DELIVERABLE REPORT

COMPLEAP

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Project name: Learner-centred digital ecosystem of competence development
(Compleap)
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Work package: WP2
Title: Deliverable No 18: Detailed description of the user scenarios with guidelines
and advice for developers in WP3
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Summary of Updated Report

This updated deliverable describes the background on how the CompLeap framework architecture
has been developed, why the selected components are part of it, and how they link together.
Thereafter the report details the progress made with the selected users, the roadmap from the
users needs towards the creation of the framework, the user scenarios depicted in the
architecture work, as well as the details of the workshops held in order to collect needs of the
poteantial users of the service ecosystem.

The Upodated deliverable not only presents the key architecture image but also describes the
background as well content and use cases. Similarly, the user scenarios and user profiles, as well as
how they have come into being and have been updated is detailed.

Finally, also the original deliverable is included as the last section for reference.

DESCRIPTION OF COMPLEAP USER SCENARIOS AND GUIDELINES PROVIDED FOR DEVELOPERS IN WP3

Contents

1 Introduction

The CompLeap project team has chosen to adopt an iterative service design method whereby the guidelines for developers have been compiled and gathered with users and different stakeholders along the whole continuation of the project. Iterative service design is a design methodology based on a cyclic process of prototyping, testing, analyzing, and refining. Based on the testing results of the most recent iteration of the design, changes and refinements are made.

The framework architecture presented in the CompLeap architeture bank and in this report has been built simultaneously to the work done on the user needs and user profiles. EDUFI has led the planning and definition process of the framework, as well as the interlinked prototypes. The planning and research phase has involved the mapping of relevant user profiles, the defining of user needs, and creating user scenarios and architecture and service framework mapping that serve as instructions for the use of service designers, UI and UX designers as well as ultimately the data scientists and full-stack developers.

End user testing is planned to be started with the Beta prototype in May 2019. Until then associate partners are involved to the co-creation process of designing CompLeap user scenarios as well as to the constant feedback loop to validate prototypes. Co-creative workshops are the key working method to co-develop user scenarios.
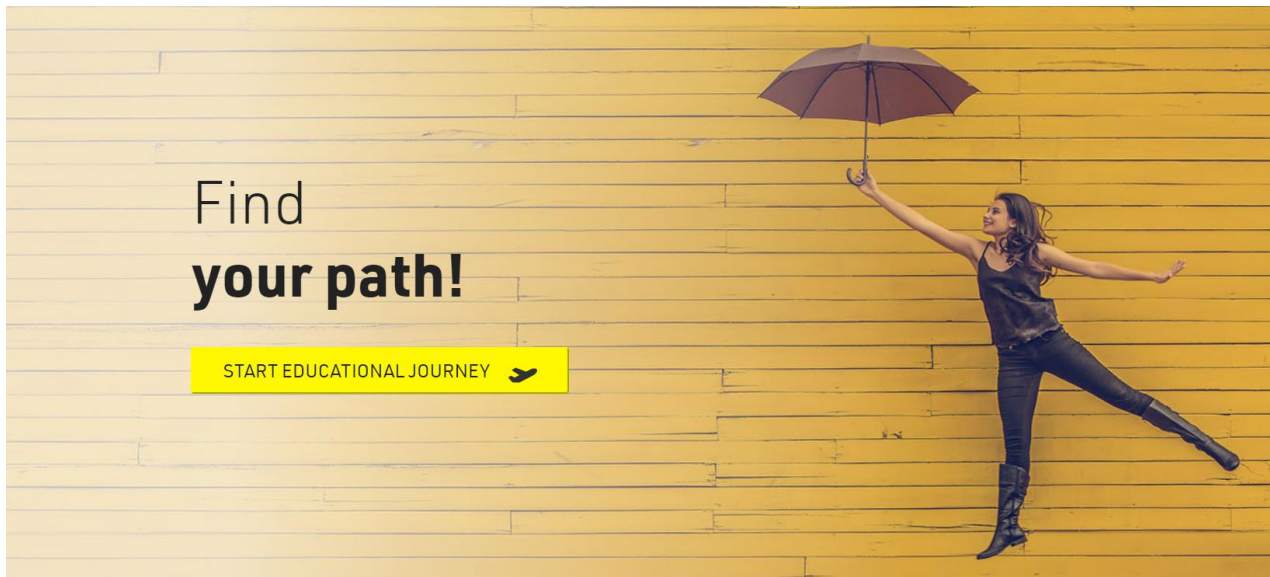
Picture 1: Landing page of the CompLeap architecture prototype (HTML)

2 Phases of Development

The prototype development is divided into four segments. User validation has been ongoing in all the phases of prototype development.

1. **Mapping architecture** – initial mapping of current service framework and creating of Architecture Bank:
   https://wiki.eduuni.fi/display/csccompleap/T1.1+Framework+architecture+design
2. **Mock up prototype** – visual screenshots of the modules for testing a concept
   https://projects.invisionapp.com/share/T5P4U1PHBDC#/screens
3. **HTML prototype** – more functionalities than a mock up proto, depicts full architecture framework https://compleap-proto.testiopintopolku.fi/
4. **Beta-pilot** – smaller sections that prove the concept in real life conditions:
   http://www.poc.compleap.testiopintopolku.fi

3 Mapping Current Architecture

In the initial phases of the project, the key needs for new services in the learner path were identified through mapping the service architecture. This was done on the basis of national related architectures such as the national reference architecture for education governance, the AMOS-(Ammatillinen Osaaminen = Vocational Competencies) reference architecture for secondary education, and on the EDUFI enterprise architecture. These are all interlinked. The CompLeap architecture work is as such based on the foundational full enterprise architecture on education governance ("Kansallinen opintohallinnon viitearkkitehtuuri KOHVI") by the Ministry of Education and culture from 2012.

Related Architectures, including the Ministry of Education National Enterprise Architecture for Education Governance:

3.1 Way of Working

The work on CompLeap framework architecture has been led by the Finnish national Agency for Education in strong cooperation with CSC, and with input from the full project team. The task force met weekly to develop and deepen the work from a learner centred perspective.

Starting off from the AMOS reference architecture and using Finnish government enterprise architecture method (JHS 179), which is mainly based on international de facto standard TOGAF, we first modelled a strategy map based directly on the project documents (Annex 1). After this, we began to sketch the main and sub business processes and services, i.e. the Learner Path.

This work was done utilising cross-sectoral expertise in the project team and at the National Agency for Education. The meetings were documented in eDuuni and resulted in an architecture bank with e.g. the below draft architecture images.

The CompLeap architecture image bank with specifications and interlinked user scenarios can be found here:
https://wiki.eduuni.fi/display/csccompleap/T1.1+Framework+architecture+design

The architecture images are updated continuously and will be evaluated and validated in the piloting phase.

3.2 The Learner Process

The Lerner Path defines the steps the learner takes to increment his/her competence. The architecture images detail three distinct levels.
1. The main learner process
2. The sub processes linked to the main process
3. The services linked to the main and sub processes

The depicting of the main process has guided the following deepening of the user scenarios and systems architecture needed to implement the main process.

The Main and Sub Processes and Services in the Learner Path
The below architecture model sums up the generic services that the Learner is using when developing compentecies in a lifelong perspective. The area circulated in green in the figure is the service area where research and stakeholder interaction showed most needs for new services. The below services circled in green are also the services which are most in need of developing digital

services for at the EU level. While the ways in which they are implemented in each EU-country naturally differ, synergies can be found at the architecture level.

Anticipation of needed skills	Competence development planning	Admissions	Acquiring competence	Using competences
	Identification of Personal Interests / Self evaluation of my competences / Automated Identification of prior learning / Education mapping	Application Procedure / Student selection	Recognition of prior learning / Showing non-verified competence and assesment / Personal Competence Development planning / Acquiring missing competences	
Guidance	Career and Study Guidance / Comparing opportunities / Competence mapping / Education offer	Application services / Student selection / Guidance	Recognition of prior learning / Career and Study Guidance in Education / Competence Development Service in Education / Personal assessment of learning / Student feedback / Digital learning resources / Graduated feedback / Versatile learning environments	Employment offer / Guidance

The value stream begins from the anticipation of needed skills where the learner recognizes the need for new skills or competences. The learner may use guidance at every stage of the leaner's pathway and the guidance could give impulses to the learner at every stage to guide the learner to right direction.

After the anticipation of needed skills the learner may do planning or do pre education personal competence development planning. The difference between the planning and pre education competence development planning is that the planning is not well structured process while the pre education personal competence development planning process is. Planning is more ad hoc and flexible and depends on the learner how planning is done or if it is done at all. The pre education personal competence development planning is defined by legal entity of the education and is formal way to do planning at that stage.

After planning the learner proceeds to education mapping and after finding proper education, the learner enters to admissions. After admissions the learner acquires competences and finally uses the competences. During acquiring the competences and using the competences the learner does personal competence development planning all the time. The personal competence development planning is also formal process defined by legal entity of the education which guides the learner to do planning all the time. While the learner may do other kind of planning also, the formal planning provides common tools and information to do planning in competence development scope.

4. First Iteration of User Scenarios

This first iteration of the user scenario was built for the full service ecosystem. It was created on the basis of current research on user needs as well as the needs for new services linking to finding a new direction in life and studies.

4.1 User Scenario for Leaner creating Competence profile

The Learner - generic user - starts to use CompLeap tools and creates My competence profile.
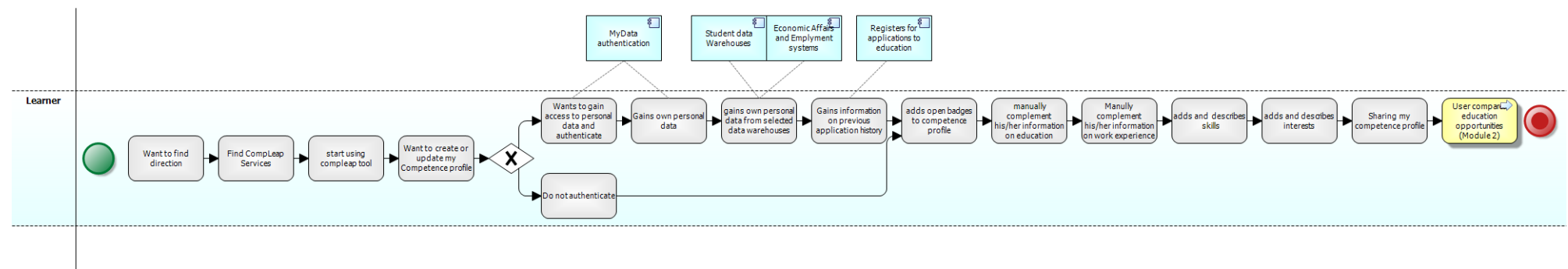
4.2 User Scenario for Learner Comparing Education Opportunities

The Learner – generic user – moves to comparing education opportunities from competence profile.
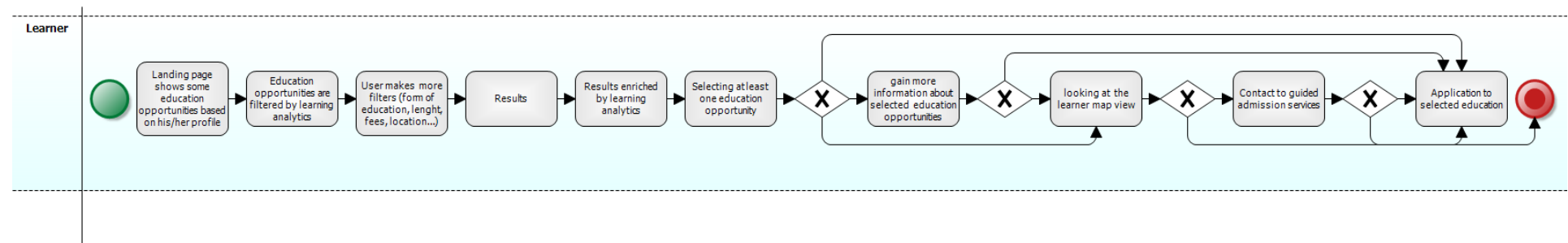
The learner may choose education from national core curriculum, also. The national core curriculum describes what education contains and competences can be learnt from the education. Before admission the learner has to map selected education to education offer to find education provider.

Learner can also identify single competences which she or he would like to learn and then find education providing those competences. This requires the competencies learner identifies are mapped to education. Learner can be interested in competencies not linked into education or not even provided by education, and in that case there should be a process to guide learner further.

4.3 User Scenario for Full Service Ecosystem

Learner can identify the goal, for example career, and if there is data available between the goal and competencies, then goal's competences can be compared to education and find the target education through this kind of mapping. This requires data about goals and link between goals and competences.
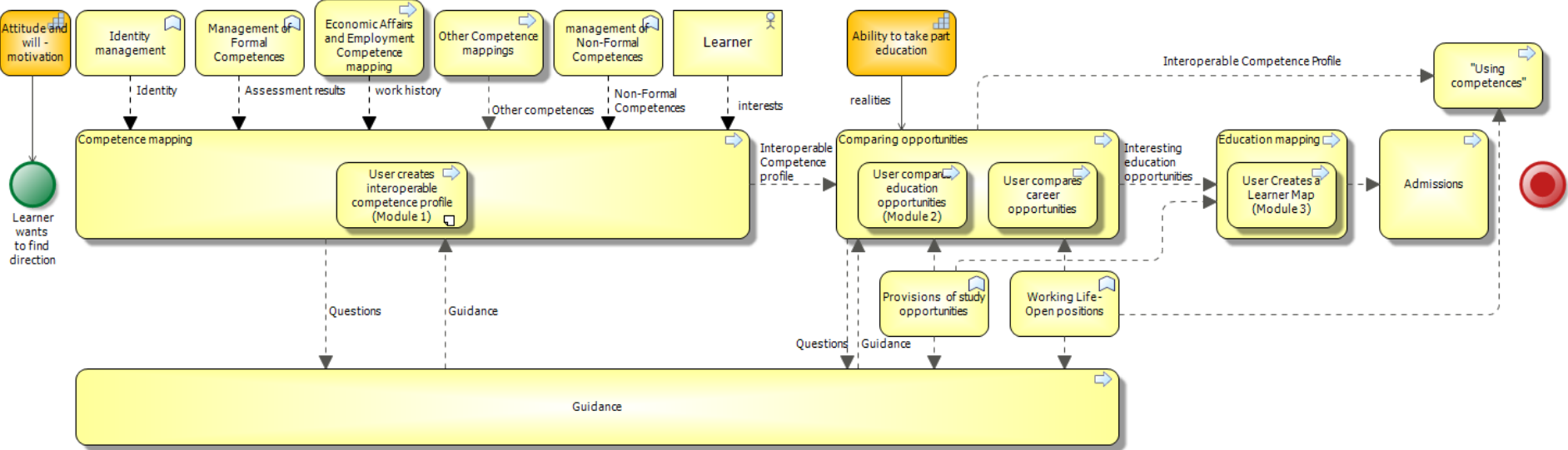
The above diagram shows how data concepts flow between the learner processes in the full service ecosystem. This flow is depicted in the html prototype. The beta version will implement key elements of this flow, including the creation of a (1) competence profile, (2) the comparing of opportunities, and (3) competence mapping.

Guidance can support planning at every stage. Before admissions the guidance providers can use their own tools to provide guidance services or they can help learner with Compleap tool. Either way the end result should be same from the learner's point of view, the learner gets enough guidance to admit to education according to hers or his interests and possibilities.

4.4 Information Systems Architecture (Application Architecture)

Layered Architecture views show processes, application services and information systems needed for providing CompLeap services. These are divided into pre-education planning and education planning. This means that plannin is done both on the direction one wishes to find and then once this is achieved, one moves towards more specific educational planning relating to the curriculum and the concrete educational offer.
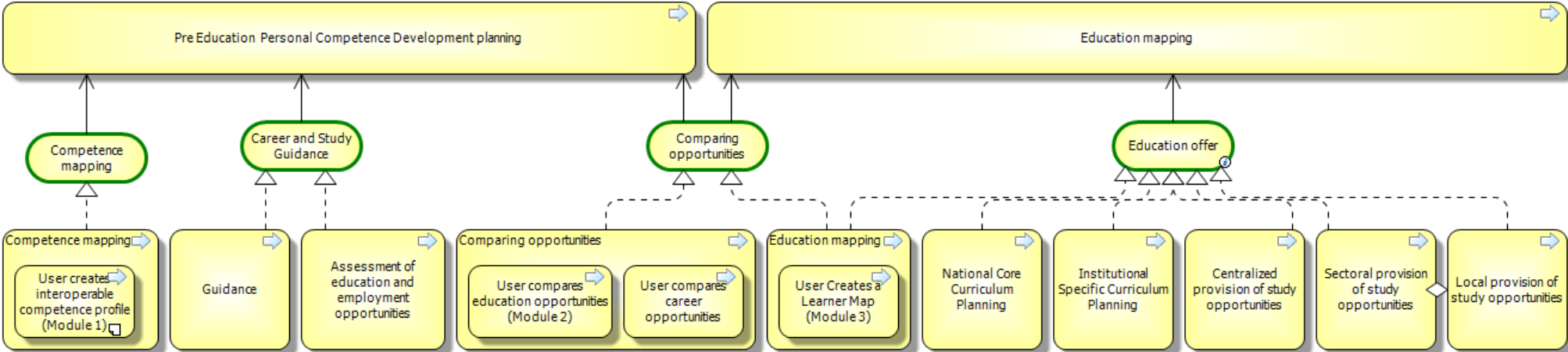
The below diagram then again describes how the competence mapping service is implemented, and when the learner uses the service the competence mapping process is executed. The learner gives information about her or himself and process outputs hers or his competences back to the learner.

Competence Mapping layered architecture view
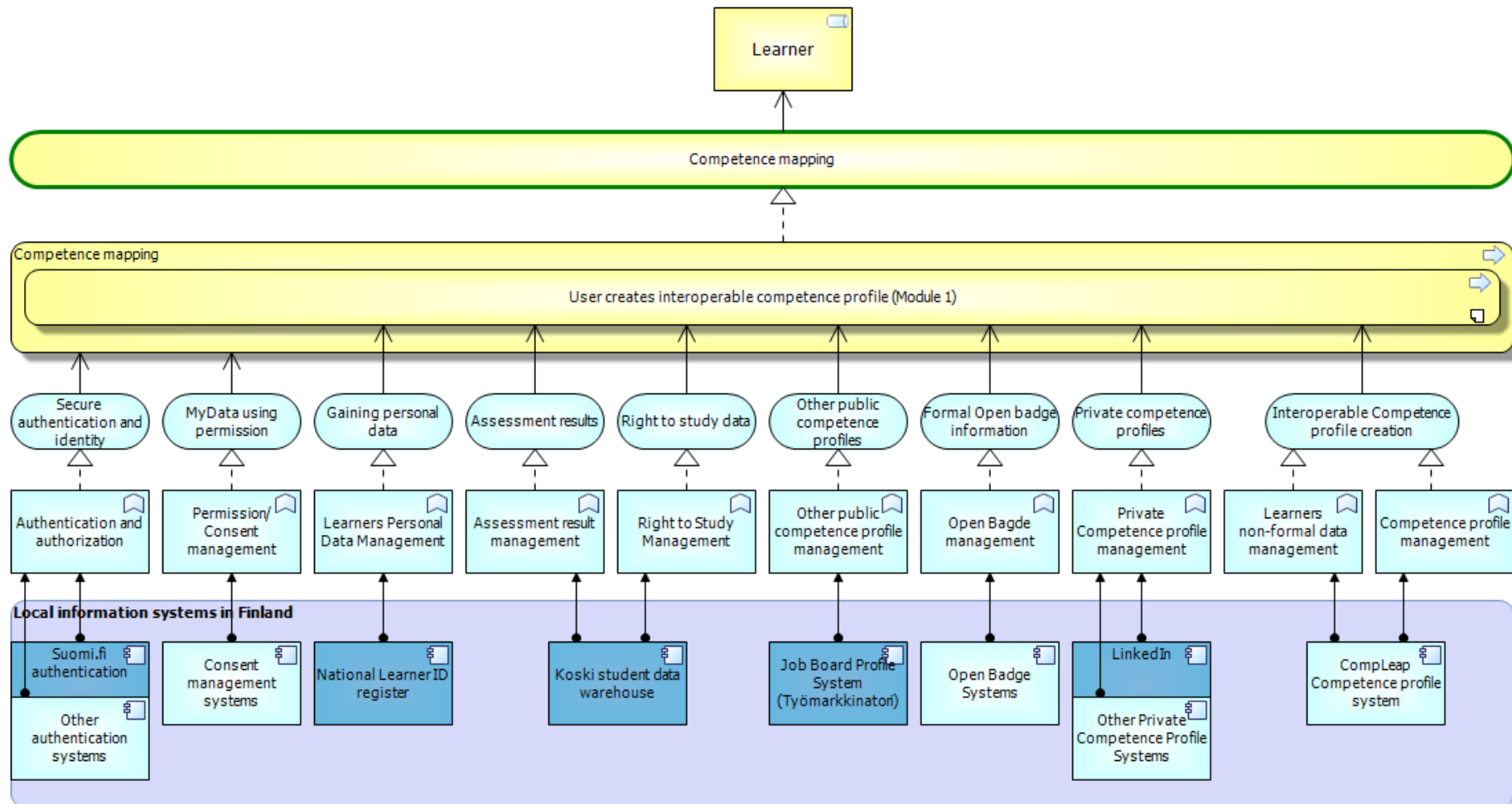
In the CompLeap context, the competence mapping process is digitalised, and the process of using the digitalized tool is put inside the competence mapping process. In this case, User creates interoperable competence profile process implements the whole competence mapping process but in other implementations there can be manual stages also.

The blue ovals describe the application services supporting the competence mapping process. The application functions are implementations of application services and there could be many application functions which are categorized as same application service. In the diagram only the relevant in the context of the framework are shown.

The lowest row of boxes are systems to which the application functions are assigned in Finland. Thus, the system row is implementation specific.

In this diagram the far right CompLeap Competence profile system is the service now being created which encompasses the three prototypes being delivered in WP3. The three prototypes planned embedded in the Learner Plan prototype and its three modules:

- Module 1: Local study record service integration (past)
- Module 2: Competence profile with current competencies (present)
- Modele 3: Suggestions for educational opportunities (future)

Also, a separate analytics prototype (Deliverable 28 Pilot deployment of analytics prototype) is developed and will be deployed in conjunction to the deployment of the prototypes above. With analytics the principal focus is on personalization and advising.

5. Guidance for Developers on User Requirements

This chapter details the user requirements detailed and discussed with the developers involved in the project in the first year of the project. In the following chapter the process on how these requirements were come up with will be detailed.

5.1 User Requirements for the First Mock-up Prototype

For the first Mock-up phase of prototype development, user needs for three identified service areas were compiled in the Stakeholder Seminar in Helsinki 9.4.2018. As a result of user and developer feedback three modules have been identified for further user testing:

1. Personal Competence Profile Module (independent module)
- User can use strong identification or none
  - Strong identification opens access to national databases and registers (if available) and their data
  - Compiling a profile using only user generated data is possible, especially for NEET and youth without registration methods
- Competence Mapping solutions for compiling information on ambitions, non-formal skills and interests
- Linkages to comparing educational opportunities and employment opportunities

2. Compare Module (independent module)
- offers personalised suggestions on educational opportunities based on the data from the personal competence profile – i.e. learns from user input.
- Can like or dismiss offered opportunities, whereby the system learns and suggests new intelligent options

3. Learner Map Module (dependent on 1 and 2)
- Personalised visualised map of future possibilities based on personal competence profile and compare module data
- Utilises data from Competence Profile and Compare Module

These modules were visualised in the Mock-up Invision Prototype:
https://invis.io/5KKEQGC2JN4

5.2 User Scenarios for Architecture prototype (HTML)

In the very early days of the project a preliminary user scenario was created to guide the mapping and definition process. This user scenario was then used to seek further input from both users and reference groups. later it was translated into concrete steps for the creation of an Invision Mock-up prototype.

User scenarios for the planned modules are constantly updated on the CompLeap Wiki -pages:
https://wiki.eduuni.fi/display/csccompleap/User+scenarios

The *service flow* begins with the learner's need to develop their competence or to access educational opportunities.

Inside the digital framework, the learner is guided to register themselves using strong identification. This is a prerequisite for accessing necessary data from national registries.

The next step is to map the learners' competencies. Data on prior education and training is collected from national registries and from the learner themselves. In addition, information on the learner's hopes and wishes on the acquisition of competencies is gathered from the learner themselves. The data is collected from a national registry on educational records (KOSKI). Base information on possible educational opportunities and their educational contents are found from a national registry of educational curricula (ePerusteet). Together these functionalities comprise the service of Competence Mapping.

The data the learner has inserted in the service of Competence Mapping is utilized to refine the educational opportunities offered to them. In this section/phase, the learner can insert additional search criteria, e.g. limit the search to a certain geographical area. If economic forecast data on the employment levels of certain educational fields is available, the learner could also possibly see these as a part of the attributes of the educational opportunity. Together these functionalities comprise the service of Comparing Educational Opportunities.

If the learner finds favourable and interesting opportunities, they can move on to inform the educational institute of their interest towards the educational opportunity. Once they apply, they transform from a learner into an applicant. The applicant can apply to multiple institutions and multiple study programmes.

The learner can also leave an open application, which is not targeted towards any specific institution, but is instead sent to every institution providing education in accordance to the learner's criteria. In this phase, additional and necessary information can be collected from the learner (via possible forms and questionnaires). The information of the applicant is saved and collected into a student admission register. If the applicant is accepted, information on the acceptance is also save into the student admission register. In addition, the educational institutes themselves can search for open applications. Together these functionalities comprise the service of Expression of Interest.

The following user scenarios were subsequently identified for the full architecture prototype. These were gathered and are constantly modified on the basis of user needs as well as available data sources and development and technological possibilities.

Creating a Competence Profile

1. User signs into service using secure electronic identification
2. user creates basic personal profile and opts to connect to national registers
3. the users verified competencies are collected from national registers

- the user opts which public services are included in the profile (e.g. Koski, Työmarkkinatori)

3. The prototype creates suggestions for competences
4. the user begins to compile competence profile through guided questions
   - information on employment
   - information on hobbbies

5. AI creates and visualises a preliminary personal competence profile for the user to see
6. the user can add the elements they wish to see in the personal competence profile and the AI learns and provides new competencies relating to previous selections

Sketching a Career and Dreams Profile

1. User completes personal motivation and competence tests
2. User gains visualised information on career goals and dreams
   - what kind of work you are looking for
   -what kind of setting you want to work in
   - what kind of subjects you are interested in
3. User adds relevant test results to personal profile

Seeing learning opportunities relating to your personal profile

1. User has created a useful competence profile
2. User sees possible education opportunities
3. User can select to see employment, training and apprenticeship opportunities
4. User gains access to filters and selects those relevant to him/her
   - geographical
   - length
   - language
   - degree / non-degree
   - level

Finding learningopportunities for missing competencies

1. User begins to use "KoulutusKipinä" (location based social education opportunity matching tool = LBSEOMP)
2. Based on algorythms user gets proposals for interesting opportunities (inlc. education, training, and employment)
3. User saves most inspiring opportunities into own Personal learner plan profile

Discussing opportunities in moderated environment

1. User can discuss with peers who have received similar opportunities
2. User can contact different kinds of (existing) career counselling services
   - clicking and calling e.g. Ohjaamo

Application to education/employment

1. User can move to application app
2. User can send application to selected recommendations

Inform of interest

1. User can inform of interest to inspiring education opportunities

2. User clicks"I'm interested" – box
3. data is collected on education needs, and email is sent to provider

5.3 Progression plan for the CompLeap Beta prototype in 2019

The CompLeap prototypes will be developed in two sessions. The primary phase being through February to May 2019. The aim is that everything produced in the CompLeap prototypes could be utilized in the further development of Opintopolku after the project ends. The first module utilized would be the provision of a competence profile into Opintopolku.

The three modules being developed are as follows:

- Module 1: Local study record service integration (past)
- Module 2: Competence profile with current competencies (present)
- Modele 3: Suggestions for educational opportunities (future)

5.3.1. Implemented by the 30th of May 2019

Competence Profile

- The learner's learning history is shown based on the local service integration to the KOSKI database and data from eCurriculum (Module 1)

- The learner can provide prior and future interests, which are shown as desired competencies (using ESCO classification)

- A first version of competences based on previous studies are linked to the ESCO classification, and are suggested for the user.

Recommended educational offer

- based on previous studies/competencies
- based on interests

Additionally, the prototype developed by the 30th of May has to be able to be partially deployed in the Netherlands. Deployment does not mean live use in Finland or the Netherlands.

5.3.2. Further development by 30th of August

The user piloting of the prototypes begins in May. Improvements to usability and tweaks based on feedback received in piloting are implemented by the 30th of August. Additionally, the possibility for the learner to include their Europass as well as Open Badges will be implemented in this stage.

6. Advice for Developers on Identified Users and Needs

The EDUFI and University of Oulu task force on developing the CompLeap Learner Path has identified key users and created profiles around them for user and stakeholder testing. The

CompLeap user profiles have been key information source in the development of the CompLeap architecture and prototypes.

Identification of the user groups was done to support identification of the user needs in different target groups. Similarly, important stakeholders such as student counsellors and study program coordinators were involved in the process of identifying user needs through stakeholder seminar workshops and discussions. After five user groups have been identified, user profiles were created representing each user group. Created user profiles or personas are characterized by features proposed by Baxter, Courage, Caine (2015, p. 39) including characteristics like demographics, occupation, education, specific experience, attitudes and values. There more specific user profiles were created to gain a better understanding of possible users, their needs and expectations for career and education guiding services. The following user profiles are used to guide testing sessions with guidance professionals.

Discussion with experienced career counsellor from Jyväskylä Educational Consortium Gradia was held about possible user groups. The discussion was focused to find out what groups of people usually approach guidance counsellors for career guidance advice and what are main characteristics of these groups. Career counsellor experience with people interested in career counselling services was integrated with literature research results from the field to identify possible user groups for vocational education and training recommendation system and other Compleap services. From the discussion, possible five user groups were identified as well as their special characteristics and challenges they may be facing. After that the need for support was assigned to each user group according to the experience and views expressed by guidance counsellors and literature. Identified user groups are: Immigrants, NEETs (not employed and not in education), basic education graduates (15-16 year old), unemployed and people in the midst of career shift. After the identification of user groups, user profiles or personas were created.

6.1 Research behind the User Profiles

The University of Oulu has conducted a desk and user needs research in the CompLeap project to gather, analyse and incorporate information about user perspectives, needs and challenges to the current development of CompLeap services (see also updated Deliverable 15).

This research entitled as "Services development process in the Competence Leap project 2017-2019 (University of Oulu 2018)" describes all the utilised research methods around the aim to achieve holistic understanding about user needs in the development of CompLeap prototypes. The research also includes detailed descriptions about the Stakeholder seminars and workshops during the year 2018 in which the development of user scenarios also builds upon.

The user scenarios comprise of firstly elaborated key user groups and secondly user personas based on the selected key user groups. The HTML-prototype exemplifies the user flow by selected user personas. The prototype was finalized by the end of January 2019. The following CompLeap user personas was selected for depicting the architecture (HTML prototype).

- LISA
- ELEONORA
- MUHAMMED JAMALA (immigrant) – Included Spring 2019

User groups as well as user personas were designed alongside with the launch of the project in Spring 2018, but the fine-tuning work around the user personas has continued until Spring 2019. Associated partners represent the key task force to develop, complete and validate the user groups and user personas with the facilitation of EDUFI.

Associate partners comprise of rich group of experienced student counsellors and study program coordinators and IT-specialists from the Finnish vocational education institutions. In the prototype development before the deployment of Beta prototype, associate partners' expertise represents the important interface of the end user needs. As planned in the project, students from the associate partners will start the testing of the Beta prototype in May 2019.

Associated partners from the Finnish VET sector listed below:
- Jyväskylä Educational Consortium Gradia – Leader of the workpackage "Deployment and evaluation"
- The Oulu Region Joint Authority for Education OSAO
- Rovaniemi Municipal federation of Education REDU

Contact details about the group of professionals included in the Associate partners can be found here: https://wiki.eduuni.fi/display/csccompleap/a.+WP4+Crew

6.2 Co-creative workshops with the associate partners

1. **Associated Partner Kick-off Workshop 18th of September 2018 at Gradia, Jyväskylä Finland**
2. **Reference Group Workshop 10th of October 2018 at EDUFI, Helsinki Finland**
3. **Associated Partner Workshop 31st October 2018 at OSAO, Oulu Finland**
4. **Associated Partner Workshop 17th January 2019 at TREDU, Tampere Finland**
5. **Associated Partner Workshop 14th of February 2019 at EDUFI, Helsinki Finland**

Detailed description of the Associated Parner workshops:
https://wiki.eduuni.fi/display/csccompleap/c.+WP4+Workshops+for+the+Associated+partners

Associated Partner Kick-off Workshop 18th of September 2018 at Gradia, Jyväskylä Finland

AIM: Workshop was aimed at gaining information what user requirements seem the most important to associated partners how are they prioritized.
https://wiki.eduuni.fi/display/csccompleap/a.+GRADIA-workshop+18.9.2018

RESULT: The results of this associated partners workshop was modification of personas so that they represent the actual potential user groups as much as possible and prioritizing the requirements for Compleap service functionalities.

The most prioritized user requirements were:

1. User sees current competences in user profile
2. The user can map out what kind of work he wants to do in connection to their values

3. User can use strong and light identification (consideration for security and privacy)
4. The user can create his own skill profile that can be shared in order to market his expertise
5. The user will receive suggestions for training appropriate to him / her / and opportunities for accumulating skills

Reference Group Workshop 10th of October 2018 at EDUFI, Helsinki Finland

AIM:
Goals of this workshop were to get feedback from the associated partners about the current prototype, identify the place for Compleap in the network of digital services and clarify what enables the identified target

https://tt.eduuni.fi/sites/csc-compleap/_layouts/15/start.aspx#/SitePages/Home.aspx?RootFolder=%2Fsites%2Fcsc-compleap%2FShared%20Documents%2FWP2%20Requirements%20and%20architecture%20design%2FReference%20Group%20Seminar%20Oct%2010&FolderCTID=0x012000017D22A9EF309049A26A5530FE5F9D75&View=%7B0358A196-EBBF-46AB-847F-0933E3B2C382%7D

RESULT: Comments and feedback about the developed prototype was gathered from all groups and summarized crystalizing main points:

- Not clear for the potential users, how and why to start using the guiding services(Compleap)? There is a need to motivating the user to use the services, emphasizing personal gains.
- Idea: Common data model with Työmarkkinatori and ESCO could be used, providing and exchanging information
- The data could be following the user, even if he relocates in EU countries, taking up different education and gaining competences. This data should be used for guidance.
- Filtering of the possibilities (duration of education, location, costs), e.g. location is important for adult learners
- How the soft data – dreams, goals etc. are reflected in Compleap? Could this information also be visualized, reflected in the services?
- Is the target knowledge-based or degree-oriented?
- Information about the funding of the studies is needed

Associated Partner Workshop 31st October 2018 at OSAO, Oulu Finland

AIM: Workshop was aimed at gaining associated partners perspective and input analytics functionalities in Compleap project, specifically on competence visualisations. Participants were engaged in group work, brainstorming visualisation ideas and discussing them in the groups. Later all ideas were gathered, presented and requirements for competence visualisations were summarized. https://wiki.eduuni.fi/display/csccompleap/b.+OSAO-workshop+31.10.2018

RESULT: seven different ideas were presented by the associated partners for competence visualisations. Key points of the visualization element were:

- The image interpretation must be very clear – an everyday life figure or illustration
- Visualization is a living and alterable element – user can add and remove input values
- Interactive functionalities raises user's interest in the user experience
- There is need for a formal list of skills/strengths in addition to the picture visualisation
- Visualization helps user see the gap between the goal and current skills

Associated Partner Workshop 17th January 2019 at TREDU, Tampere Finland

AIM: Workshop was aimed to build visual user journeys to have holistic understanding on the service flows from the end user perspective but also have a reality check on user personas as potential CompLeap users.

- https://wiki.eduuni.fi/display/csccompleap/c.+TREDU-workshop+17.1.2019

RESULT: User journeys were built around three CompLeap user personas Lisa, Eleonora, Stanis, Maryam. After the workshop EDUFI selected Eleonora, Muhammed Jamal and Lisa to the prototype personas.

6.3 Identified User Groups

Group	Registration	Prior data about the person	Challenges	User profile – specific needs	Need of guidance?	Who is impacting the decision making?
Immigrant	No possibility of strong registration	No prior data in registries or documentation	Lacking language competence, issues with understanding educational, social and societal concepts, possible lack of motivation, skills mismatch	Clarity, simple language, multilingualism, visualisations, multi-channel, support should be easily accessed	Strong	Family, parents, guidance actors (councellors etc)
NEET	Possibility of strong registration	Transcripts of study records, employment application data, educational application data	No motivation, learning difficulties, former bad experiences with education	Ease-of-use, compelling interface/use, gamification, ease of access to information, clarity and simple language	Strong	Coaching, workshops, youth work centres
In the midst of a	Possibility of strong registration	Prior data	Motivation external, circumstantial changes,	Relevance and validity of the data	Medium	Employability, employment situation (local,

career shift			looking for a new direction			national, field-specific), coaching
Currently employed (~30-50yo)	Possibility of strong registration	No prior data in registries, some documentation formal competence	Circumstantial change, updating vocational competence	Relevance and validity of the data	Minimal	Employer, career development
Basic education graduate	No possibility of strong registration	Transcripts of records	Unclear of their educational/ vocational direction	Visuality and ease-of-use	Medium	Family, parents, guidance actors (councellors etc), friends

Table 3. User groups and their more detailed user stories/personas

7 User personas by user groups

Immigrants	**Maryam (23)** escaped the civil unrests and wars in Middle East when she was 18 years old. After making it to Europe her family split and she made it out to Germany and started to daunting task of finding a better fortune then what she left behind. After spending few years in Germany she got acquainted with Matias, a Finnish fellow to whom she eventually got married and moved to Finland. Maryam believes that cracking any culture requires the knowledge of the language, so she enrolled to a Finnish course immediately. After learning the language she would love to get a part-time job and then further her studies in the field of IT and/or healthcare. Maryam has tried to find some information about educational offer from opintopolku.fi, but she is not sure, which education would be the best for her compared to her experience, competencies and previous education.	**Goals:** Settle in Finland, Learn Finnish language, Find a stable workplace **Concerns:** People in Finland seem distant, Can't get any interviews for part time jobs, It is hard to find friends Interests:Information Technology, Health care,Music "Finally a moment of peace" Work: Unemployed Education: Upper secondary school, general ed. Family: Married Location: Tampere, Finland
NEETs	**Liisa (16)** will soon finish her 10th grade studies. During the upper-elementary school, she did not show so much interest towards school and therefore her grades were not sufficient for any secondary studies in the end of 9th grade. During the summer, she decided with her family, that she will start 10th grade and work-hard the whole year to raise her	"Vocational training, general education in high school, how should i know what to choose?" Work: no experience Education: Basic education

	grades at least in Finnish, English, mathematics and biology. During that year, she got really interested about chemistry, but because her lower success in previous years, she couldn't progress in it as much as she would have wanted. Now she has raised the grades, but is still frustrated of what to choose. Would high school be too difficult? What to study in vocational education then? Liisa enters to mesaatio.fi and starts to investigate the data about different fields.	Family: Mother, father Location: Kotka, Finland **Goals:** To decide what study next **Concerns:**Not enough knowledge to make a right choice,uncertain about her skills as a learner **Interests:** Chemistry, travelling
Basic education graduates	**Kaisa (17)** is a skilled artist. From her first steps she has always been into drawing and following her surroundings carefully and recording them on paper. If she were to be asked, she would want to just create beautiful things around her and that no one would interrupt her. She completed an art school in her hometown after she completed her elementary school. Art-school studies were challenging but she felt at home with other like-minded, artistically gifted people. Now after graduation Kaisa feels overwhelmed with what to do and how to make ends meet. Kaisas' mum has explored different options with her daughter for career, work and study opportunities through the website kunkoululoppuu.fi. They have found some interesting ideas to connect her drawing skills with coding or marketing, but she does not know where she could study that kind of things. Besides that, she doesn't know any other girls that would code and is afraid to ask any help for that. She is also scared to move away from home.	**Goals:**to find an inspiring job,Be remembered by her skills, Be a source of inspiration for others **Concerns** People and social situations are difficult, Almost always gets fired from jobs, Does not know how to use her skills and education to get employed **Interests:** Drawing, Design "I like pretty things" Family: Her parents and a brother Work: Unemployed Education: Vocat., Arts Location: Liminka, Finland
Unemployed	**Raimo (55)** has been unemployed more or less constantly since the mid 1990s economic collapse. Raimo used to work in project management after graduation. He has had short-term and fixed-term positions, but no permanent contracts have been awarded. Considers himself to be a hard-working and honest. Has kept himself occupied with his children's needs. Volunteers in his children's school as a general housekeeper and guard at recess breaks. Participates in a lot of job coaching activities especially when his ex-partner has the kids. Feels frustrated at the	**Goals:**Help kids get through school, Find meaningful pursuits in life, Bring up his kids well **Concerns:** Been unemployed for long, Doubts whether will ever find employment, Retirement age is approaching, feels unaware about the modern working culture **Interests:**MOOCS,volunteer jobs at school,Old cars

	system and doesn't feel it is helping him and also a bit hopeless that he will ever find permanent employment. Similarly, Raimo is a bit afraid of getting some work. He is not sure if his competencies match for any jobs available in 2018. He has tried to find out through osaan.fi, what kind of competencies he has and kept his technological skills updated through short-term website courses. He is not really motivated to apply any jobs anymore, but recently he heard about the twelve-weeks programming courses in Helsinki and got interested about that.	"I want to help people to grow to their full potential" Work: Unemployed Education: Engineer Family: Divorced with 2 kids Location: Helsinki, Finland
Shifting career	**Jouko (21)** has completed his secondary education as vocational training and has earned an electrician's degree. After completing his education he has worked in short-term part-time jobs not directly in the field of his acquired competences. Currently he has not found any work and is unemployed. He has started to think that he might need to acquire new skills and competences because there are no jobs matching his interests or skills he has learnt. He also has no interest in leaving his current surroundings. Jouko has used osaan.fi – website for trying to recognize, what kind of formal competencies he already has, but it made him confused. Besides that has has made several different tests to find out, what kind of fields would be good for him. He has also collected a lot of different kind of working experience from a variety of different short-term jobs he has had after his graduation, but he doesn't know how to describe all that in work applications properly.	**Goals:** Finding employment, Possibly getting new skills and competences, Find out his place in the world **Concerns:** Wouldn't like to leave his hometown No educational or learning options available nearby.Not available jobs for electrician nearby his hometown. Would like to get permanent job **Interests:** Water system installations, mathematics, programming "I don't know what to do in my situation"Work: Unemployed Education: VET., Electrician Family: Dog Location: Ilomantsi, Finland

Table 4: User groups and their more detailed user stories/personas (University of Oulu 2018)

JOUKO

- Age: 21
- Work: Unemployed
- Education: Vocational, Electrician
- Family: Dog
- Location: Ilomantsi, Finland

Picture does not fit to the discription of the persona!

BIO
- Jouko has completed his upper secondary vocational education and has earned an electrician's degree. He has worked in short-term part-time jobs not directly in the field of his acquired competences. Currently he is unemployed. He has started to think that he might need to acquire new skills and competences because there are no jobs matching his interests or skills. He also has no interest in leaving his current surroundings. Jouko has used osaan.fi –website for trying to recognize, what kind of formal competencies he already has, but it left him confused. He has also a lot of different kinds of work experience from a variety of short-term jobs he has had after his graduation, but he doesn't know how to describe his experience properly in work applications.

GOALS
- Finding work near his home
- Would like to get a full-time, permanent job
- Possibly getting new skills and competences
- Finding out his place in world

CONCERNS
- Wouldn't like to leave his hometown
- No new educational or learning options available nearby
- current education not enough to gain employment
- Not interested in short term jobs

INTERESTS
- Plumbing
- Mathematics
- Programming
- Technology and gadgets

Factors that motivate Johan to finding new direction for life:
- Economic situation
- Gaining more independence
- Post-graduate studies
- Girl fried/friend (relationship)

Key findings on Johan's needs and behaviour:
- Need to extend the breadth and depth of skills
- To visualise competences
- Generally, very difficult to describe acquired competences – CompLeap could help users!
- By visual geographical map, service could inform about regional educations and jobs also beyond municipal borders
- How user can enrich profile by non/in-formal and soft competences and skills?
- What are soft competences in relation to electrician as an occupation?

General discussion on professional ethics on guidance counselling?
- Guidance counsellor depict the future learner path with the end user
- To facilitate the user for making their own decisions

Johan was not one of the selected personas in user journey exercise on 17th of January 2019. EDUFI experts made this choice to select CompLeap personas with most the different user pathways.

KAISA / ELEONORA

- Age: 21
- Work: **supermarket cashier**
- Education: Vocat., Arts
- Family: **Mother of one child**, mother and a brother
- Location: Liminka, Finland

BIO

- Kaisa has always been into drawing. She has completed an art school in her home town after she completed her basic (primary + lower secondary) school. Art-school studies were challenging but she felt at home with other like-minded, artistically gifted people. Now after graduation Kaisa feels overwhelmed with what to do and how to make ends meet. Kaisas has explored different options with her friend for career, work and study opportunities through the website kunkoululoppuu.fi. They have found some interesting ideas to connect her drawing skills with coding or marketing, but she does not know where she could study that kind of things.

GOALS

- To find an inspiring job
- Be remembered by her skills
- Be a source of inspiration for others

CONCERNS

- People and social situations are difficult
- Almost always gets fired from jobs
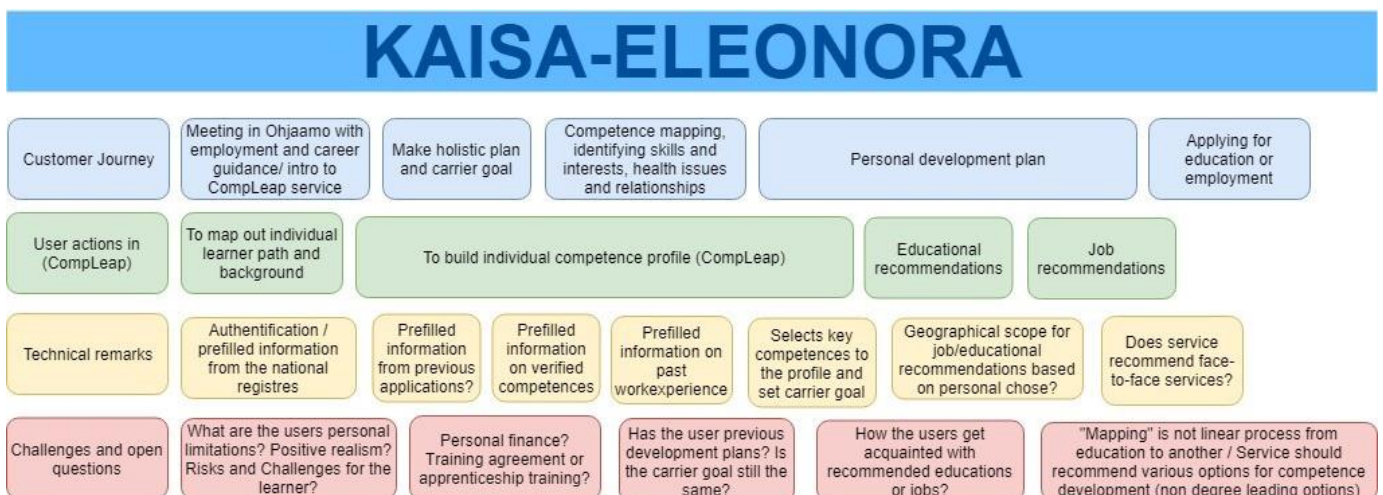- Does not know how to use her skills and education to get employed

INTERESTS

- Drawing
- Design
- Tinkering and similar hobby crafts

Eleonora was not selected to the workshop 18th September 2018. The user bio was updated after the workshop by EDUFI experts and reference group feedback. Work background was changes to "supermarket cashier" and family background to a "mother of one child". These changes were made because 4/5 (Eleonora; Johan; Maryam; Stanis) of CompLeap user personas were found with the status "unemployed".

To better support the idea of life-long learning and the need to acquire new skills in various life situations, Eleonora's work background was updated. For the same reason Eleonora was selected to the realisation of the HTML-prototype.

Eleonora's user journey

KAISA-ELEONORA

Customer Journey	Meeting in Ohjaamo with employment and career guidance/ intro to CompLeap service	Make holistic plan and carrier goal	Competence mapping, identifying skills and interests, health issues and relationships	Personal development plan	Applying for education or employment
User actions in (CompLeap)	To map out individual learner path and background	To build individual competence profile (CompLeap)		Educational recommendations	Job recommendations
Technical remarks	Authentification / prefilled information from the national registres	Prefilled information from previous applications?	Prefilled information on verified competences	Prefilled information on past workexperience	Selects key competences to the profile and set carrier goal	Geographical scope for job/educational recommendations based on personal chose?	Does service recommend face-to-face services?
Challenges and open questions	What are the users personal limitations? Positive realism? Risks and Challenges for the learner?	Personal finance? Training agreement or apprenticeship training?	Has the user previous development plans? Is the carrier goal still the same?	How the users get acquainted with recommended educations or jobs?	"Mapping" is not linear process from education to another / Service should recommend various options for competence development (non degree leading options)

Challenges and possible improvements

Based on the user journey exercise a few most important limitations or open questions are listed here in relation to this Eleonora's user persona.

Does Eleonora already have personal development plan (*HOKS in Finnish*)?
-   Could user utilise information on previous plans in CompLeap?

Education pathways are rarely in reality linear processes from education to another
-   How service support more complex personal pathways?

Could CompLeap also direct to guidance/career services?
-   Not only vice versa: from career services to CompLeap?

Elonora's user profile in the HTML prototype

Eleonora represents a persona with a "shifting career" background in relation to our five categories of user groups (immigrant, NEET, basic education graduates, unemployed, shifting career). She was selected to showcase the user flow in the HTML-prototype.

Eleonora's profile in the prototype: https://compleap-proto.testiopintopolku.fi/welcome/1002

7.3 UPDATED MARYAM

- Age: 23
- Work: Unemployed
- Education: Upper secondary school
- Critical info / where has been submitted secondary education? Could it be recognized?
- Language skills: German language course
- Family: Married
- Location: Tampere, Finland

BIO

- Maryam escaped the civil unrests and wars in her own country when she was 18 years old. After spending few years in Germany she got acquainted with Matias, a Finnish fellow to whom she eventually got married and moved to Finland. Maryam believes that cracking any culture requires the knowledge of the language, so she enrolled to a Finnish course immediately. She would love to get a part-time job and then continue studies in the field of IT and/or healthcare. Maryam has tried to find some information about education from opintopolku.fi, but she is not sure, which education would be the best for her compared to her experiences and previous education.
- Where Mariam is from? What is her proficiency in Finnish language?

MARYAM

GOALS

- Settle in Finland
- Learn Finnish language
- Find a stable work place

CONCERNS

- People in Finland seem distant
- Can't get any interviews for part-time jobs
- It is hard to find friends independently / described already in the first bullet

INTERESTS

- Information Technology
- Health care
- Music

Motivation factors?

Factors that motivate Maryam to finding new direction for life:
- Family/relationship – safe life conditions
- Language skills – get along with the new home country
- Integration to the society – friends
- Social capital – friends
- To cover living costs
- Feeling of safety

Key findings on Maryam's needs and behaviour:
- Submitted secondary education – but in which country, profile must be updated
- What is user's language skill in Finnish language? How accessible CompLeap service is to Maryam?
- Would need more information on Finnish education system
- User might have unrealistic ideas about Finnish educational system?
- How Maryam could recognise her secondary education's degree? Could EDUFI's service's on the recognition and international comparability of qualifications be brought on CompLeap?
- NB! User cannot bring verified/prefilled information on CompLeap service?
- Service could help the immigrant to get acquainted with Finnish working standards and requirements.

Maryam's user journey
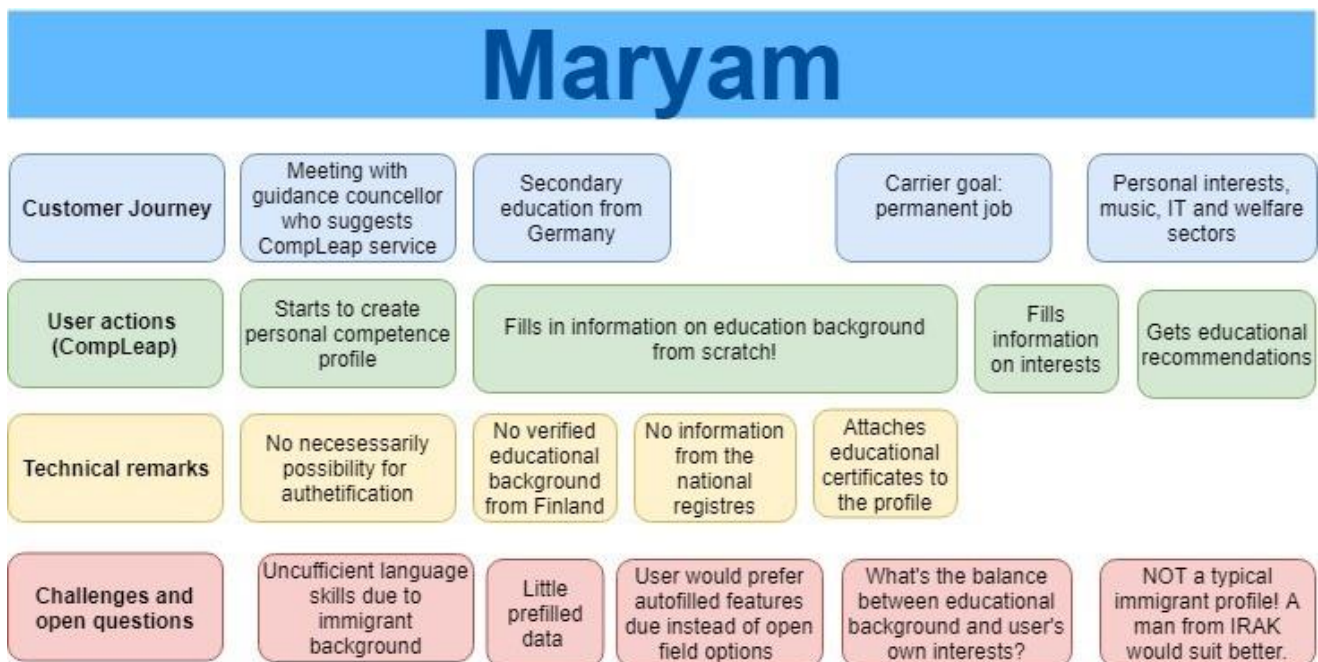
After the exercise on Maryam's user journey and gathered feedback from associate partners.
It was clearly stated that Maryam's bio does not illustrate well the selected user group such as
"immigrant". For this reason, EDUFI decided to introduce a new better suiting persona to the
immigrant profile. Therefore "Muhammed Jamal" was introduced and Maryam was replaced by
Muhammed Jamal in the HTML prototype.

Challenges and possible improvements

Based on the user journey exercise a few most important limitations or open questions are listed
here in relation to the Maryams's user persona.

Maryam is not typical immigrant with reference to her bio!
- Young man from Irak would be more representative in Finnish context.

Not much open text boxes for persons of immigrant background.
- Might have difficulties to produce long texts in foreign language.

Does educational offer include all sorts of preparatory courses?
- Current educational offer in studyinfo.fi service does not allow to publish non-degree
  oriented short-term preparatory courses.

LIISA/LISA

- Age: 16
- Work: -
- Education: Basic grades 1-10
- Family: Mother, father — multicultural family
- Location: Kotka, Finland

BIO

- Liisa will soon finish her 10th grade studies. During school, she did not show so much interest towards school and therefore her grades were not sufficient for any upper secondary level studies last year. During the summer, she decided to start 10th grade and work-hard the whole year to raise her grades. During that year, she got really interested about chemistry, but because her lower success in previous years, she couldn't progress in it as much as she would have wanted. Now she is frustrated of what to choose. Would general upper secondary education be too difficult? What to study in vocational education then? Liisa has tried mesaatio.fi to investigate data about different educational fields.

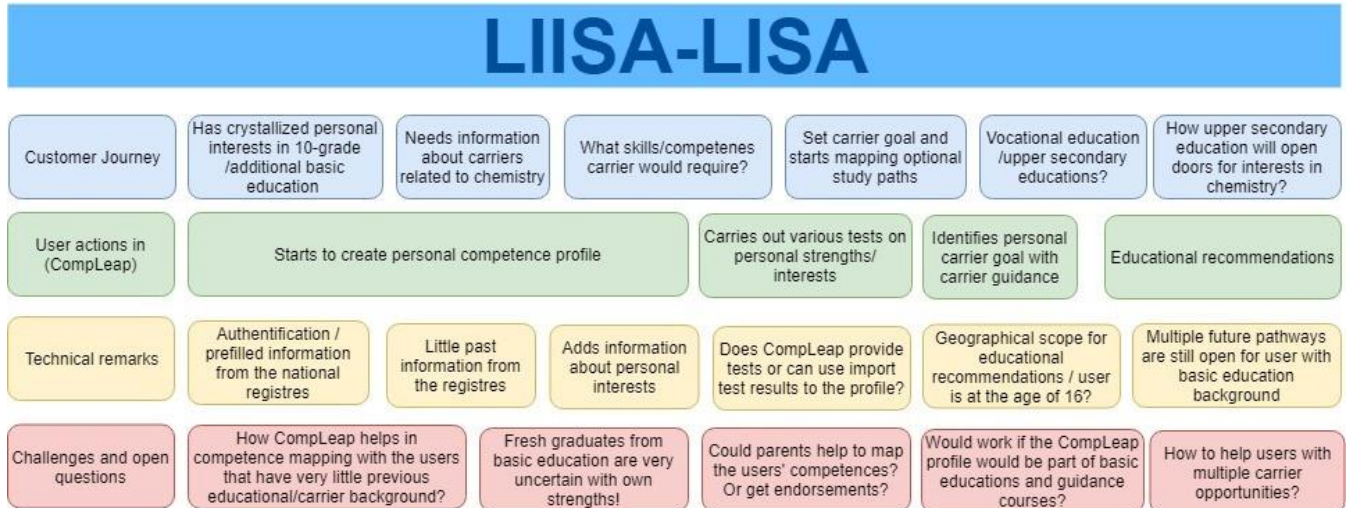## GOALS

- Decide what to study next

CONCERNS

- Not enough knowledge to make a right choice
- Uncertain about her skills as a learner
- Funding for secondary education, because parents are poor

INTERESTS

- Chemistry
- Travelling in her mother's home country

Motivation factors?
- Skills in chemistry, positive experiences
- Pressures on post-secondary studies
- Positive feedback, choice on future occupation is very important decision on young's life
- Internal motivation: self-motivation and consciousness
- External motivation: pressure to find meaning and direction for life

Key findings on Maryam's needs and behaviour:
- Whole world of opportunities is open to Lisa
- Direction must be found based on own interest and opportunities
- Recent graduate wants to first expand the range of opportunities, expand the scope of experiences on different fields and educations
- Needs the support from guidance counsellors and parents
- Could benefit from online mentoring in CompLeap?
- Wants to depict future vision in CompLeap service

Lisa's user journey

Challenges and possible improvements

Based on the user journey exercise a few most important limitations or open questions are listed here in relation to the Lisa's user persona.

Very difficult to recognize own strengths and competences at this early phase of life?
- Could parents help in finding future interests and own strengths?

In which kind of situation, the profile would be created?
- It could be compulsory part of the councelling courses before applying to the secondary education

Lisa's user profile in the HTML prototype

Lisa represents a "NEET young" as well as a "basic education graduate" in relation to our five categories of user groups (immigrant, NEET, basic education graduates, unemployed, unemployed, shifting career). Her profile was selected to showcase user flow in the HTML-prototype.

Lisa's profile in the prototype: https://compleap-proto.testiopintopolku.fi/welcome/1001

RAIMO

- Age: 55
- Work: Unemployed
- Education: Engineer, are the competences already outdated?
- Family: Divorced with 2 kids
- Location: Helsinki, Finland

BIO

- Raimo has been unemployed since the mid 1990s.. He has had short-term and fixed-term positions, but no permanent contracts have been awarded. Has kept himself occupied by volunteering in his children's school as a general house keeper and guard at recess breaks. Participates in a lot of job coaching activities. Feels frustrated at the system and doesn't feel it is helping him. Similarly is not sure if his competencies match for any jobs available in 2018. He has tried to find out through osaan.fi, what kind of competencies he has and kept his technological skills updated through short-term website courses.

GOALS
- Help kids get through school
- Find meaningful pursuits in life
- Bring up his kids well
- Have a permanent job

CONCERNS
- Been unemployed for long
- Doubts whether will ever find employment
- Retirement age is approaching
- Feels that modern working culture is distant for him

INTERESTS
- MOOCs
- Volunteer jobs at school
- Old cars
- What about his values?

Motivation factors?
- By mapping the interests Stanis can find new career opportunities
- Important provide secure income
- External motivation: to safeguard children's future prospects
- Internal motivation: to find new meaningful directions and civic participation for life and civil society

Key findings on Stanis's needs and behaviour:
- Outdated qualifications? Competences outdated?
- Frustration towards public services?
- Stanis creates his competence profile and shares the profile
- Service would visualise existing competences
- Service would visualise existing non/in-formal competences
- Stanis could import-export CV-data on machine readable format
- Competence profile a portfolio to gather life-long learning knowledge
- Stanis would have personalized forecasts on labour and employment needs
- Stanis could market his competence profile
- Stanis could have matches linked to the regional job offer / Työmarkkinatori
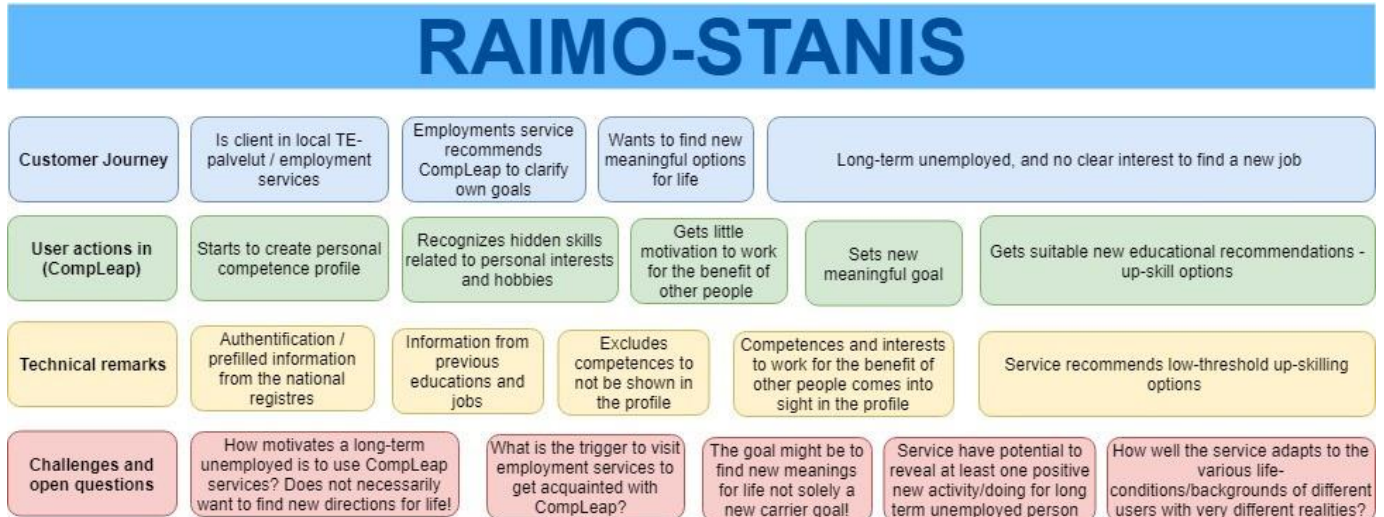
Stanis's user journey

Challenges and possible improvements

Based on the user journey exercise a few most important limitations or open questions are listed here in relation to the Stanis's user persona.

Stanis does not necessarily have motivation to use CompLeap

- Is Stanis on the CompLeap target group?
- Stanis does does not necessarily have any motivation to find new job?

Most likely Stanis will utilise CompLeap only if employment office will suggest this.

7.6 NEW: MOHAMMED JAMAL

In the workshop with the associated partners (January 17th, 2019 in Tampere, Finland) it was realized how the Maryam's user profile does not represent a typical immigrant background of person in for the Finnish associated partners from the VET sector.

Maryam was replaced by Mohammed Jamal, a young man from Irak without previous connections to Finland. Maryam's gender and a path from Germany to Finland with a Finnish boyfriend did not illustrate a typical story to end up in Finland. Subsequent of the workshop in January experts in EDUFI enriched the Muhammed Jamal's with the needed details in comparison of the Maryam's background.

Mohammed was selected to showcase the user flow in the HTML-prototype.
Eleonora's profile in the prototype: https://compleap-proto.testiopintopolku.fi/welcome/1003

Mohammed **Jamal's** bio was **elaborated** as such:
Age: 20
Work: part-time warehouse worker
Education: Upper secondary education in Irak – not verified
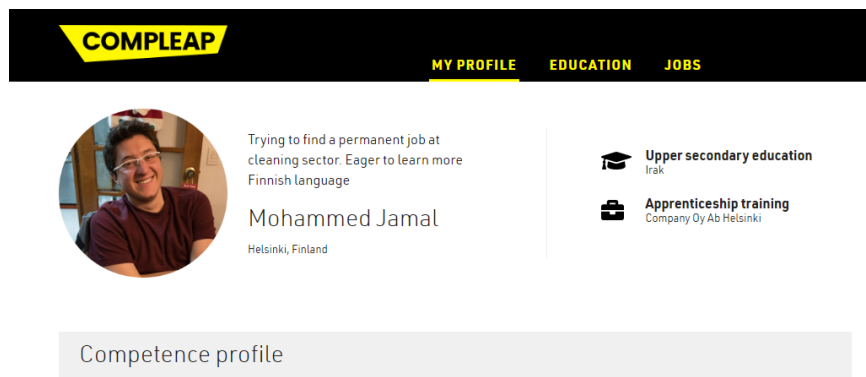Location: Helsinki

GOAL:
Permanent job at cleaning sector
Eager to learn more Finnish language

INTERESTS:

Having fun with friends

Social media – youtube channel / football postcasts

Football

KEY COMPETENCES:

customer-orientation

maintenance cleaning services

experience in various customer sites and customer service situations

English language

Picture: Mohammed Jamal's user persona added to the HTML-prototype.

8 Continuous Feedback from Stakeholders on Requirements and User Needs

With continuous testing and validation, we are acquiring a deeper understanding of users, their current needs and avoiding mismatch in service design. Alongside with this, more thematic webinars are held on monthly basis to the open group of various stakeholders. Stakeholders compose a reference group for the CompLeap project that are actively invited to the different project events.

The below webinars have discussed more thematic issues around the creation of Learner-centered digital ecosystem of competence development. But also interlinking these thematic issues tightly to the prototype development process. EDUFI chooses the relevant themes and invites the suitable external speakers to the webinars.

8.1 Thematic Reference Group Webinars:
https://wiki.eduuni.fi/display/csccompleap/CompLeap+Events

The reference Group webinars have been the key way of stakeholder interaction during the planning phases of the project. Monthly reference group webinars have been held to elaborate issues around the creation of the digital ecosystem. Within the webinars we have presented finding and results of the work as we have proceeded. The webinars have been thematic, focusing on specific themes each month. They have provided for a venue whereby stakeholders can give instant feedback on the planning and user need collection process.

> **1 Compleap Webinar Tuesday June 19th at 9:30 - 10:30.**
> **Topic: CompLeap introduction**
> **Summary:** What we want to achieve with the CompLeap project.
>
> **2 Compleap Webinar Thursday September 2018 6th at 9:30 - 10:30.**
> **Topic: CompLeap introduction to our digital tool**
> **Summary:** Introduction to the CompLeap's prototype development.
>
> **3 Compleap Webinar Tuesday October 2018 16th at 9:30 - 10:30.**
> **Topic: Learning Analytics**
> **Brief summary:** What is learning analytics and why we need such in the development of CompLeap prototypes? By Egle Gendrimiene, University of Oulu.
>
> **4 Compleap Webinar Wednesday November 2018 28th at 9:30 - 10:30.**
> **Topic: Open Badges**
> **Brief summary:** By Sanna Brauer (Oulu University of Applied Sciences) and Erik Van den Broek project partner (DUO) introduction to the Open badges at EU level and from the Finnish perspective. Discussion about how open badges can be included in CompLeap prototype work.
>
> **5 Compleap Webinar December 2018 19th at 9:30 - 10:30.**

Topic: Agile Service Development in CompLeap project
Brief summary: CompLeap's service developer from Solita introduced the prototype development process with reference to the agile working method and functionalities that HTML prototype enable to service development.

6 Compleap Webinar January 2019 16.1. at 9:30 - 10:30.
Topic: Linkage with National Koski degree data with CompLeap
Brief summary: EDUFI's expert responsible for the Koski-service described the content of the national degree, credit and course register. Discussions about the usability of Koski degree data in CompLeap prototype.

7 Compleap Webinar February 2019 26.2. at 10:00 - 11:00
Topic: Demo on final HTML-prototype and plans for the Beta prototype
Brief summary: What did we achieve by the HTML prototype and where we are heading now.

8.2 Interactive Demo Sessions

In the year-end 2018, interactive webinar sessions were launched to support better validation process in relation to the prototype development. The demos were opened to have more hands-on window for the CompLeap stakeholders and associate partners to follow and discuss the concrete choices and decisions of the prototype development.

Demo sessions schedules in the project's workspace:
https://wiki.eduuni.fi/display/csccompleap/Demos+for+the+prototype+development

1 Compleap prototype session 2018 20.11. at 9:30 - 10:30.
Topic: Soft skills and EU's key competences
Brief summary: How soft skills, non/in-formal skills should be categorised in CompLeap prototype – Would EU's 8 life-long key competences suit in this?

2 Compleap prototype session 2018 5.12. at 9:30 - 10:30.
Topic: Open badges - case example from Scouts of Finland
Brief summary: What are the plans to show open badges in the CompLeap competence profile. Scouts Finland as a case example.

3 Compleap prototype session 2019 8.3. at 10:30-11:00.
Topic: Beta prototype – what's new?
Brief summary: How does the Beta prototype look like in the first iterations. Developers show the first outcomes.

8.3 Educational Fairs

In parallel with webinar and demo sessions organised online, we have participated twice in national educational fairs in Finland with a project stand. In these fairs, we have offered for the end users and stakeholders an opportunity to test our prototype and give feedback.

1   **January 25-26st 2019: Educa 2019: Teaching — communication and interaction, Helsinki Finland.**

2   **February 8th2019: Guiding counsellors' annual days, Turku Finland (Åpopäivät).**

ORIGINAL DELIVERABLE

Description of the action:

Within WP2, EDUFI has lead the planning and definition process of the prototypes to be developed during the course of the project. The planning has involved the mapping of relevant user profiles, the defining of user needs, and creating user scenarios and detailed instructions for the use of service designers and UI and UX designers.

Through the adoption of iterative service design methodology user needs are continuously tested with selected key target groups, affecting and changing user scenarios and developer instructions.

Outcome of the Action:

Through this action we have created detailed descriptions of the services to be tested as well as detailed the timeline for the iterative service design and prototype development to be continued throughout WP2 and WP3. As an outcome we are better equipped to develop useful learner-centred services that fit into the architecture and fulfil concrete and identified needs of both the users and reference groups.

The CompLeap prototypes will be developed through four phases:

5. **Mapping architecture** – initial mapping of current service framework
6. **Mock up prototype** – visual screenshots of the modules for testing a concept (ongoing)
7. **HTML prototype** – more functionalities than a mock up proto
8. **Beta-pilot** – in a sense works almost like a final product

User validation is ongoing in all the phases of prototype development.

Description of CompLeap User Scenarios and Guidelines Provided for Developers

CompLeap -project; EDUFI

Contents

Introduction

The aim of the service design process is to create **modular digital services** to guide individuals in their competence development, through utilising learning analytics.

The CompLeap project team has chosen to adopt **iterative service design methods** whereby **the guidelines for developers are compiled and gathered with users along the whole continuation of the project. Iterative design is a design methodology based on a cyclic process of prototyping, testing, analyzing, and refining.** Based on the results of testing the most recent iteration of the design, changes and refinements are made.

With continuous end-user and guidance counsellor testing and validation, we are acquiring deeper understanding of users and their current needs, and avoiding mismatch in service design.

Phases of development

The prototype development is divided into four segments. User validation is ongoing in all the phases of prototype development.

9. **Mapping architecture** – initial mapping of current service framework
10. **Mock up prototype** – visual screenshots of the modules for testing a concept (ongoing)
11. **HTML prototype** – more functionalities than a mock up proto
12. **Beta-pilot** – in a sense works almost like a final product

Mapping Current Architecture
In the initial phases of the project, the key needs for new services in the learner path were identified through mapping the service architecture and stakeholder needs analysis. The area circulated in red in the figure below was the one where most needs for new services were identified.
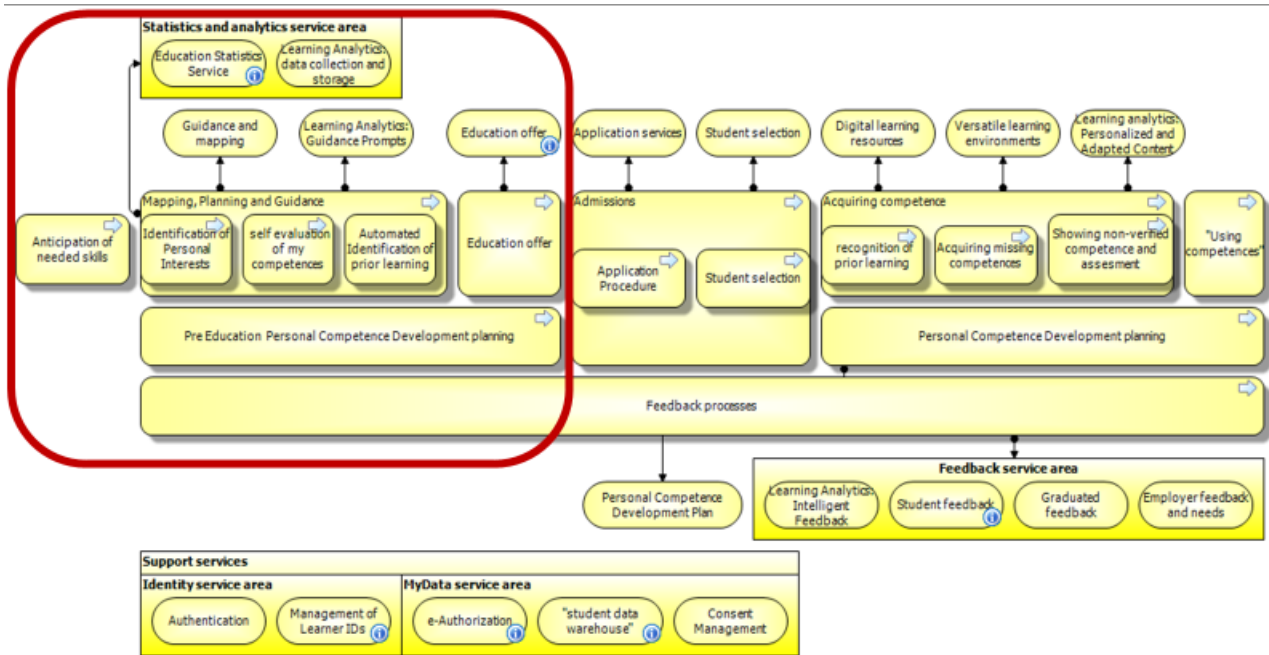
Figure 1: Service Architecture in Learner Path

Following the preliminary mapping and analysis phase, a timeline for the iterative service design was laid out and discussed with the service designers.

Phase	Nro	Actions	Timeline
Planning	1	**Defining Stakeholder Needs** - Stakeholder workshops - Consolidating stakeholder content	April 2018 – June 2018
	2	**Creating Preliminary User Scenarios**	
	3	**Creating mock-up prototypes**	May 2018

	4	**Collecting user needs**
		- user interviews with preliminary html protos
		    o Gradia Jyväskylä 11.6.
		    o Reference Group webinar 19.6.
		    o Survey to Reference Group after 19.6.
		- redesigning user needs
		- Piloting Plan 20.6.
			Late May - early June 2018

Requirements and User Needs	5	**Redefining user scenarios** - further specifictions for user profiles - creating user scenarios	May 2018 – June 2018
	6	**Defining html prototype functionalities and requirements** - architecture - Piloting Manual for Gradia groups (and other associate partners)	August 2018

	7	**Creating html prototype based on user needs**	Aug-Sept 2018

	8	**Testing user needs with stakeholders and associate partners**
		- Shadowing, Ohjaamo Helsinki (August)
		- Stakeholder workshops with html protos redesigning user needs
		  o Reference Group webinars 6.9.; 16.10.; 28.11.
		  o Associate partners piloting kick off 18.9. Jyväskylä
		  o Reference Group workshop 10.10.2018 Helsinki (Kick-off for Developers)
		  o Associate Partner workshop, OSAO (October)
		-
			August – October 2018

	9	**Technical preparations and procurement** - based on EDUFI procurement requirements	October 2018
Design and implementation	10	**Going through design and specifications with selected developer team** - specifying timetables and consolidating ideas	November 2018
	11	**Programming prototypes** - Agile methods with user validation - Mid Term Seminar 4.12. Helsinki (with Associate partners) - Survey to Reference Group after 4.12.	Nov -December 2018
	12	**Functional prototypes on platform**	February 2019
Deployment and evaluation	13	**User testing of functional prototypes** - testing in conjunction with yhteishaku and application to higher ed 14.-28.3. - Associate partner workshops in Salpaus and Redu	Feb-April 2019
	14	**Making necessary changes**	April -May 2019
	15	Piloting Prototypes w Gradia - Piloting plan Collecting user feedback	April – Sept 2019
	16	Reassessing analysis and design - Impact evaluation study	July– Oct 2019
Documentation	18	Creating all neccessary documentation • EU reporting Technical documentation	Oct – Nov 2019

Developing First Mock-up Prototype

For the first Mock-up phase of prototype development, user needs for three identified service areas were compiled in the Stakeholder Seminar in Helsinki 9.4.2018. As a result of user and developer feedback three modules have been identified for further user testing:

1. Personal Competence Profile Module (independent module)
- User can use strong identification or none
    - Strong identification opens access to national databases and registers (if available) and their data
    - Compiling a profile using only user generated data is possible, especially for NEET and youth without registration methods
- Competence Mapping solutions for compiling information on ambitions, non-formal skills and interests
- Linkages to comparing educational opportunities and employment opportunities

2. Compare Module (independent module)
- offers personalised suggestions on educational opportunities based on the data from the personal competence profile – i.e. learns from user input.
- Can like or dismiss offered opportunities, whereby the system learns and suggests new intelligent options

3. Learner Map Module (dependent on 1 and 2)
- Personalised visualised map of future possibilities based on personal competence profile and compare module data
- Utilises data from Competence Profile and Compare Module

These modules are updated in the Mock-up Invision Prototype:
https://invis.io/5KKEQGC2JN4

User Scenarios for Mock-up

In the very early days of the project a preliminary user scenario was created to guide the mapping and definition process. This user scenario was then used to seek further input from both users and reference groups. later it was translated into concrete steps for the creation of an Invision Mock-up prototype.

User scenarios for the planned modules are constantly updated on the CompLeap Wiki -pages:
https://wiki.eduuni.fi/display/csccompleap/User+scenarios

> The *service flow* begins with the learner's need to develop their competence or to access educational opportunities.

> Inside the digital framework, the learner is guided to register themselves using strong identification. This is a prerequisite for accessing necessary data from national registries.

> The next step is to map the learners' competencies. Data on prior education and training is collected from national registries and from the learner themselves. In addition, information on the learner's hopes and wishes on the acquisition of competencies is gathered from the learner themselves. The data is collected from a national registry on educational records (KOSKI). Base information on possible educational opportunities and their educational contents are found from a national registry of educational curricula (ePerusteet). Together these functionalities comprise the service of Competence Mapping.

> The data the learner has inserted in the service of Competence Mapping is utilized to refine the educational opportunities offered to them. In this section/phase, the learner can insert additional search criteria, e.g. limit the search to a certain geographical area. If economic forecast data on the employment levels of certain educational fields is available, the learner

could also possibly see these as a part of the attributes of the educational opportunity. Together these functionalities comprise the service of Comparing Educational Opportunities.

If the learner finds favourable and interesting opportunities, they can move on to inform the educational institute of their interest towards the educational opportunity. Once they apply, they transform from a learner into an applicant. The applicant can apply to multiple institutions and multiple study programmes.

The learner can also leave an open application, which is not targeted towards any specific institution, but is instead sent to every institution providing education in accordance to the learner's criteria. In this phase, additional and necessary information can be collected from the learner (via possible forms and questionnaires). The information of the applicant is saved and collected into a student admission register. If the applicant is accepted, information on the acceptance is also save into the student admission register. In addition, the educational institutes themselves can search for open applications. Together these functionalities comprise the service of Expression of Interest.

The following user scenarios were subsequently identified for the primary Mock-up prototype. These were gathered and are constantly modified on the basis of user needs.

Creating a Competence Profile
1. User signs into service using secure electronic identification
2. user creates basic personal profile and opts to connect to national registers
3. the users verified competencies are collected from national registers
       - the user opts which public services are included in the profile (e.g. Koski, Työmarkkinatori)
3. The prototype creates suggestions for competences
4. the user begins to compile competence profile through guided questions
       - information on employment
       - information on hobbbies

5. AI creates and visualises a preliminary personal competence profile for the user to see
6. the user can add the elements they wish to see in the personal competence profile and the AI learns and provides new competencies relating to previous selections

Sketching a Career and Dreams Profile
1. User completes personal motivation and competence tests
2. User gains visualised information on career goals and dreams
       - what kind of work you are looking for
       -what kind of setting you want to work in
       - what kind of subjects you are interested in
3. User adds relevant test results to personal profile

Seeing opportunities relating to your personal profile
1. User has created a useful competence profile
2. User sees possible education opportunities
3. User can select to see employment, training and apprenticeship opportunities
4. User gains access to filters and selects those relevant to him/her
       - geographical
       - length

- language
- degree / non-degree
- level

Finding opportunities for missing competencies
1. User begins to use "KoulutusKipinä" (location based social education opportunity matching tool = LBSEOMP)
2. Based on algorythms user gets proposals for interesting opportunities (inlc. education, training, and employment)
3. User saves most inspiring opportunities into own Personal learner plan profile

Discussing opportunities in moderated environment
1. User can discuss with peers who have received similar opportunities
2. User can contact different kinds of (existing) career counselling services
      - clicking and calling e.g. Ohjaamo

Application to education/employment
1. User can move to application app
2. User can send application to selected recommendations

Inform of interest
1. User can inform of interest to inspiring education opportunities
2. User clicks"I'm interested" – box
3. data is collected on education needs, and email is sent to provider

Identified Users and Needs

The EDUFI and University of Oulu task force on developing the CompLeap Learner Path has identified key users and created profiles around them for user and stakeholder testing.

Group	Registration	Prior data about the person	Challenges	User profile – specific needs	Need of guidance?	Who is impacting the decision making?
Immigrant	No possibility of strong registration	No prior data in registries or documentation	Lacking language competence, issues with understanding educational, social and societal concepts, possible lack of motivation, skills mismatch	Clarity, simple language, multilingualism, visualisations, multi-channel, support should be easily accessed	Strong	Family, parents, guidance actors (councellors etc)
NEET	Possibility of strong registration	Transcripts of study records, employment application data, educational application data	No motivation, learning difficulties, former bad experiences with education	Ease-of-use, compelling interface/use, gamification, ease of access to information, clarity and simple language	Strong	Coaching, workshops, youth work centres
In the midst of a career shift	Possibility of strong registration	Prior data	Motivation external, circumstantial changes, looking for a new direction	Relevance and validity of the data	Medium	Employability, employment situation (local, national, field-specific), coaching
Currently employed (~30-50yo)	Possibility of strong registration	No prior data in registries, some documentation formal competence	Circumstantial change, updating vocational competence	Relevance and validity of the data	Minimal	Employer, career development

Basic education graduate	No possibility of strong registration	Transcripts of records	Unclear of their educational/vocational direction	Visuality and ease-of-use	Medium	Family, parents, guidance actors (councellors etc), friends

User Profiles for User Testing

The following user profiles are used to guide testing sessions with guidance professionals.

JOUKO

- Age: 21
- Work: Unemployed
- Education: Vocational, Electrician
- Family: Dog
- Location: Ilomantsi, Finland

BIO

- Jouko has completed his upper secondary vocational education and has earned an electrician's degree. He has worked in short-term part-time jobs not directly in the field of his acquired competences. Currently he is unemployed. He has started to think that he might need to acquire new skills and competences because there are no jobs matching his interests or skills. He also has no interest in leaving his current surroundings. Jouko has used osaan.fi –website for trying to recognize, what kind of formal competencies he already has, but it left him confused. He has also a lot of different kinds of work experience from a variety of short-term jobs he has had after his graduation, but he doesn't know how to describe his experience properly in work applications.

GOALS

- Finding work near his home
- Would like to get a full-time, permanent job
- Possibly getting new skills and competences
- Finding out his place in world

CONCERNS

- Wouldn't like to leave his hometown
- No new educational or learning options available nearby
- current education not enough to gain employment
- Not interested in short term jobs

INTERESTS

- Plumbing
- Mathematics
- Programming
- Technology and gadgets

KAISA

- Age: 19
- Work: Unemployed
- Education: Vocat., Arts
- Family: Mother and a brother
- Location: Liminka, Finland

BIO

- Kaisa has always been into drawing. She has completed an art school in her home town after she completed her basic (primary + lower secondary) school. Art-school studies were challenging but she felt at home with other like-minded, artistically gifted people. Now after graduation Kaisa feels overwhelmed with what to do and how to make ends meet. Kaisas has explored different options with her friend for career, work and study opportunities through the website kunkoululoppuu.fi. They have found some interesting ideas to connect her drawing skills with coding or marketing, but she does not know where she could study that kind of things.

GOALS
- To find an inspiring job
- Be remembered by her skills
- Be a source of inspiration for others

CONCERNS
- People and social situations are difficult
- Almost always gets fired from jobs
- Does not know how to use her skills and education to get employed

INTERESTS
- Drawing
- Design
- Tinkering and similar hobby crafts

MARYAM

- Age: 23
- Work: Unemployed
- Education: Upper secondary school
- Family: Married
- Location: Tampere, Finland

BIO

- Maryam escaped the civil unrests and wars in her own country when she was 18 years old. After spending few years in Germany she got acquainted with Matias, a Finnish fellow to whom she eventually got married and moved to Finland. Maryam believes that cracking any culture requires the knowledge of the language, so she enrolled to a Finnish course immediately. She would love to get a part-time job and then continue studies in the field of IT and/or healthcare. Maryam has tried to find some information about education from opintopolku.fi, but she is not sure, which education would be the best for her compared to her experiences and previous education.

GOALS
- Settle in Finland
- Learn Finnish language
- Find a stable work place

CONCERNS
- People in Finland seem distant
- Can't get any interviews for part-time jobs
- It is hard to find friends independently

INTERESTS
- Information Technology
- Health care
- Music

LIISA

- Age: 16
- Work: -
- Education: Basic grades 1-10
- Family: Mother, father
- Location: Kotka, Finland

BIO

- Liisa will soon finish her 10th grade studies. During school, she did not show so much interest towards school and therefore her grades were not sufficient for any upper secondary level studies last year. During the summer, she decided to start 10th grade and work-hard the whole year to raise her grades. During that year, she got really interested about chemistry, but because her lower success in previous years, she couldn't progress in it as much as she would have wanted. Now she is frustrated of what to choose. Would general upper secondary education be too difficult? What to study in vocational education then? Liisa has tried mesaatio.fi to investigate data about different educational fields.

GOALS

- Decide what to study next

CONCERNS

- Not enough knowledge to make a right choice
- Uncertain about her skills as a learner
- Funding for secondary education, because parents are poor

INTERESTS

- Chemistry
- Travelling

RAIMO

- Age: 55
- Work: Unemployed
- Education: Engineer
- Family: Divorced with 2 kids
- Location: Helsinki, Finland

BIO

- Raimo has been unemployed since the mid 1990s.. He has had short-term and fixed-term positions, but no permanent contracts have been awarded. Has kept himself occupied by volunteering in his children's school as a general house keeper and guard at recess breaks. Participates in a lot of job coaching activities. Feels frustrated at the system and doesn't feel it is helping him. Similarly is not sure if his competencies match for any jobs available in 2018. He has tried to find out through osaan.fi, what kind of competencies he has and kept his technological skills updated through short-term website courses.

GOALS

- Help kids get through school
- Find meaningful pursuits in life
- Bring up his kids well

CONCERNS

- Been unemployed for long
- Doubts whether will ever find employment
- Retirement age is approaching
- Feels that modern working culture is distant for him

INTERESTS

- MOOCs
- Volunteer jobs at school
- Old cars