protocol. If multiple schools/SISs are connected to ApprenticeTrack, the application will prompt the user to choose the correct school/SIS when authenticating.

ApprenticeTrack will also include a reporting component to generate reports regarding apprenticeships. These can also be used to issue a certification of completed apprenticeship to students that successfully finish their apprenticeship.

2 Processes

2.1 Accessing AppTrack

Name	Accessing AppTrack
Description	ApprenticeTrack application (AppTrack) users access the application by logging into School Information System (SIS), which redirects them to AppTrack.
Actors	<ul style="list-style-type: none"> • Students, professors/apprenticeship organisers, mentors from employers • SIS administrator • AppTrack administrator
Pre-Conditions	<ul style="list-style-type: none"> • Users must be registered in SIS. Each user must have a login username and password. These are provided by SIS administrator. • Working SIS and AppTrack systems.
Basic Flow	<ol style="list-style-type: none"> 1. User logs into SIS and launches AppTrack 2. AppTrack establishes communication with SIS via ApprenticeTrack Authorization Protocol (v0.1) 3. AppTrack authenticates the user via Apprentice Track Authorization Protocol 4. The user is given access to content made available to him by SIS administrator (refer to the image below) <p>The diagram illustrates the data flow between the School Information System (SIS), the AppTrack application, and various users. SIS acts as a central data repository, sending data to AppTrack and receiving data back. AppTrack then distributes this data to users and receives input from them. The users involved are the apprenticeship coordinator (PHEI) professor, the student, and the mentor.</p> <ul style="list-style-type: none"> SIS to AppTrack: student data, apprenticeship coordinator data, existing employer and supervisor data, instructions for the apprenticeship. AppTrack to SIS: new employer and supervisor data, contract, reports (of the supervisor, student and employer), final grade, filled out surveys (by the student and the employer). AppTrack to Users: <ul style="list-style-type: none"> Apprenticeship coordinator: new employer and supervisor data, contract, final grade. Student: instructions, existing employer and supervisor data. Mentor: instructions, filled out survey, report and assessment. Users to AppTrack: <ul style="list-style-type: none"> Apprenticeship coordinator: contract. Student: filled out application for apprenticeship, report, filled out survey. Mentor: filled out survey, report and assessment. <p>Additional elements include 'database management' between SIS and PHEI, and a 'contract' flow between the coordinator and the student.</p>
Post-conditions	User finishes work and logs out, which terminates AppTrack session All data is stored in SIS database.

2.2 Workflow: Student — AppTrack

Name	Workflow: Student — AppTrack
Description	Students use AppTrack for finding apprenticeship offers, materials and instructions regarding their apprenticeship and other administrative work.
Actors	<ul style="list-style-type: none"> • Students • Professors/apprenticeship organisers • Mentor
Pre-Conditions	<ul style="list-style-type: none"> • Student has an active SIS account • Professor/apprenticeship organiser has an active SIS account
Basic Flow	<ol style="list-style-type: none"> 1. Student finds an enterprise to do apprenticeship at 2. Student checks if the enterprise is already available in AppTrack <ol style="list-style-type: none"> a. If enterprise is not available, the student contacts the professors/apprenticeship organisers to make necessary arrangements with the enterprise 3. Student submits “Application for practical training” form to professors/apprenticeship organisers 4. Student signs the contract 5. Student gets apprenticeship materials/instructions from mentor in AppTrack 6. Student proceeds with apprenticeship, during which they fill out “Journal of practical training” in AppTrack and can view mentor’s weekly reports 7. After the apprenticeship student submits the final report 8. Student fills out the survey 9. Student takes the exam <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center; margin: 0;">STUDENT</p> <pre> graph TD Start(()) --> A[view available documents in the module (instructions, list of enterprises existing in the database)] A --> B{ } B --> C[select an enterprise that already exists in the database] B --> D[select a new enterprise] C --> E[fill out the "Application for apprenticeship" form and upload it to the module] D --> E E --> F[administrative work is done by the apprenticeship coordinator] F --> G[sign the contract] G --> H[APPRENTICESHIP] H --> I[prepare and upload the final report] I --> J[fill out survey] J --> K[exam] K --> L[the final grade is available to view in the module] L --> End(()) </pre> </div>
Post-conditions	The final grade is made available to student in AppTrack after completing the apprenticeship.

2.4 Workflow: Mentor (employer) — AppTrack

Name	Workflow: Mentor (employer) — AppTrack
Description	Mentors use AppTrack for checking students work during apprenticeship, communication with professors/apprenticeship organisers and administrative work required by the school
Actors	<ul style="list-style-type: none"> • Mentor • Students • Professor/apprenticeship organiser
Pre-Conditions	<ul style="list-style-type: none"> • Mentor has an active SIS account • Student has an active SIS account • Professor/apprenticeship organiser has an active SIS account
Basic Flow	<ol style="list-style-type: none"> 1. Mentor reads the apprenticeship documentation provided by the professor/apprenticeship organiser in AppTrack 2. During apprenticeship mentor follows student’s journal entries 3. Mentor writes weekly reports on student’s work and communicates with the professor/apprenticeship organiser 4. After apprenticeship mentor fills out the final assessment form (“Mentor’s report within the organization on the progress and implementation of PT”) 5. Mentor fills out the survey <div style="text-align: center;"> <pre> graph LR Start(()) --> A[sign the "Application for apprenticeship" form] A --> B[receive credentials to access the module from the apprenticeship coordinator] B --> C[sign the contract] C --> D[APPRENTICESHIP (mentor can already access and fill out the assessment form in the module during this time)] D --> E[fill out the final assessment form in the module] E --> F[fill out survey] F --> End((())) </pre> </div>
Post-conditions	Mentor receives feedback about apprenticeship from the professor/apprenticeship organiser

2.5 Adding data to Database in AppTrack

Name	Adding data to Database in AppTrack
Description	School administrator or professor/apprenticeship organiser adds data about companies, which offer apprenticeship to their students. Data is added for each study program and module and includes all apprenticeship documentation.
Actors	<ul style="list-style-type: none"> • School administration • Professor/apprenticeship organiser
Pre-Conditions	<ul style="list-style-type: none"> • Apprenticeship documentation is available. • All data about the company is available
Basic Flow	<ol style="list-style-type: none"> 1. School administrator adds the following data about a company: <ul style="list-style-type: none"> • name for the company, • address, • company contact information (person, phone, email) • type of apprenticeship offered, • mentor contact information 2. Each study program and module contain the following documentation: <ul style="list-style-type: none"> • Contract sample, • Mentor instructions, • Student instructions, • List of required skills, • Mentor scorecard, • Student scorecard, • Mentor evaluation survey.
Post-conditions	<p>Company is added to the system and is available for student to choose an apprenticeship. Student contacts the company with contact information from the system and sets up the apprenticeship.</p> <p>Program and module documentation are available to students and mentors.</p>

2.6 Student chooses apprenticeship

Name	Student chooses apprenticeship
Description	<p>Student chooses available apprenticeship offer from one of the companies already in the system and contacts them to set up apprenticeship.</p> <p>Student can request a new company to be added to the system. Professor/apprenticeship organiser checks the requirements and if compliant adds the company to the system</p>
Actors	<ul style="list-style-type: none"> • Student • Professor/apprenticeship organiser • Mentor
Pre-Conditions	<ul style="list-style-type: none"> • Mentor has an active account • Student has an active account • Professor/apprenticeship organiser has an active account
Basic Flow	<ol style="list-style-type: none"> 1. Student chooses a company for apprenticeship and contacts it via e-mail or phone to set up the apprenticeship 2. Student can add their CV to the system and send it to the company. 3. Student successfully sets up apprenticeship with the company and informs the professor/apprenticeship organiser <ol style="list-style-type: none"> a. If company is not yet in the system student requests the company to be added b. Professor/apprenticeship organiser checks if company is compliant with requirements for offering apprenticeships c. Professor/apprenticeship organiser adds the company to system 4. Professor/apprenticeship organiser checks the company if applicable for study program and module and prepares the contract 5. All three parties sign the contract 6. Contract is uploaded to the system
Post-conditions	<p>Student, professor/apprenticeship organiser and mentor have access to the contract and other documents relating to apprenticeship.</p>

2.7 Workflow: Apprenticeship

Name	Workflow: Apprenticeship
Description	During apprenticeship student, mentor and professor/apprenticeship organiser can follow the student's progress and contact each other using AppTrack's messaging system.
Actors	<ul style="list-style-type: none"> • Student • Professor/apprenticeship organiser • Mentor
Pre-Conditions	<ul style="list-style-type: none"> • Contract signed by all three parties
Basic Flow	<ol style="list-style-type: none"> 1. Student and mentor must read through their respective instruction materials 2. During apprenticeship student and mentor fill out "Progress reports" which should generate a report at the end of each week. This report is delivered to mentor via an e-mail and is available in AppTrack for viewing. 3. For each student's competence mentor enters progress entry; describes the work, actions and whatever things student and mentor have done in order to increase particular competence <ol style="list-style-type: none"> a. Progress filed can be added to each week, so at the end mentor has the progress report ready b. A general field is available for entries where work doesn't apply to any offered competence 4. Student can see how mentor scores their progress 5. Professor/apprenticeship organiser can follow report progress 6. Professor/apprenticeship organiser can visit the student at their apprenticeship 7. All involved parties can communicate using the AppTrack messaging system
Post-conditions	Apprenticeship is finished and Evaluation report is prepared

2.8 Evaluation after apprenticeship

Name	Evaluation after apprenticeship
Description	After finished apprenticeship an Apprenticeship Evaluation Report is prepared. This is done by both mentor and student.
Actors	<ul style="list-style-type: none"> • Student • Professor/apprenticeship organiser • Mentor
Pre-Conditions	<ul style="list-style-type: none"> • Student finished apprenticeship
Basic Flow	<ol style="list-style-type: none"> 1. Mentor finalizes progress report, if not completed during apprenticeship 2. Mentor submits mentor report (scorecard) where he/she rates the student and uploads the file to system. 3. Mentor submits mentor evaluation survey 4. Student submits student report (scorecard) where they rate the mentor and the company and uploads the file to system
Post-conditions	Mentor and student upload all required documentation in the system.

2.9 Grading the student and Apprenticeship exam

Name	Grading the student and Apprenticeship exam
Description	Professor/apprenticeship organiser checks all submitted reports and grades the student
Actors	<ul style="list-style-type: none"> • Student • Professor/apprenticeship organiser
Pre-Conditions	<ul style="list-style-type: none"> • Submitted mentor and student reports.
Basic Flow	<ol style="list-style-type: none"> 1. Professor/apprenticeship organiser checks all submitted reports. 2. Student takes the apprenticeship exams as required by school program or module 3. Professor/apprenticeship organiser finishes the apprenticeship exam and grades the student (1-10). 4. Students grade is entered in the system which is integrated with SIS or SIS directly if AppTrack is in standalone mode
Post-conditions	Student successfully finishes apprenticeship course.

3 Testing

Prototype testing will be done in three phases:

Phase 1: testing on VERN servers

Phase 2: testing on local servers in each country

Phase 3: testing during the Multiplier Event in September 2020 with 15 participants (5 students, 5 mentors, 5 professors/apprenticeship organisers)

The JIRA tool will be used by the experts while testing the prototype in order to report any bugs, issues or functionalities they experience in the prototype.

3.1 Phase 1: testing on VERN servers

Application will be deployed in a limited environment on VERN servers. Each of the partners will have access to the application, where they will test the functionality of the application and report any bugs and provide feedback. This feedback will be used to fix any major issues before proceeding with phase 2 of testing.

3.2 Phase 2: testing on local servers in each country

After phase 1 is successfully finished, each of the partners will deploy the application on their servers in their environment. In this phase of testing partners will integrate the application with their School Information System (SIS) using the ApprenticeTrack authorization protocol or deploy the application in standalone mode without integration.

Testing in phase 2 is done in the staging environment, which is similar to final production environment, so any issues integrating with local SIS systems can be reported and fixed.

During phase 2 each of the partners will also start the process of translating the application in their respective language (English, Croatian, Czech and Slovenian).

3.3 Phase 3: testing during the Multiplier Event

Phase 3 will be the final phase of testing the prototype. It will be a small-scale deployment in production environment. The Multiplier Event will include 15 users, 5 of each “user type”. These are students, mentors and professors/apprenticeship organisers. The goal of this phase is to see the performance of the application and get feedback from users who will use the application.

After testing in phase 3 is finished, each partner will write a report on the Multiplier Event.

When final reports are delivered and before the application is ready for launch, a set of video instructions will be created for mentors, students and professors/apprenticeship organisers. These will show how to use the application.

4 Future Development

Current goal of this project is for all the partners to use the application in their production environment. At this point the frontend of the application supports only username and password credentials for logging into the system.

In the future the application could allow digital signing of contracts. This would be done in partnership with an outside institution, which can issue a certificate that is recognized as official on a national level.

The institution which hosts the application server would have to comply with national and GDPR regulations for secure data storing (any documents that are signed by a digital signature) and personal information.

All of this would increase the cost of maintaining the application. Cost increase would be different for on each country due to different local compliance regulation and commercial availability of secure hosting providers.

About the Apprenticeship Track Project

Apprenticeships allow students to build up skills and knowledge, while providing companies with a reliable way to evaluate potential future hires and the benefit from fresh perspectives offered by academia. Despite their advantages, apprenticeships are challenging to manage, as the needs of students and of specific enterprises are difficult to match, particularly when organizations need to deal with massive amounts of students and, consequently, data. Structured communication channels between enterprises and students, robust management systems and clear evaluation protocols are necessary to manage such a complex system, are therefore needed to enable the launch of valuable, steady and sustainable Apprenticeship Programmes.



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