



Digital transformation: from adult-education institution to Digital Education Enterprise

O1 Digital Education Enterprise business model and processes

April 28, 2022



Project data	Project title	Digital transformation: from adult-education institution to Digital Education Enterprise
	Project acronym	Digital Education Enterprise
	Project number	2021-1-BG01-KA220-ADU-000026986
	Project coordinator	E10142644 SBC School of business competences Ltd.
	Partner organizations	E10268592 Mobiliz Bilgi ve İletişim Teknolojileri A.Ş. E10209310 INSTITUTO TECNOLÓGICO DE CANARIAS, S.A. E10032547 DOREA EDUCATIONAL INSTITUTE WTF E10150580 BUSINESS & PROFESSIONAL WOMEN CR Z.S.
	Project result title	O1 Digital Education Enterprise business model and processes
	Document category	Methodologies / guidelines
	Within responsibility of	[A] SBC, [C] Partners <u>Key to division of work:</u> R = Responsible – those who do the work to complete the task A = Accountable - the one ultimately answerable for the correct and thorough completion of the deliverable or task C = Consulted – those whose opinions are sought I = Informed - Those who are up-to-date on progress
	Date of issue	April 28, 2022
	Version NN.NN	01.03
	Audience	Project partners, public under ERASMUS+ rules
Purpose and motivation	O1 is a business model of a digital education enterprise and set of business processes which make this business model work. O1 aims to be archetype of a digital adult education organization, commercial- or in-company, that is built on the digital enterprise pillars, integrates Fourth Industrial Revolution digital technologies, and specific digital teaching/learning means. O1 is designed to be a goal to change the traditional business model of an adult education organization to digital one. This is a profound change and it requires reengineering of the organization which means fundamental rethink of the business model and radical redesign of business process. Target groups: This project partners; Adult education and training organizations – commercial and in-company; Trade and/or industrial association, employers, and labour agencies searching for curricula aligned to their specific needs and labour market opportunities; Start-ups; VET and other educational organizations interested in new digital education business models	
Scope	The “O1 Digital Education Enterprise business model and processes” comprises: O1-T1 Value propositions designs to the target groups O1-T2 Business model designs which deliver O1-T1 value propositions O1-T3 Design of processes that implement Digital Education Enterprise business model O1-T4 Behavior design – guidelines for the formation of learning habits when working with digital learning products	



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Chapter 1: Introduction to the purpose

The project “Digital transformation: from adult-education institution to Digital Education Enterprise” has 4 outputs:

O1 Digital Education Enterprise business model and processes

O2 Digital Transformation Plan to reengineer the usual way of adult training and education to the Digital Education Enterprise business model

O3 Business model for aligning the adults training programs to the needs and opportunities offered by the labor market and specific organizations upon producer’s model

O4 Digital training manual how to implement O1 and O3 business models, and O2 Digital Transformation Plan and processes

This report is dedicated to the project’s first output - O1 Digital Education Enterprise business model and processes. O1 comprises a business model of a digital education enterprise and set of business processes which make this business model work.

O1 aims to be archetype of a digital adult education organization, commercial- or in-company, that is built on the digital enterprise pillars, integrates Fourth Industrial Revolution digital technologies, and specific digital teaching/learning means.

O1 is designed to be a goal to change the traditional business model of an adult-education organization to digital one. This is a profound change and it requires reengineering of the organization which means fundamental rethink of the business model and radical redesign of business process.

Apart from the project partners, the project results are of interest to adult-education and training organizations – commercial and in-company; trade and/or industrial association, employers, and labour agencies searching for curricula aligned to their specific needs and labour market opportunities; Start-ups; VET and other educational organizations interested in new digital education business models.

Chapter 2: Terms and definitions

Business model

A business model describes the rationale of how an organization creates, delivers, and captures value. (1)

Baseline

A snapshot that is used as a reference point.

Business Model Canvas

The Business Model Canvas is a strategic management and entrepreneurial tool. It allows you to describe, design, challenge, invent and pivot your business model. (2)

The Business Model Canvas is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported License. To view a copy of this license, visit:



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Business process

Set of interrelated or interacting *activities* which transforms inputs into outputs

Configuration item

CI

Element that needs to be controlled in order to deliver a service or services

Service

Means of delivering value for the customer by facilitating outcomes the customer wants to achieve

Service catalogue

Documented information about services that an organization provides to its customers

Value proposition

The company's core promise of benefits to clients and prospective clients. (3)

Value Proposition Canvas

The Value Proposition Canvas is a business tool that helps you tackle the core challenges of every business – creating compelling products and services customers want to buy. (4), (5)

Chapter 3: Methodological framework

The O1's methodological framework for development is depicted in Figure 1.

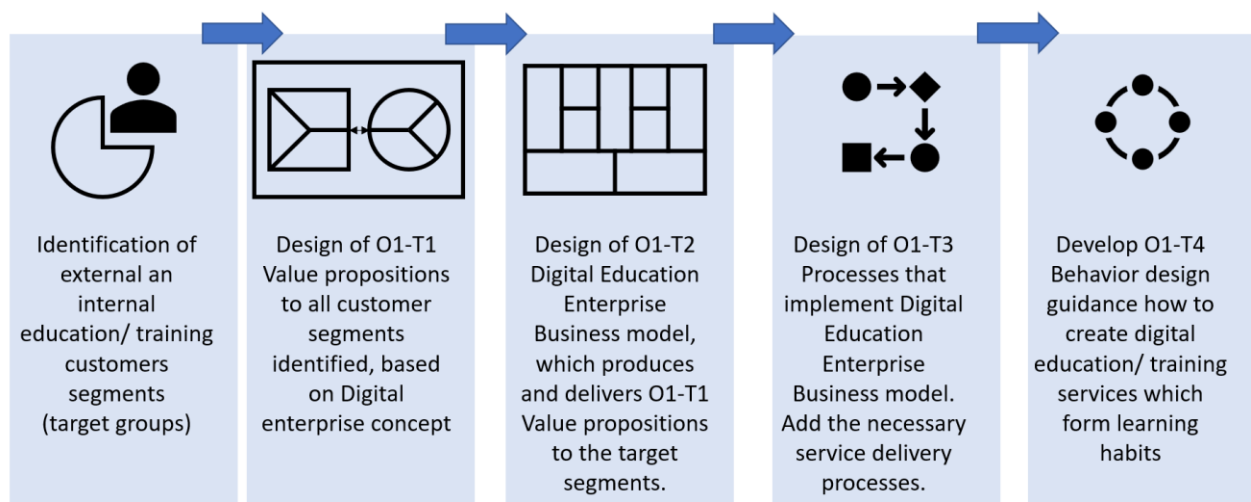


Figure 1 O1's methodological framework for development



The O1's development process starts with the identification of external and internal education/training customer segments (target groups).

Then 4 main tasks are performed:

O1-T1 Value propositions design

For the purpose The Value Proposition Canvas was used. The applied methodology is described in (4).

For each target group was developed:

- Customer Profile, that presents target group understanding,
- Value Map, that presents how O1 intends to create value for that target group,
- The Value map's products, services, pain relievers and gain creators that fit to Customer Profile's jobs, pains, and gains.

The result is Value proposition for the relevant target group.

O1-T2 Business model design

For the purpose The Business Model Canvas is used. The applied methodology is described in (1).

- A business model was developed that produces and delivers the value proposition for each target group, applying the principles of Reengineering the corporation manifesto (1),
- This business model was created on the digital enterprise pillars (6) and considers appropriate digital technologies like IoT, Big Data, Analytics, Mathematics for data analysis and support of decision making, as well as Automation, monitoring and management of business processes. The last are typical digital technologies of the Fourth Industrial Revolution.
- BG01-KA226-VET-095108 project's results like digital pedagogy and tools were integrated into the Model.

The result is Digital Education Enterprise business model.

O1-T3 Design of processes that implement Digital Education Enterprise business model

For the purpose:

- Processes that realize Digital Education Enterprise's key activities were designed and modelled by Business Process Model and Notation
- Digital services management processes were designed that comply to ISO 20000 - Information technology - Service management – Part 1: Service management system requirements.

The result is a complete set of Digital Education Enterprise business model's processes.

O1-T4 Behavior design

For the purpose behavior design approach (7) was applied to provide guidance for development of learning habits forming digital education products.



Chapter 4: Education/training customer segments, types and forms of training

The external and internal education/training customer segments identified are depicted in Figure 2.

	Students
1	High school students
2	VET school students
3	Dual education students
4	College students
5	University students
6	Polytechnic university students
	Corporate sector
1	Corporate clients
2	Employees
3	55+ years old
4	Customers seeking training in the use of the company's products
5	New employees
6	Employees with no previous work experience
	Individuals
1	Individuals seeking training on their own
	Specific groups
1	Youth
2	Women
3	Individuals with fewer opportunities
4	Unemployed
5	Refugees of war
6	Migrants
7	Jobseekers

Figure 2 Education/training customer segments

The customer segments fall into 4 categories:

- **Students** - containing 6 customer segments,
- **Corporate sector** - containing 6 customer segments,
- **Individuals** – containing 1 customer segment,
- **Specific groups** - containing 7 customer segments.

Each of these categories has its own specifics. For instance, the “**Students**” category is focused on the delivery of curricula usually accredited by a state agency, but the “**Corporate sector**” provides company’s products training to its clients.

At the same time some of the customer segments have very similar characteristics. For instance, **High school students’** and **VET school students’** segments have a lot of common disciplines like mathematics, but excel in the areas of acquiring practical skills.



The typical categories of education/trainings offered by the adult-training institutions to the identified customer segments, Figure2, are listed in Figure 3.

	Category of education/training
1	Official curriculum accredited by a state agency
2	Dual-education
3	Job orientation program
4	Onboarding training
5	Qualification program on specific profession
6	Upskilling
7	Reskilling
8	Building technical skills
9	Building business skills
10	Building soft skills
11	Certification training
12	In-company training
13	Open course
14	Problem oriented training
15	Training users
16	Training trainers
17	Product training
18	Trainings according client's specification

Figure 3 Typical categories of education/training

The matrix in Figure 4, matches the customer segments and the trainings they use most often. These results are based on questionnaires answered by the project partners, on analysis of trainings provided under specific projects or requests, as well as on statistics of the education/training services they deliver or use. Because of the fact partners in total have more than 35,000 business clients and thousands of individual trainees, we believe that the results are sufficiently representative.



	Category of education/training → Customer segment ↓	Official curriculum accredited by a state agency	Dual-education	Job orientation program	Onboarding training	Qualification programs on specific professions	Upskilling	Reskilling	Building technical skills	Building business skills	Building soft skills	Certification training	In-company training	Open course	Problem oriented training	Training users	Training trainers	Product training	Trainings according client's specification
	Students																		
1	High school students	•		•														•	
2	VET school students	•	•	•		•			•									•	
3	Dual education students	•	•	•		•			•									•	
4	College students	•		•					•									•	
5	University students	•		•					•									•	
6	Polytechnic university students	•		•					•									•	
	Corporate sector																		
1	Corporate clients				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	Employees					•	•	•	•	•	•	•	•	•	•	•	•	•	•
3	55+ years old						•	•			•		•		•		•		
4	Customers seeking training in the use of the company's products											•		•		•		•	•
5	New employees				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
6	Employees with no previous work experience			•	•	•	•	•	•	•			•	•				•	
	Individuals																		
1	Individuals seeking training on their own	•	•			•	•	•	•	•	•	•		•				•	
	Specific groups																		
1	Youth	•	•	•	•	•	•	•	•	•		•		•				•	
2	Women	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3	Individuals with fewer opportunities	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4	Unemployed			•	•		•	•	•	•	•			•					
5	Refugees of war			•	•	•	•	•	•				•						
6	Migrants			•	•	•	•	•	•				•						
7	Jobseekers			•	•		•	•	•	•		•	•	•				•	

Figure 4 Customer segments and relevant education/training services



The typical forms of education/training, using classical and digital technologies, are listed in Figure 5.

	Forms of training
1	Face-to-face tutor-led (in the class room)
2	Tutor-led via some internet communication platform
3	e-learning (via web-site or mobile app)
4	Blended (Face-to-face + e-learning)
5	In-company
6	Workshops
7	Webinars
8	Self-service learning (via web-site or mobile app)
9	Standalone apps
10	Bite-size learning
11	VR-based learning
12	AR-based learning

Figure 5 Typical forms of education/training

The results shown in Figure 2 to Figure 5 baseline the value propositions to the target customer segments.

Chapter 5: Value propositions

Value propositions to the target customer segments, Figure 2, are presented below. The Value Proposition Canvas is used for this purpose (4), Figure 6. Colored “sticky notes” are used to visualize the ideas.

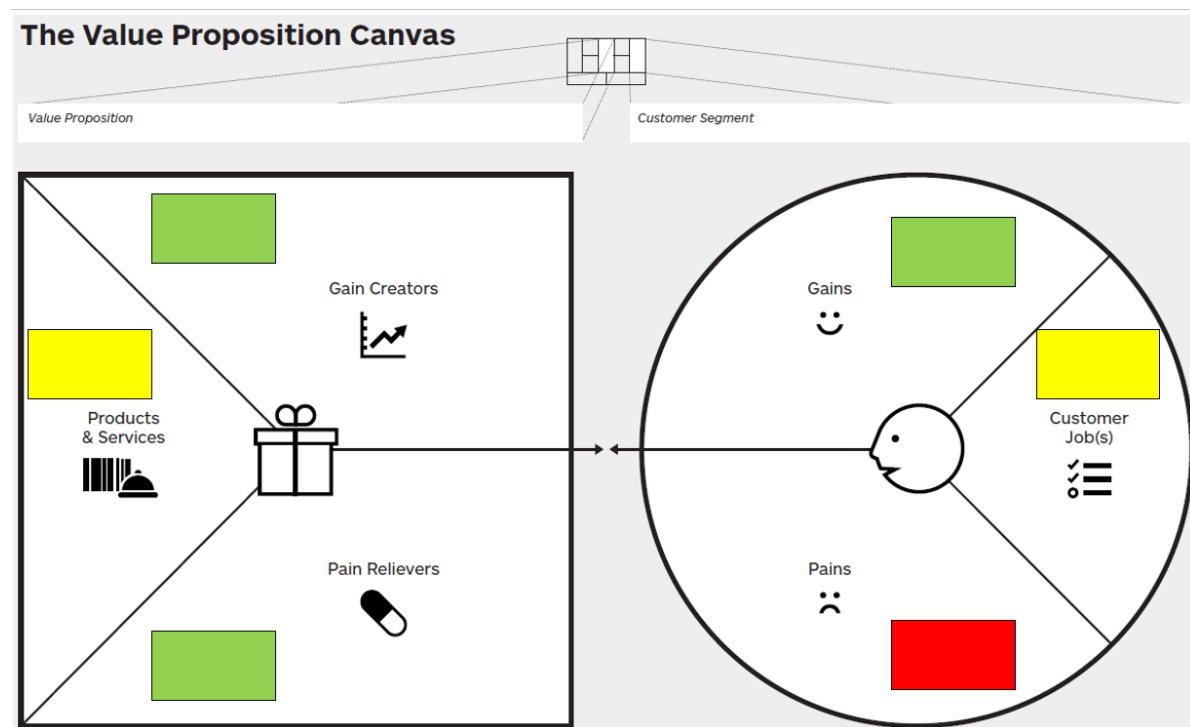


Figure 6 The Value Proposition Canvas



Yellow – for the Customer jobs and Products and services, Red – for the Pains, Green – for the Gains, Gain creators and Pain relievers.

The right side of the Value Proposition Canvas represents the customer segment's profile. The left side represents the value map - the value which the vendor proposes to the target customer segment.

The Value Proposition Canvases for the target segments, enlisted in Figure 2, are depicted on the next figures. They were designed based on the matrix in Figure 4, a number of brainstorming sessions, and consideration of the digital enterprise pillars.

5.1 Students

The following students' segments fall into this category: High-, Vet-, Dual education-, College-, University-, and Polytechnic- students. The value propositions to these segments have a lot of common elements, but have specifics too.

High school students' segment

The Value proposition to the High school students' segment is depicted in Figure 7.

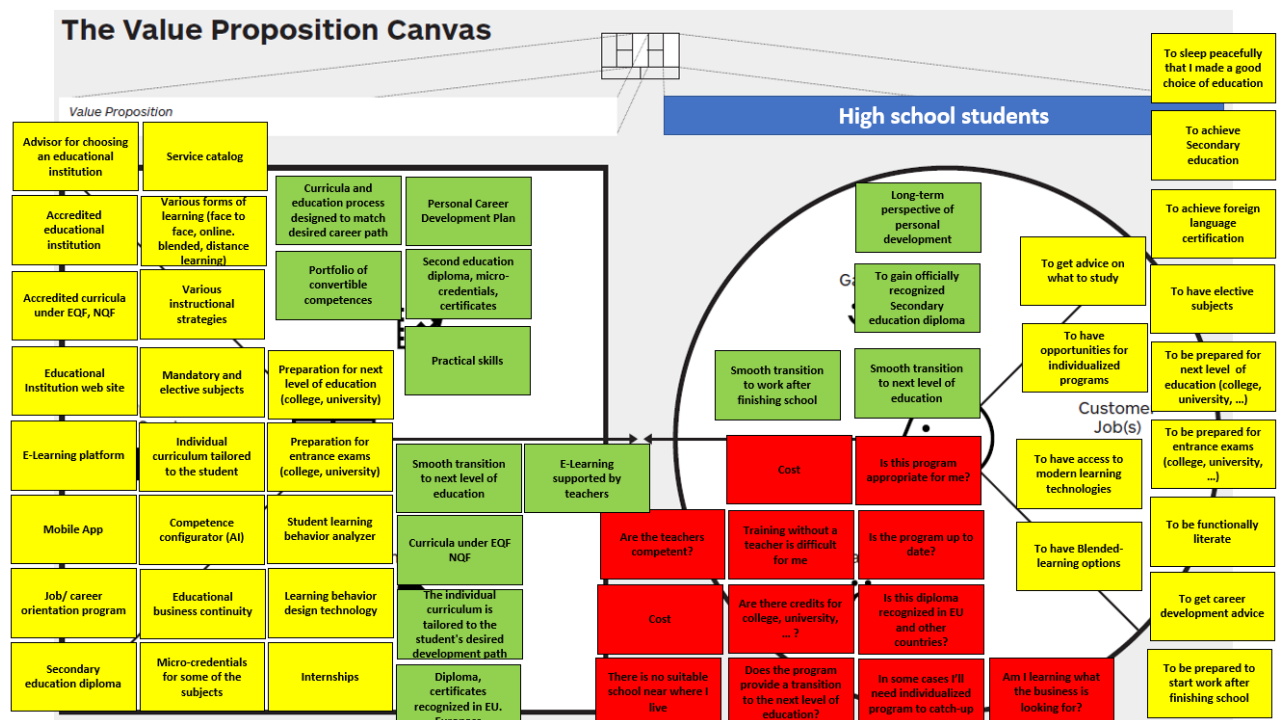


Figure 7 The Value Proposition to the High School student's segment



VET school students' segment

The Value proposition to the VET school students' segment is depicted in Figure 8. It is very similar to the High school students' value proposition but there are important differences:

- The variety of curricula in vocational schools is much greater than in the ordinary schools due to the variety of professions,
- The VET schools have to provide workshops equipped with appropriate industrial equipment to allow students "touch" real machines and develop practical skills,
- The VET students more often have internships in industrial plants,
- Some occupations require certifications. That's why the VET students sit certification exams (e.g. to achieve the right to practice as welder, to operate heavy machines, etc.).

These differences should be considered when designing the digital VET school's value proposition and business model. The requirement to practice with real production machines creates restrictions – the student must be in a physical workshop. But at the same time allows to use sophisticated digital technologies, like VR, AR and IoT.

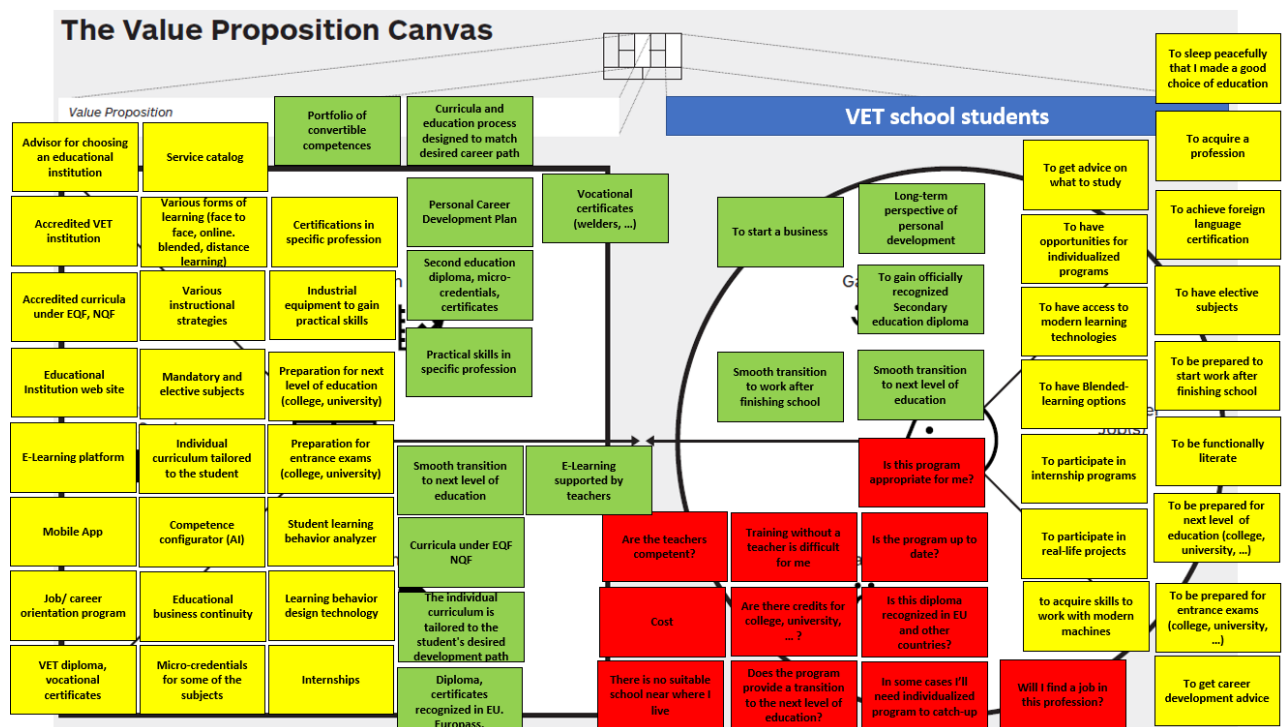


Figure 8 The Value Proposition to the VET School student's segment



Dual education students' segment

The Value proposition to the VET school students' segment is depicted in Figure 9. It is similar to the High school students' and VET school students' value propositions too with an important difference – it is based on dual-education curricula and industrial plants are engaged in the practical training of the students.

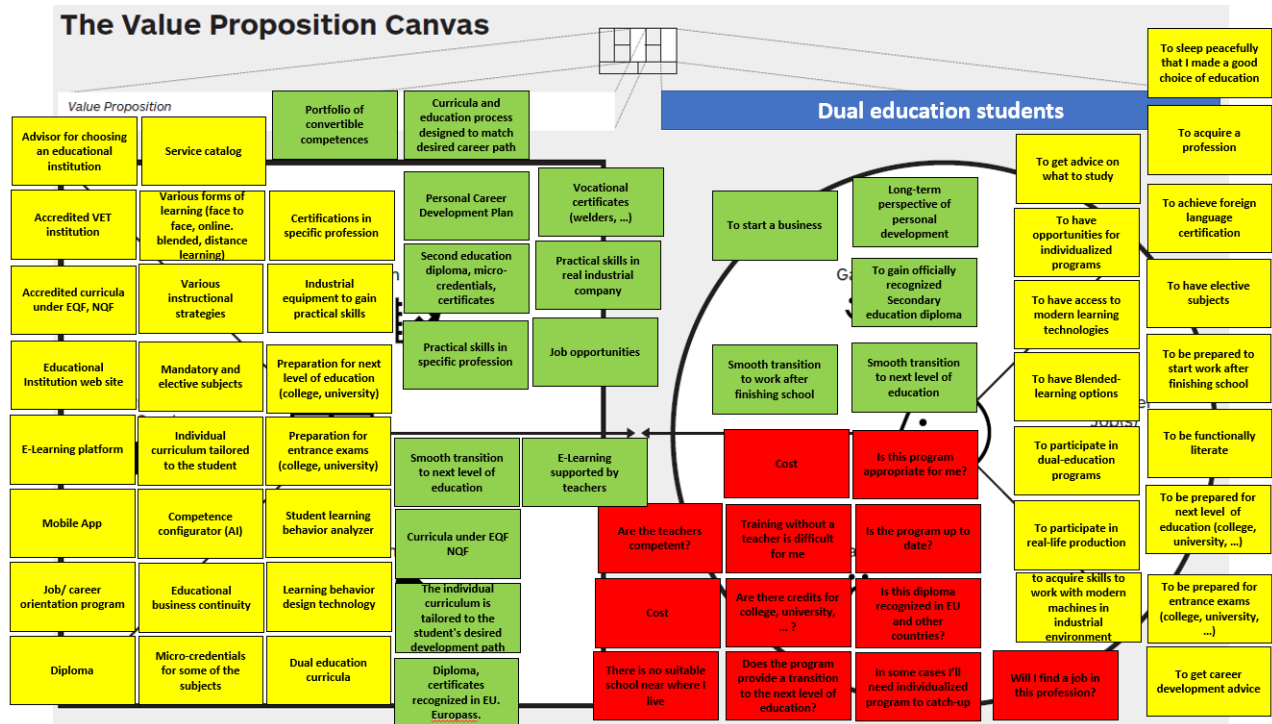


Figure 9 The Value Proposition to the dual education student's segment

College students' segment

The Value proposition to the College students' segment is depicted in Figure 10. The Value proposition to the College students' segment may comprise all of the elements of the High school students', VET school students' and Dual education students' value propositions, depicted in Figures 7 to 9. The difference is in the EQF/NQF levels. Many students of this segment study and work at the same time. This places specific requirements on the value proposition, namely to provide more flexible study agenda. One of the solutions is the blended form of learning.

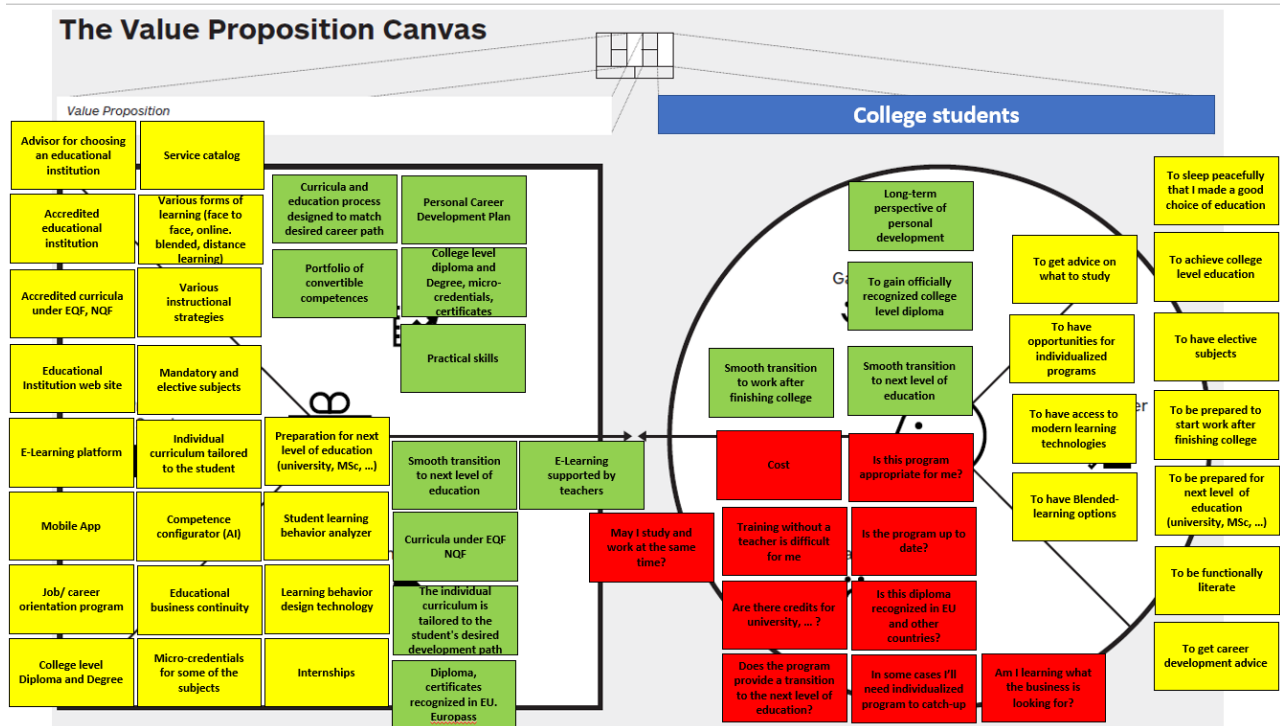


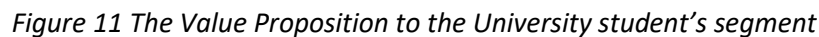
Figure 10 The Value Proposition to the College student's segment

University students' segment

The Value proposition to the University students' segment is depicted in Figure 11. As above, it may comprise all of the elements of the value propositions to High-, VET- and Dual education schools, and to Colleges' students, Figures 7 to 10. The difference is in the EQF/NQF levels. The university students may achieve bachelor, master and Ph.D. diplomas and degrees. Usually they have to work on term papers, thesis, and do participate in projects.

In recent years due to the lack of qualified people, companies often hire students from the lower courses. Such kind of students are required to learn technologies that businesses really need. This places specific requirements on the value proposition – to provide variety of selective subjects and specialized training programs which fit the needs of the industries. Because some of the universities' lecturers do not have real experience in any industry, the value proposition to the university students may include trainings delivered by employees of business organizations.

Provision of R&D platforms, research laboratories and thesis' themes on subjects that businesses are interested in, as well as for research brings value too.



The Value proposition to the Polytechnic students' segment is depicted in Figure 12. As above, it may comprise all of the elements of the value propositions to High-, VET- and Dual education schools, College and Universities' students, Figures 7 to 11. The difference is in the focus on engineering topics.





5.2 Corporate sector

The following corporate sector's segments fall into this category: Corporate clients; Company's employees; the specific segment of 55+ years old employees; Customers seeking training in the use of the company's products; New hired employees and Employees with no previous working experience.

Corporate clients

The Value proposition to the Corporate client's segment is depicted in Figure 13.

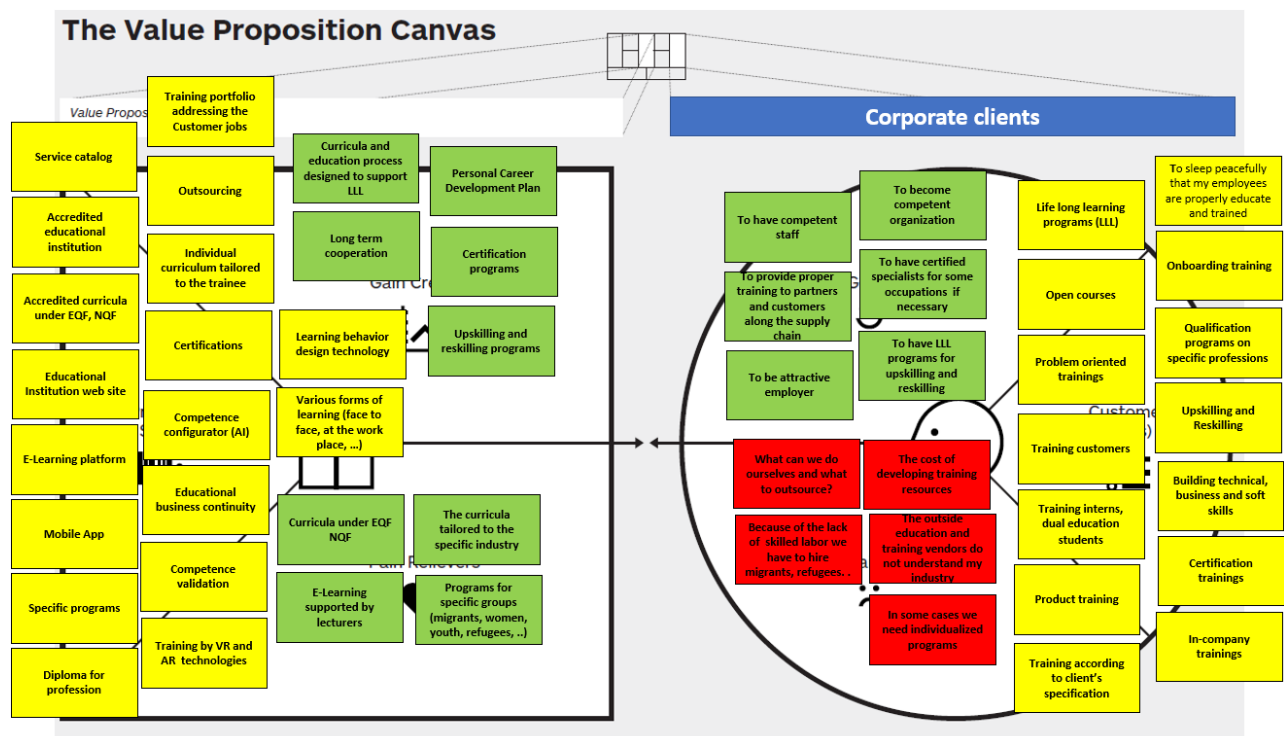


Figure 13 The Value Proposition to the Corporate client's segment

The companies have specific needs of education and training. They have to train customers, their own employees, specific groups of employees, interns, dual-education students. This requires variety of curricula, training delivery channels and partnerships. At the same time there are employees less experienced in the digital technologies, thus, the usual form of training will remain.



Employees

The Value proposition to the company's Employees segment is depicted in Figure 14. Here are the training and education opportunities company has to provide by its own resources or organize through buying training services.

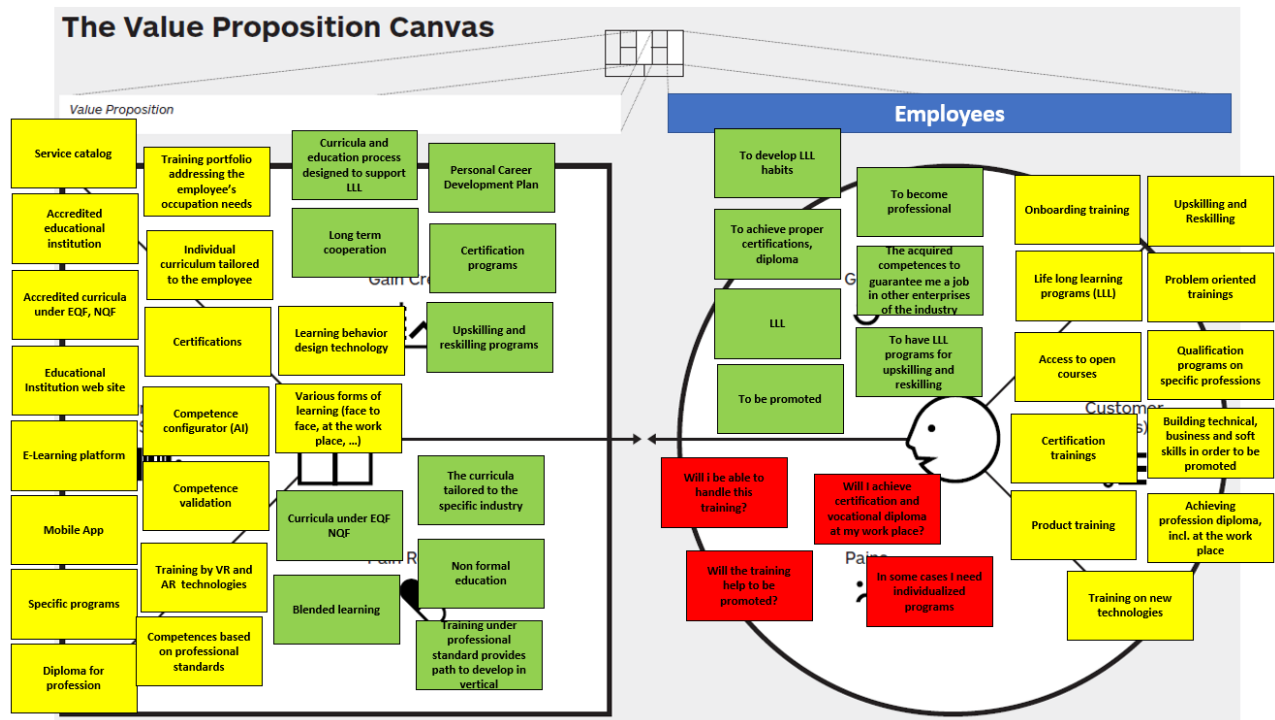


Figure 14 The Value Proposition to the company Employees' segment

55+ years old

The Value proposition to the 55+ years old's segment is depicted in Figure 15. This is a specific sub-group of company's employees whose age is over 55 years. A lot of organizations in EU have implemented policies for optimal use of human resources. Part if these policies is to prolong the professional life of the employees and workers. The specificity is that these 55+ y.o. individuals are directed to easier jobs, QA positions, or to play roles of mentors for younger workers. Thus, in addition to the value proposition to the Employees segment, the 55+ y.o. are provided with the opportunity to join reskilling/upskilling programs. Part of these programs are the specific skills to be a mentor and work with youth. Because some of the 55+ y.o. are less experienced in the digital technologies, the usual form of training will remain.

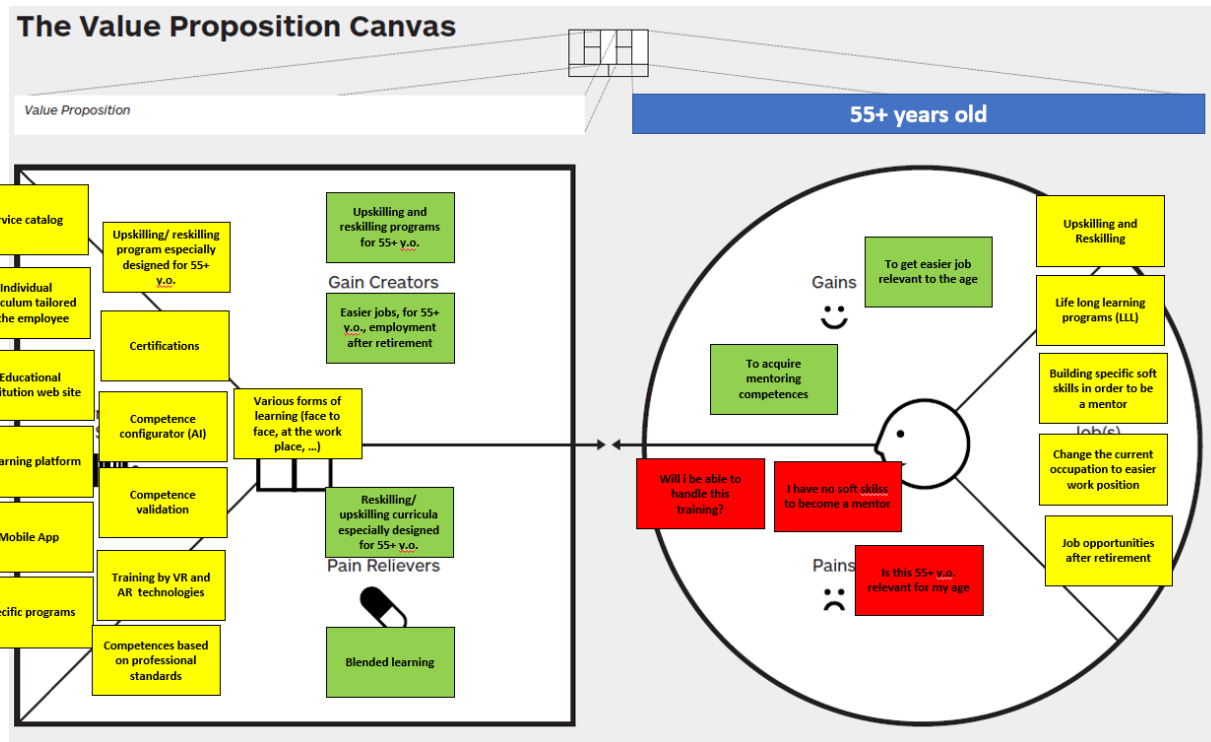


Figure 15 The Value Proposition to the 55+ years old' segment

Customers seeking training in the use of the company's products

The Value proposition to the Customers seeking training in use of company's products' segment is depicted in Figure 16.

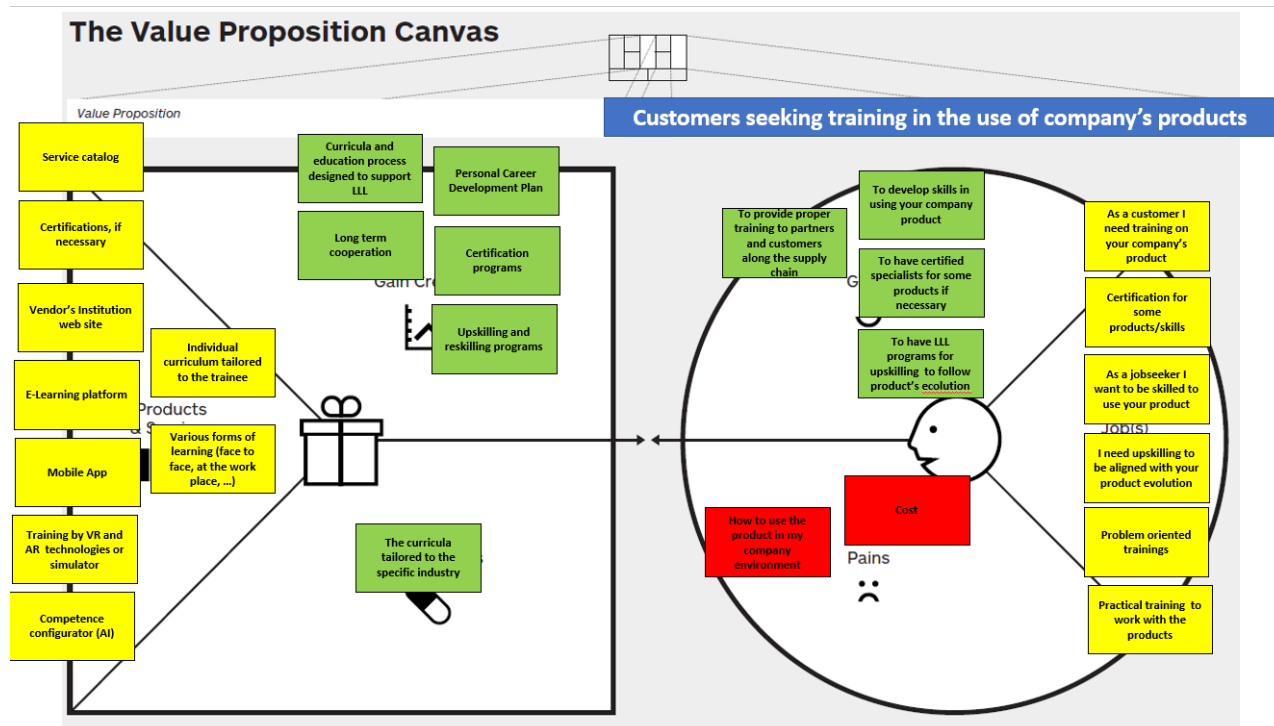


Figure 16 The Value Proposition to the Customers seeking training in use of company's products



New employees

The Value proposition to the New employees' segment is the same as for the Employee's segment, Figure 14. The special thing is that the training of the new employees starts with an onboarding program. The goal is to represent the organization to the new hired employee and to train her/him to achieve the minimal set skills for the occupation. Further, to join the new employee to the upskilling and personal development program. In some cases, a coach/mentor can be assigned to this newcomer. Increasing number of companies uses VR and AR technologies for this purpose.

The VR and AR are used to represent the organization to any kind of students and jobseekers. These are used in remote mode to attract potential candidates, or for onboarding employees who will work from distance or home office.

The essence of this Value proposition is the correct configuration of the program.

Employees with no previous work experience

The Value proposition to the Employees with no previous work experience' segment is the same as for the Employee's and New employees' segments, Figure 14. The special thing is that the training of such kind of employees must comprise basic skills and competences.

Again, the essence of this Value proposition is the correct configuration of the program.

5.3 Individuals

Individuals seeking training on their own

The Value proposition to the Individuals seeking training on their own segment is depicted in Figure 17. These individuals could be motivated to search for training by variety of reasons. It is not possible to cover all the scenarios. But, in general, the Value proposition can contain all elements of the Students category and some elements of Corporate sector.

The customer profile depicted in Figure 17 is based on our experience in VET and Adult training, on the analysis of thousands of training requests and feedbacks from conducted trainings.

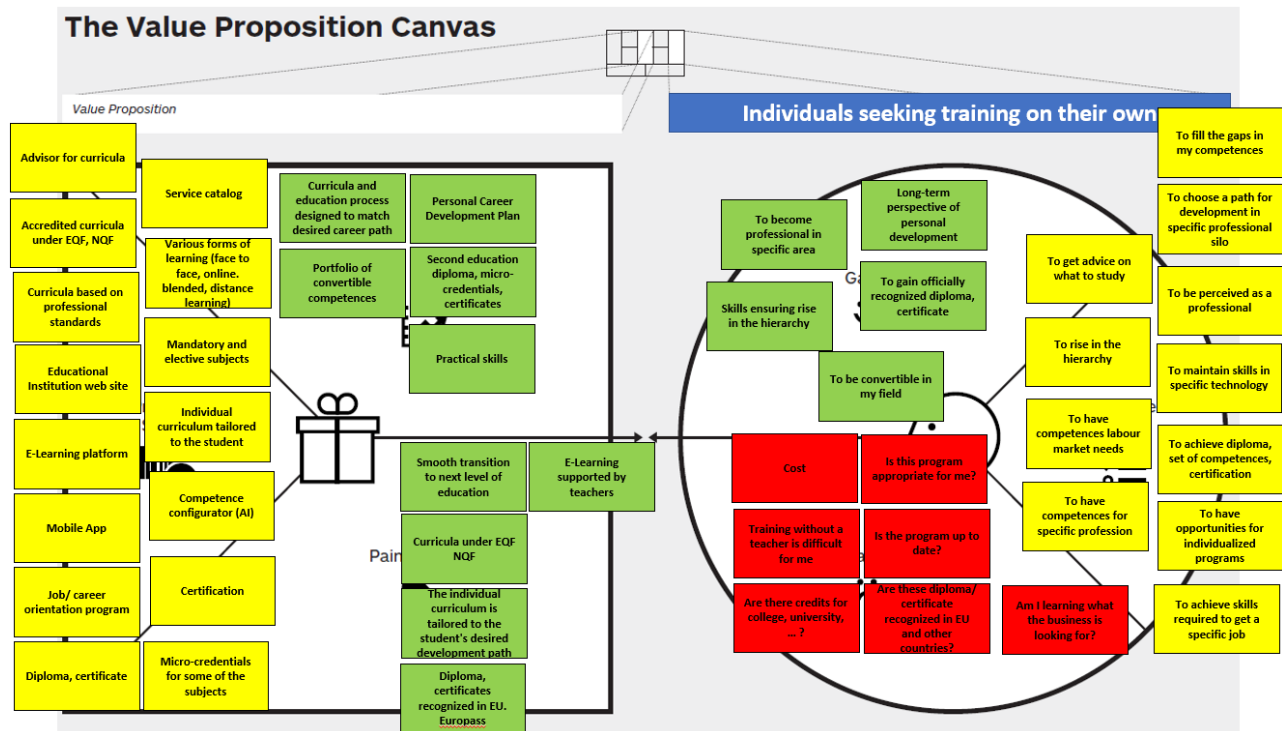


Figure 17 The Value proposition to the Individuals seeking training on their own

Essentially, this proposal stands in that it helps the individual to choose the right configuration of competencies for specific profession or technology. At the same time, it provides the competences necessary to rise in the corporate hierarchy.

5.4 Specific groups

The customer segments in this category are Youth, Women, Individuals with fewer opportunities, Unemployed, Migrants and Refugees of war.

The value propositions to these segments can comprise almost all elements of the value proposition to Students, Corporate sector, and Individuals segments. But there are some specific challenges which must be addressed by the business model which produces and delivers these value propositions to the correspondent segment.

What is specific to these segments?

The youth:

- Prefer to use mobile devices,
- The cost of the training could be a problem for the youth, thus the financial part of the business model should be properly designed – to provide cheap or free training, pro-bono training, and the like,
- Eventually have problems with the learning habits.

Women:

- The number of women with humanitarian skills is greater than that with technical, and STEM education and skills. There is a skilled women shortage for occupations in the industry. Thus, the



value proposition to the women should be focused on upskilling programs and motivation to change their career path to more technical occupations.

- The training agenda for women should be more flexible, because women are more involved with the household and children. In particular reskilling programs will be appropriate for women after maternity.
- Focus should be put on the specific management skills development, which will help women to rise in corporate hierarchy.

Individuals with fewer opportunities, disadvantaged, unemployed, jobseekers:

- There can be physical restrictions for them to get education and training, because of illness, lack of finances, living in remote places,
- As for the youth, the lack of finances, computers, mobile devices and access to internet could be a problem too, thus the financial part of the business model should be properly designed.

Refugees of war, migrants:

- The language education should be priority; thus, the educational institutions should consider this issue. The digital technology can help in this direction, by automatic translation, text to voice, proper mobile apps, and the like.
- Agile and individualize curricula which will help the refugees and migrants to catch up the missed material,
- Validation of competences,
- Programs for cultural integration.

A value proposition that brings these capabilities together is presented in Figure 18.

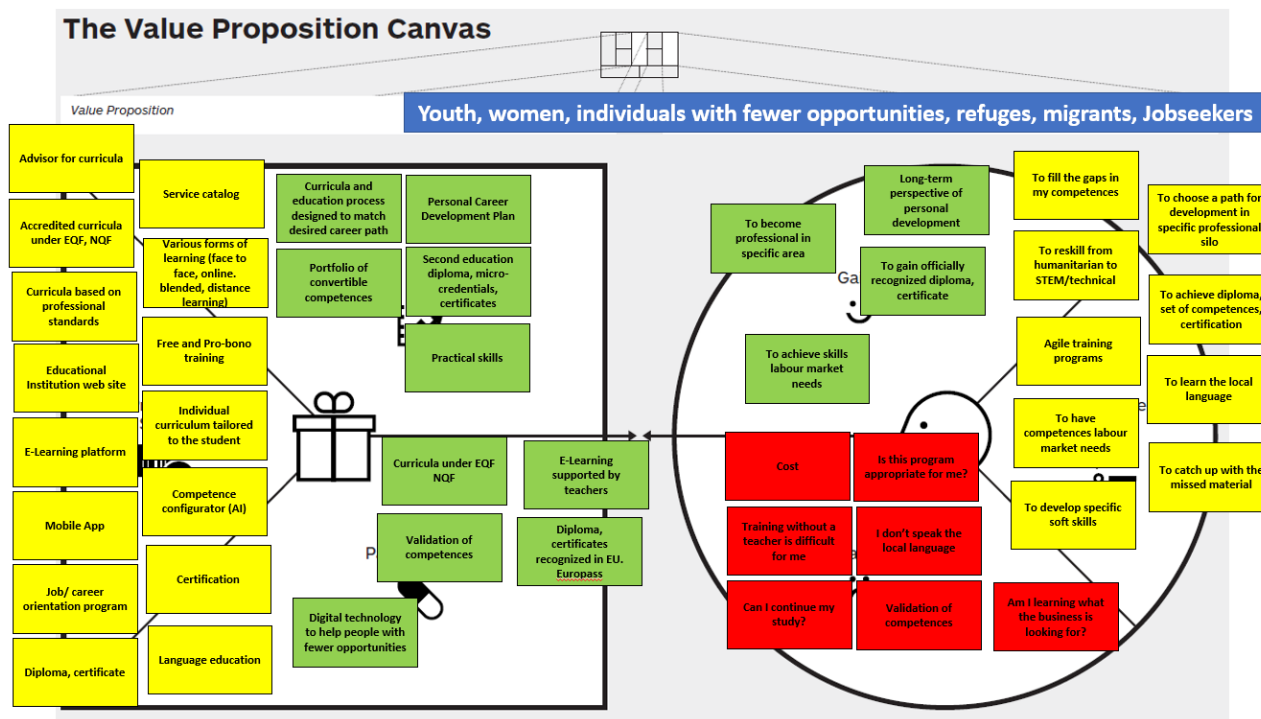


Figure 18 The Value proposition to the Specific groups' segment



5.5 Value Proposition: Conclusions

The analysis of the value propositions, described above in sections 5.1 to 5.4, and the insights summarized in Figure 4 Customer segments and relevant education/training services, allow us to rearrange the customer segment, Figure 19. The rationales are:

(1) The Customer profiles (Customer Jobs, Pains and Gains) of the customer segments in the “Students” category have a lot in common. The same is true for the Value maps (Products & Services, Pain Relievers, Gain Creators). The “Youth” segment’s customer profile is very close to the “Students” one.

The differences are in scope of the curricula, the EQF/NQF levels these curricula address, and in the forms of practical training. But there are no fundamental differences in the logic of the curriculum configuration algorithm and in the methods of its delivery, including the digital technologies.

Therefore, we will simplify the task and further work with a single Customer segment “Students” for the customer segments enlisted in this topic. The overall value proposition to this customer segment is depicted in Figure 20.

N.B.

The elements of the value propositions depicted in the next figures are derived from Figure 7 to 18, but the elements are prioritized and the most important, according to the rationale given in this document, are presented.

(2) The Customer profiles of the customer segments in the “Corporate sector” category have a lot in common too. The same is true for the Value maps. An exception represents a single Customer segment in this category – “Customers seeking training in the use of the company’s products”.

Therefore, we will work with two customer segments in this category:

- “Corporate”, which represents the value proposition the organization provides to its employees, interns, and specific subgroups of new hired, employees with no previous work experience and 55+ years old.

The “Women” and “Jobseekers” customer segment’s profile fits to the “Corporate” too.

The value proposition to the “Corporate” segment is depicted in Figure 21. This value proposition is based on:

- Organization’s own training resources,
- Co-operation with VETs, Dual-education and Higher Education Institutions (HEIs), and
- Purchase of training services.

N.B.

We left “Training customers” in Figure 21, but the value proposition to Customers seeking training in the use of the company’s products is presented with more details in Figure 22.

- “Customers seeking training in the use of the company’s products”. The value proposition to this segment is depicted in Figure 22.

(3) The value propositions to the segments “Individuals seeking training on their own” and “Specific groups” do not change and are as depicted respectively in Figure 17 and 18.

	Specific groups
3	Individuals with fewer opportunities
4	Unemployed
5	Refugee of war
6	Migrants

Figure 20 The Value Proposition to the Students segment

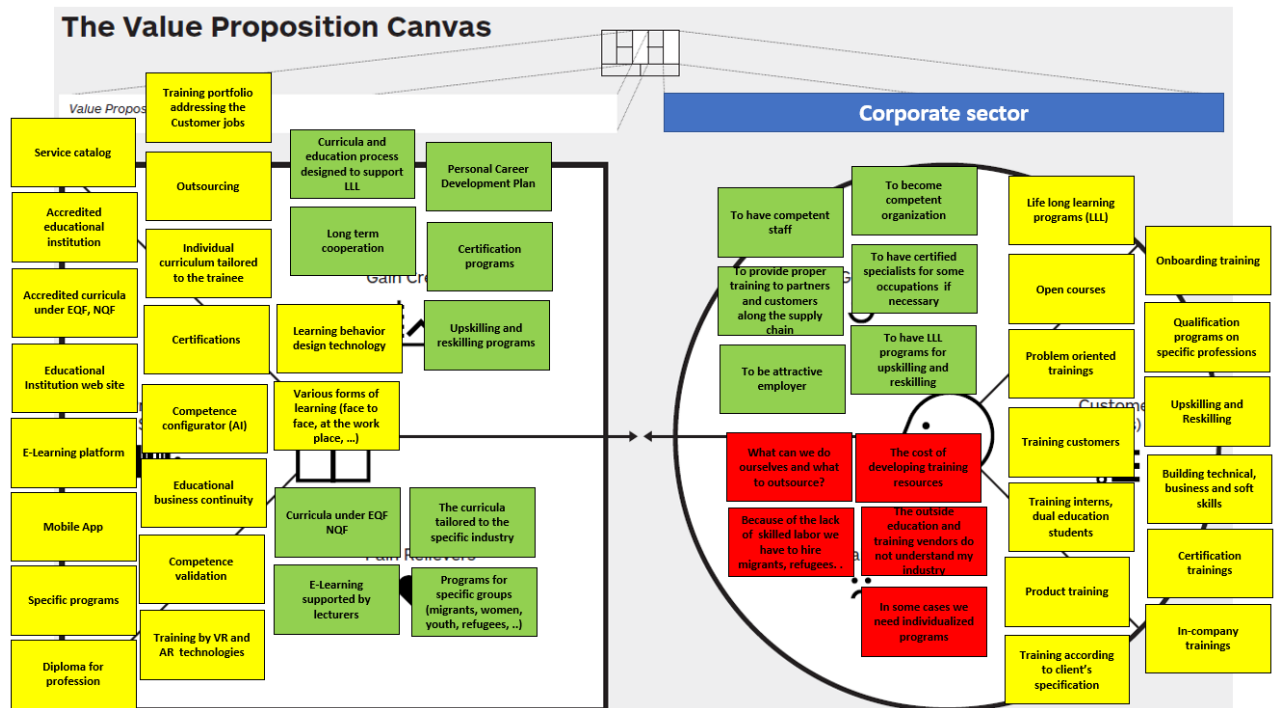


Figure 21 The Value Proposition to the Corporate segment

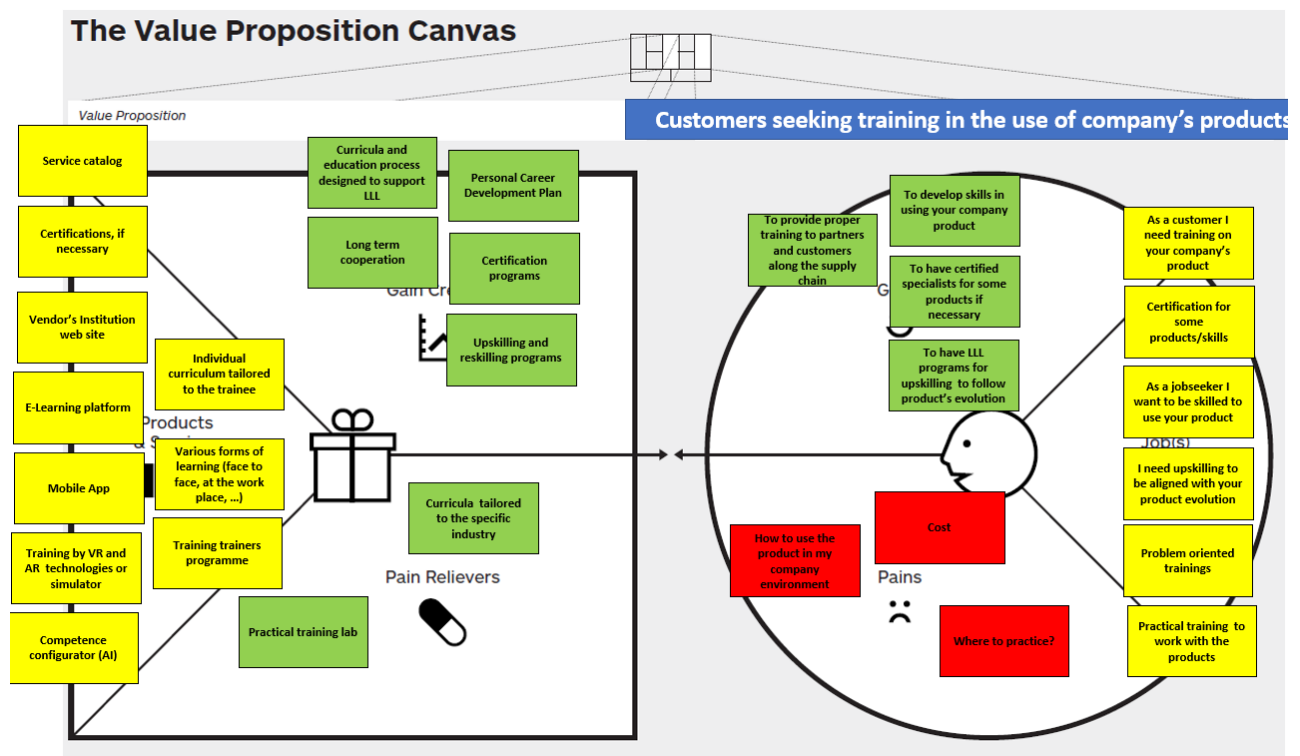


Figure 22 The Value Proposition to the Customers seeking training in the use of the company's products segment

Chapter 6: Business models

Business models that produce and deliver the value propositions to the four customer segments summarized in Figure 19 are presented below. For each of these business models the elements of their nine blocks are explained. The elements that turn educational institutions into a digital education enterprise are indicated and explained.

The Business Model Canvas is used for this purpose (1), (2), Figure 23.

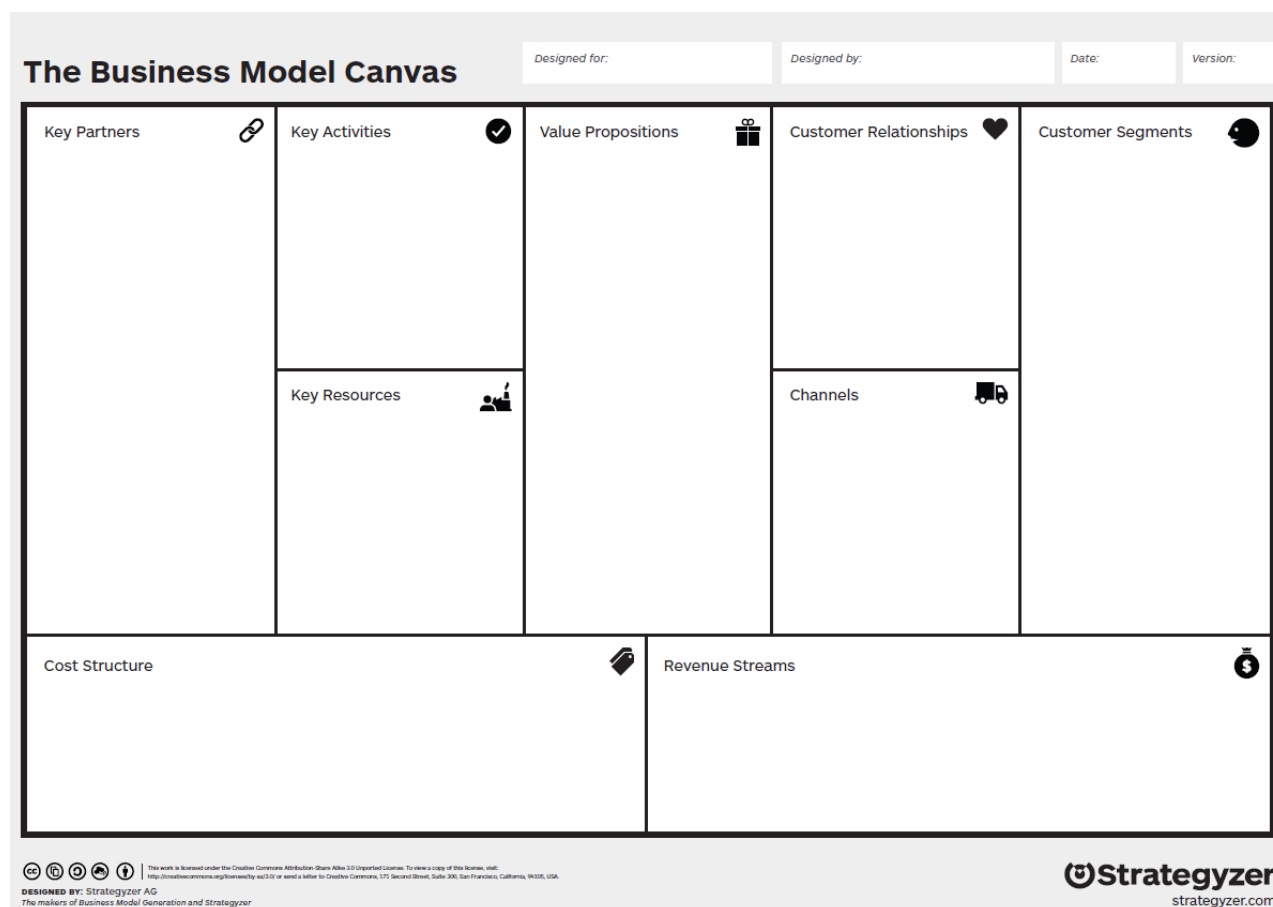


Figure 23 The Business Model Canvas

6.1 Students

A business model for the customer segment “Students” is presented in Figure 24.

Customer segment

The customer segment “Students” comprises:

- High school students,
- VET school students,
- Dual education students,
- College students,
- University students,
- Polytechnic university students,
- Youth.



This customer segment's profile and value map are described in Figure 20.

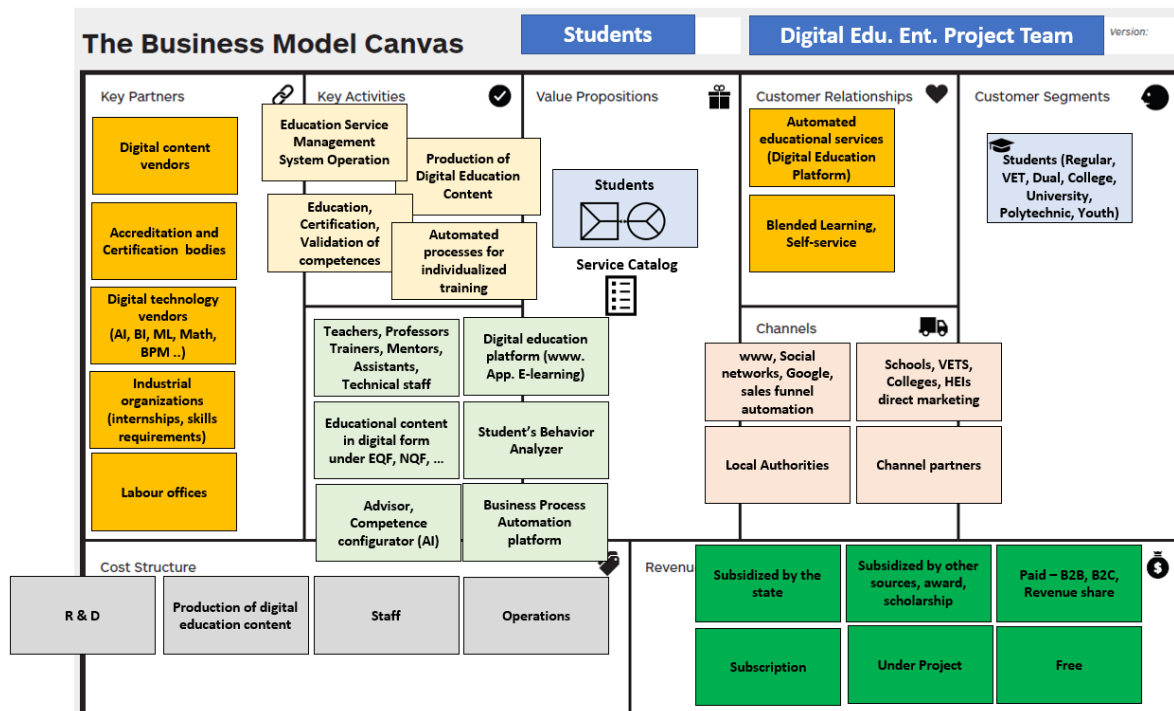


Figure 24 A business model for the customer segment “Students”

Value propositions

The value proposition to the customer segment “Students” is presented in Figure 20. It brings together value propositions to the representatives of that customer segment. If an educational institution decides to use this business model to carry out a digital transformation, it must choose the appropriate elements and adjust them to its activity.

Service catalogue

Note that the Service catalogue is an element of all value propositions in this document.

The educational institutions provide educational and training services. It is good practice for educational services to be presented in service catalogues. The Service catalogue represents documented information about services that an organization provides to its customers. Of course, the Digital Education Enterprise’s Service catalog must be in a digital form.

It is important to define the configuration of each educational/training service in the Service catalogue. For this purpose, it is necessary to define the configuration items of each service. “Configuration item” is an element that needs to be controlled in order to deliver a service or services.

Simple example of a Service catalogue and educational services configurations can be seen in Figure 25.

Note that there are two categories of services in Figure 25: core services and supporting services. Usually the end customer will see the core services, but the rest supporting services will be visible for the supporting personnel – digital education enterprise administrators, service desk, etc. Structuring Service catalogue is a matter of business decision.

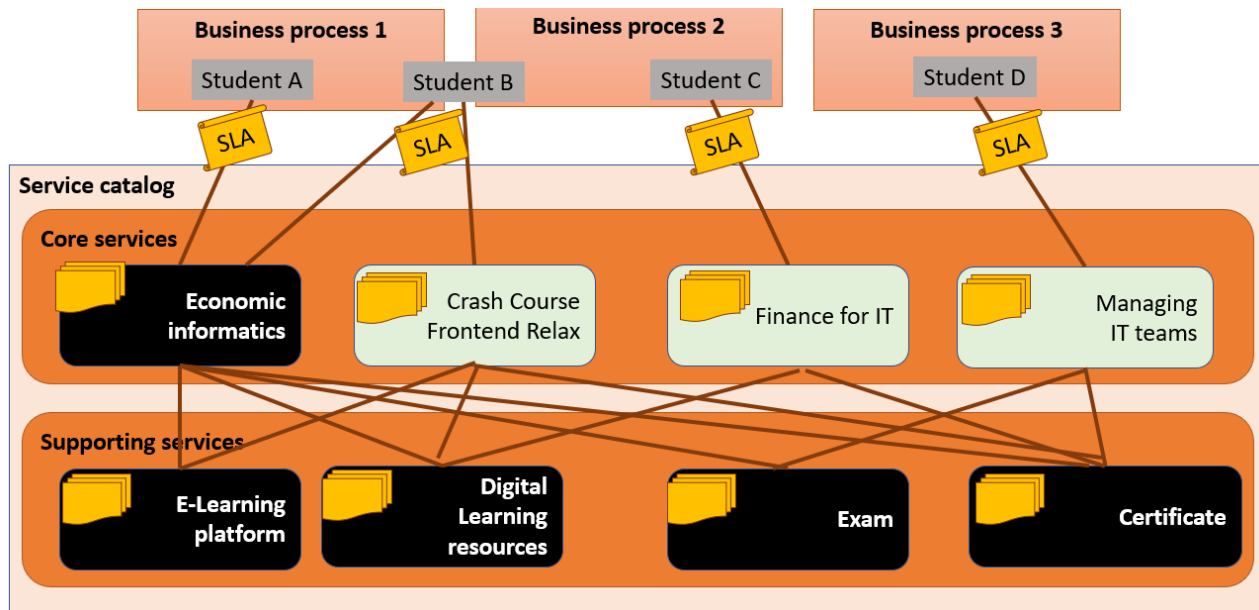


Figure 25 Sample Service catalogue and service configurations

It is good for the digital transformation of a training organization to start with the development of a Service catalogue.

When designing the configuration of the Digital Education Enterprise learning services it is necessary to include appropriate elements that will allow you:

- To realize the digital enterprise concept,
- To implement the value proposition to the correspondent customer segment.

For instance, if you want your Competence configurator (AI), Figure 20, to provide a student with advice for Personal Career Development Plan, you probably will need service configuration items like EQF and the set of competences for each profession according EQF. You may use these profession related sets of competences in many ways. E.g. to compare the current competences of a student to the EQF's and provide the student with list of competences to gather in order achieve specific professional diploma.

Figure 26 provides a list of training service attributes that you can include in the Service catalogue. An “*” marks attributes which usually are mandatory. Part of these attributes shall be visible to general public, the others for the maintenance personnel.

Figure 27 provides list of typical training service configuration items.



Educational service attribute	Description
* Service ID	Unique service ID. You can use QR codes with links to the service
* Service Name	The name of the service. E.g. "Process design and modelling with BPMN", "Learning Management System"
* Service Summary	Short service description and purpose
* Service description	Detailed service description according to your organization style, e.g. curriculum, target groups, topics, training method (in-class, on-line, blended, tutor led, e-learning, ...), duration, price, certificates, credentials, and the like
* Version	Service version
* Vendor	A service can be provided by the educational institution or by a partner
* Service Type	Core/Supporting service
* Service Level Agreement (SLA)	It is a good practice to have SLA for each service. It could be in a form of General Terms and conditions or Commercial agreement.
* Service status	Current stage along the service lifecycle. E.g. "In development", "To be published", "Active", "Will be retired".
Criticality of the service to the business	Critical/ Medium critical/ Non-critical
Hosting Location - primary	The place you host your service, e.g. – Data center, Server, Cloud, Servers farm, Hosting service provider, ...
Hosting location - back	The backup hosting location of your service
Electronic library - 1st original	Link to the electronic library with the master copy of the service
Physical library - 1st original	Address of physical library with master copy of the service
Licenses – quantity and type	e.g. 50, concurrent
Licenses – expiration date	Expiration date/ unlimited
First level support - contact	Service desk contacts
Second level support - contact	Service desk contacts
Supporting services	Links to the supporting services
Interfaces	Links to the service interfaces
Change requests	Links to the change requests
Known errors	Links to the Data Base with known errors
...	...

Figure 26 Sample training service attributes you can use in your Service Catalogue



Educational service configuration item	Comments
Educational institution e-learning platform	e-learning platform web site, link
Curricula	According to EQF, NQF if applicable
Set of competences	Set of competences addressed by the curricula, links to relevant EQF, NQF or other qualifications frameworks. These set can be used to find out how close is a student to achieve diploma for specific profession, or to provide the competence configurator (AI) with data to propose competence development path
Presentations	Training course presentation files in PDF, Google Slides, Open office, and the like formats
Other training resources	Videos, PDFs, Business cases, Examples
Tests	Variants of examination tests, including mock-tests
Learning app	Mobile application, links to a web store
Certificate, Diploma templates	Templates
Digital tools	Digital tools to be used along the training like communication platforms, LMS, text-to-voice synthesizers, players, etc.
Independent examination body	Links to the independent examination body platform
Business processes	Business processes that automate educational service delivery. These can be modeled by LMS or other specific process automation tools.

Figure 27 Sample educational service configuration items

Key assets

The key assets necessary to implement this business model comprise:

The Digital Education Enterprise's personnel

Into this category fall people who develop educational/training content and perform training. These are teachers, trainers, professors, assistants, methodologists, mentors, authors, video and other kinds of digital training content developers – cameramen, voice recorders, editors, producers, screenwriters, etc.

The Digital Education Enterprise is increasingly becoming a software organization. Thus, it will need software engineers, system administrators, and specialists in specific areas like AI, BI, Big Data.

In practical terms, it is important for the educational/training institution to know that such specialists are needed. Some of them, the bigger ones, will have such kind of specialists as their own employees. But the smaller organizations will rely on services.

Digital education platform

In practical terms, it is important for the educational/training institution to design proper architecture for its digital education platforms.

Typical platform elements are:

- Organization's website,
- E-Learning platform,

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- Learning management system (LMS),
- Mobile application,
- Unified Communication solutions that provide video meetings, content sharing, recording, chat-rooms,
- Video channels,
- Secured remote examination functionality to protect against fraud,
- Educational content development tools.

Other useful tools that can help implement the concept of digital enterprises are:

- Text-to-Voice synthesizers,
- Voice-To-Text,
- Automatic translation,
- Voice interfaces.

Even more, these tools will help people who have difficulties with their sight, hearing, pronunciation, typing, dyslexia, etc.

Nowadays video plays an important role in education. That's why tools for preparing training content in video form are important, especially for smaller educational institutions. Almost all of the applications for preparing presentation (like Power Point) allow the user to save presentation in MP4 video format. The Text-to-Voice synthesizers we mentioned above provide teachers with easy to use instrument to prepare voice and subtitles files, to attach them to the slides and save them in video format. Thus, teachers can easily prepare videos with their classes.

Other rapidly developing technologies that enable creation of new forms of educational content are Virtual Reality and Added Reality.

Educational content in digital form

Obviously, the educational content is a key asset of any educational organization. It will be presented as an educational/training service in Service Catalogue or it will be configuration item of some educational service.

For the Digital Education Enterprise purposes, the educational content should be associated with important attributes like:

- EQF, NQF or other framework whose competencies it addresses and the correspondent subset of competences. This information can be used:
 - To provide the student with advices about what to study in order to achieve the whole set of competences for a profession,
 - To develop individual curriculum tailored to the student,
 - To fulfill missing competences, necessary to achieve validation against some legislation – national or of a foreign country, of her/his competences gained by formal and informal training,
 - For career development planning,
 - To find out how close are current student's competences to the requirement of specific profession, one or more, etc.
- Typical training course elements:
 - Curricula,
 - Summary,
 - Target groups,



- Accreditation body if there is any,
- Credits,
- Training schedule,
- Duration,
- Prices,
- Language/s of instruction,
- Files in different formats: text, Word, PPT, PDF, MP3, MP4, PDF, drawings, all types of files specific LMS supports, e-Book, subtitles for training videos, etc.
There exists a huge variety of formats, depending on the nature of the training.
- Tests and exams including mock tests and exams,
- Exam assessment model,
- Business cases,
- Examples,
- Exercises,
- Games,
- Related certificates and diplomas,
- Teacher/ Trainer manual,
- Methodology.
- Working environment
Some trainings require specific environment. For example, if the training is intended for software engineers, it may be necessary to have a software development environment. Or if the students are future mechanical engineers, it may be necessary to have some CAD system.

Student's Behavior Analyzer

Analyzing user behavior is a typical function of many systems, including those with artificial intelligence. The main goal is to offer the user personalized services adequate to her behavior. Examples of such personalized services are: Google Ads, Amazon's offerings, YouTube's content proposition.

The Student's Behavior Analyzer shall analyze the way in which the student uses the digital learning content. Typical events that the Student's Behavior Analyzer must analyze are:

What lessons does she learn? How much time does the student spend on lessons and solving assignments and tests? How does the student do on the tests? Does she study the lessons in the recommended order? How many times does he read the same lesson or solve the same problem?

Advisor, Competence configurator (AI)

Based on this information and the attributes of the lessons described above, the Digital Education Enterprise platform can provide the students with variety of advices and learning scenarios:

- It can propose other pieces of learning material to help student fulfill specific curricula,
- Based on some qualification's framework, e.g. EQF, and the set of competences the student has currently achieved, it can identify list of professions, that contain these competences, and can advise the student about possible learning paths,
- If the student moves faster with the training materials, the platform can provide him with advanced training stuff, and thus enabling the student to develop his full capacity,
- If the student does not do well in the tests, the platform can offer to repeat some material and to solve additional tests,



- If the student studies under specific curricula, e.g. some programming language, and if there are new versions of this language, the platform can advise the student to upgrade his/her competences,
- If the student has not work with the platform for a longer period, the platform can advise rehearsing of the study material.

The Competence configurator can advise the student which competences to choose in order to gain specific qualification.

You can see an example of Competence Configurator used by the School of Business Competences at Figure 28. It is under e-CF (the European e-Competence Framework 3.0 – A Common European framework for ICT Professionals in all industry sectors).

How does it work? There are 5 e-CF areas and 40 e-Competences depicted at Figure 28. There are 22 professions at the head row too. For any of these professions it is marked which e-Competences are necessary. For instance, according to e-CF, Business Analysts profession requires to gain at least the following subset of competences:

- A.1. IS and Business Strategy Alignment,
- A.3. Business Plan Development,
- A.4. Product/Service Planning,
- B.1. Application Development,
- B.5. Documentation Production,
- D.1. Need Identification,
- E.5. Process Improvement.

At the right side of Figure 28 you can see part of the training programs, provided by the School of Business Competence (these are more than 70). It is marked in the matrix which of the School of Business Competences training programs address Business Analysts profession, for instance, Figure 29:

- EBC*L A Business Economics curriculum addresses A.3. Business Plan Development and A.4 Product/Service Planning,
- EBC*L B Business Planning, Marketing and Sales addresses D1.1. Need Identification.

Hence, when a student is searching for a training for specific profession, the Competence Configurator will select the training provider programs (in this case – the School of Business Competences' set of training courses) which deliver the required set of competences.

Another approach used to configure the set of competences is depicted at Figure 30. The idea is to advise the student what kind of competences are necessary (must have) to be successful at specific corporate level and silo, and what kind of competences are “good to have”, but not mandatory. For instance, if an individual wants to be successful as a team leader in R&D silo (which usually is middle level manager's position), there are some “must have” competences. The team leader must have some soft skills in leadership and people management. R&D usually is organized as projects and programs, thus, project management skills under some best practice are necessary. From the other side the team leader needs to know something about the operations, (but not in details), where his team's product will be exploited. After that, logic similar to these at Figure 28, 29 and 30 can be applied, to provide the student with specific training agenda and courses.



Dimension 1 5 e-CF areas	Dimension 2 40 e-Competences	Business Analyst	Business Information Manager	Chief Information Officer (CIO)	Database Administrator	Developer	Digital Media Specialist	Enterprise Architect	ICT Consultant	ICT Operations Manager	ICT Security Manager	ICT Security Specialist	ICT Trainer	Network Specialist	Project Manager	Quality Assurance Manager	Service Desk Agent	Service Manager	Systems Administrator	Systems Analyst	Systems Architect	Technical Specialist	Test Specialist	EBCL A Business economics	EBCL B Business planning, marketing & leadership	EBCL C Management and leadership	Business economics for IT	PRINCE2 Foundation Certification
A. PLAN	A.1. IS and Business Strategy Alignment	2	3	4				8		1	1	1	1	1	1	1	1	1	1	2	2	2	2					
	A.2. Service Level Management																	18						X	X		X	
	A.3. Business Plan Development	2	3	4				8	9							15								X	X		X	X
	A.4. Product/Service Planning	2							9																X			
	A.5. Architecture Design							8												20	21							
	A.6. Application Design				5		7																				X	X
	A.7. Technology Trend Monitoring							8	9		11										21						X	
	A.8. Sustainable Development																								X			
	A.9. Innovating																											
B. BUILD	B.1. Application Development	2			5	6	7							14					19	20	21		23			X	X	
	B.2. Component Integration				5	6								14							21		23					
	B.3. Testing					6	7											19										X
	B.4. Solution Deployment						7							14									23					
	B.5. Documentation Production	2				6	7																				X	
	B.6. Systems Engineering																										X	
C. RUN	C.1. User Support											12					17		19									X
	C.2. Change Support										12											22						
	C.3. Service Delivery										12						17	18				22				X		
	C.4. Problem Management				5	6								14			17	18	19			22	24					
D. ENABLE	D.1. Information Security Strategy Development									11																		X
	D.2. ICT Quality Strategy Development															16												X
	D.3. Education and Training Provision												13													X		X
	D.4. Purchasing																								X		X	
	D.5. Sales Proposal Development																								X		X	
	D.6. Channel Management																								X		X	
	D.7. Sales Management																								X			
	D.8. Contract Management																	18										
	D.9. Personnel Development									10		12	13					18								X		
	D.10. Information and Knowledge Management		3		5						12																	
	D.11. Need Identification	2																							X			
	D.12. Digital Marketing																								X			
E. MANAGE	E.1. Forecast Development																								X			
	E.2. Projects and Portfolio Management		3	4											15										X			X
	E.3. Risk Management								9	10	11				15	16									X			
	E.4. Relationships Management			4											15													
	E.5. Process Improvement	2														16				20								
	E.6. ICT Quality Management									10						16												X
	E.7. Business Change Management		3					8	7	10					15											X		
	E.8. Information Security Management									10	11	12		14					19									
	E.9. IS Governance			4							11															X		

Figure 28 Sample Competence Configurator used by the School of Business Competences, Bulgaria



Dimension 1 5 e-CF areas	Dimension 2 40 e-Competences	Business Analyst	Business Information Manager	Chief Information Officer (CIO)	Database Administrator	Developer	Digital Media Specialist	Enterprise Architect	ICT Consultant	ICT Operations Manager	ICT Security Manager	ICT Security Specialist	ICT Trainer	Network Specialist	Project Manager	Quality Assurance Manager	Service Desk Agent	Service Manager	Systems Administrator	Systems Analyst	Systems Architect	Technical Specialist	Test Specialist	EBC*L A Business economics	EBC*L B Business planning, marketing & leadership	EBC*L C Management and leadership	Business economics for IT	PRINCE2 Foundation Certification
A. PLAN	A.1. IS and Business Strategy Alignment	2	3	4				8		1	1	1	1	1	1	1	1	1	1	2	2	2	2					
	A.3. Business Plan Development	2	3	4				8	9															X	X			
	A.4. Product/Service Planning	2							9						15									X	X		X	X
B. BUILD	B.1. Application Development	2			5	6	7							14					19	20	21		23			X	X	
	B.5. Documentation Production	2				6	7																					X
	D.11. Need Identification	2																								X		
	E.5. Process Improvement	2														16				20								

Figure 29 Configuration of competences of the School of Business Competences for Business Analyst profession

Investor				
CEO				
Middle level manager	Leadership Project management Service Design ...			
Professionals				
	R & D	Operations	Sales	

Figure 30 Competences Configurator focused on the skills, “must have” and “good to have” to be successful at specific corporate level



Business Process Automation Platform

This key asset of Student's business model is needed to provide individualized service delivery. It shall implement variety of scenarios, like these described in the previous section **Advisor, Competence configurator (AI)**.

For example, if the Configuration configurator proposes to the student set of training courses, the student confirms them, or part of them, the **Business Process Automation Platform** shall automatically generate a process which delivers these trainings. The **Business Process Automation Platform** could be simple, e.g. by assigning the chosen trainings to the student account in the LMS. The LMS will do the rest. It will send emails to student to inform her about next classes, will control the training schedule, will grant access to digital training resources, etc.

Key Activities

There are four key activities in the Students' business model.

Educational Service Management System Operation

Operating the Digital Education Enterprise is a critical activity. As far as the Digital Education Enterprise is a service organization, it is advisable to adopt a process approach and implement a suitable service management system. For this purpose, the ideas and processes of international standards such as ISO 9001 Quality Management Systems or ISO 20000-1 IT Service Management Systems can be used. There exist other service management best practices, but we believe that ISO 20000-1 ITSMS is very suitable.

We will discuss the educational service management processes in more details in Chapter 7.

Production of Digital Education Content

The Digital Education Enterprise can produce its own digital education content or use content produced by other parties. There exists variety of approaches and tools applicable for digital educational content production. It is important for any educational organization to set up educational content development environment and processes.

You can find such platform, tools, methodology, sample digital education content, and the like at <https://covid19digitalresponse.eu> – the website of Covid19 Digital Response project, 2020-1-BG01-KA226-VET-095108 „COVID-19 Digital Response”, Co-funded by Erasmus+ Programme of the European Union, Call 2020 Round 1 KA2 – Cooperation for innovation and the exchange of good practices, KA226 – Partnerships for Digital Education Readiness

Education, Certification, Validation of competences

Education and training are core activities, they are the reasons and educational organization exists. The Digital Education Enterprise can provide education and training services in variety of forms – digital, in-class, blended learning, self-service, etc. Therefore, relevant processes for any of that forms should be implemented.

Certification of competences can be done by the Digital Education Enterprise itself, or by some independent certification body. The certification, especially when conducted remotely, may require specific procedures to prevent fraud.

Some VET organizations can provide validation of competences service. It is necessary to implement validation process compliant to the specific legislation and regulations of the countries where VET organizations operate.



Key Partners

There are five key partners in the Students' business model.

Digital content vendors

The Digital Education Enterprise can use educational content produced by third parties. Some training services vendors play the role of an integrator – they do not produce their own courses, but maintain digital education platforms which allow third parties, individuals or companies, to sell courses via these platforms.

Accreditation and Certification bodies

Some educational and training curricula needs accreditation. Typical examples of accreditation bodies are Ministries of Education and Science, National Agencies for Vocational Education and Training. Accreditations can be provided by professional associations, e.g. for management system auditors, or by corporations for training on their products.

Digital Technology Vendors

In this category fall providers of technologies enabling the concept of the digital enterprise. Typical representatives of such technologies are Big Data, Internet of Things, Artificial Intelligence, Machine Learning, Business Intelligence, Natural Language Interfaces, Voice Synthesizers, Automatic Translation, Business Processes Modelling and Automation, Virtual Reality, and the like.

We should not forget the suppliers of classic technologies such as Learning Management Systems, websites, digital content production tools, software development and technical engineering tools.

An important role can be played by vendors who create specialized analysis tools, algorithms and mathematical models.

Industrial organizations

The industrial organizations role is to provide requirements to the competencies industries really need, internships, real life projects, themes for thesis and research, dual education opportunities.

Labour offices

The role of labour offices is to provide requirement to the competences labour market needs. They can be a channel to unemployed individuals and job seekers, which need training.

Channels

There are four channels Digital Education Enterprise will use to promote its services and to reach its customer segments.

Internet

Internet provides variety of opportunities for promotion, sell and delivery of educational services. Digital Education Enterprise shall have website and will use social networks and search engines as platforms for promotion, sell, gathering customers, training delivery, communications, cloud-based services, etc.

Schools, VETS, Colleges, HEIs

These organizations are the natural delivery channels for learning. Nowadays most of them use elements of Digital Education Enterprise's business model. But almost all of them need digital transformation plan to implement Students' business model.

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Local Authorities

Local authorities are often responsible for running municipal schools and other educational institutions. They provide the budgets of the municipal schools.

Channel partners

The channel partners play a role of distributors.

Customer Relationships

There are two core types of relationships between the Digital Education Enterprise and the customer segments.

Automated educational services

These can be delivered to the any point of the globe and shall be provided by some digital education platform.

Blended learning, self-service

The Digital Education Enterprise can provide education and training in variety of forms – from classical in-class training, through blended learning, to 100% self-service.

Revenue streams

The Digital Education Enterprise has many opportunities and models to generate revenue:

- Government subsidies,
- Training subsidized by other sources, awards, scholarships, grants,
- Paid – B2B, B2C, C2C, Revenue share,
- Subscription,
- Under project,
- Paid by an employer,
- Part of training for free, part – paid.

Cost structure

The Digital Education Enterprise is starting to look more and more like a software company. Significant part of its budget will be for hardware, software, IT-services and staff, IT-facilities and working environment, communications.

The core costs will be for R&D, Production of digital education content, operations and staff.



6.2 Corporate sector

A business model for the customer segment “Corporate sector” is presented in Figure 31. The “Corporate sector” business model has elements that are also present in the other business models. Therefore, we will not discuss them, but only describe the new elements that appear in the current business model.

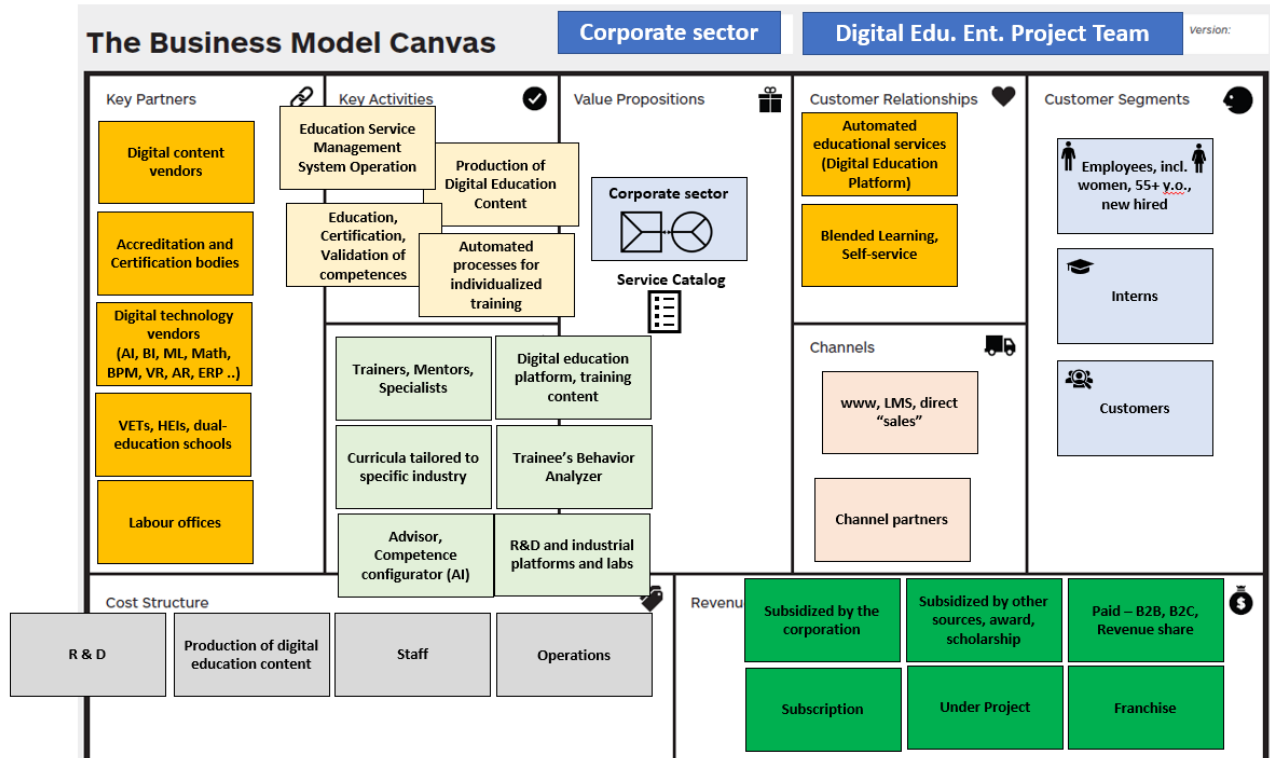


Figure 31 A business model for the customer segment “Corporate sector”

Customer segment

The “Corporate sector” business model produces and delivers value to three customer segments:

- Employees, including women, 55+ years old employees and new hired,
- Interns, dual-education students,
- Customers.

These customer segments’ profiles and value maps are depicted in Figures 21, 20, 22 (in fact, interns’ profile is a profile of a student).

Value propositions

The value propositions to the “Corporate sector” customer segments are depicted in Figures 21, 20, 22.

Service catalogue

The Service catalogue is an element of all value propositions in this document. We presented the Service catalogue concept in detail in Chapter 6.1.

Note that an organization can have many service catalogues. E.g. for

- on-boarding training,



- on specific company's business area or technology,
- for its product lines,
- for specific client.

Key assets

The key assets, specific for this business model are explained below.

Trainers, Mentors, HR, Specialists

These can be company's employees. They play important roles in the planning and delivery of training. Some of them are involved in both production and training. It is important that they go through training-trainers programs and specifically on training methodologies. The last can be an element of the digital transition plan.

Curricula tailored to specific industry

Each industry needs specific competencies, which very often are not presented in the standard curricula. Such curricula shall be designed for training company's employees and interns. In this group fall curricula, focused on company's products and training customers.

Customers training curricula and content can be very important assets, and can generate significant revenue.

R&D and industrial platforms and labs

These kinds of assets are necessary to train engineers, students and interns on company's specific technologies, development platforms, tools and equipment. Very often the education institutions have no such equipment, software and tools. Therefore, the last are important to fill the gap between VETs and HEIs and the industry.

Key activities

In fact, this business model key activities are the same as for the Students' business model. Of course, there are specifics. For instance, certification can be mandatory for some occupations. Validation of competences can be important tool in reskilling/upskilling employees. It is important instrument to motivate employees achieve professional qualification at their workplace.

Key partners

In times of skilled labor shortage, the VETs, HEIs and other educational and training institutions become very important partners of the industry. The enterprises have variety of opportunities to benefit from such partnership:

- Inclusion in the curricula of subjects developing competencies and skills that the enterprise needs,
- Playing role of "producer" of industry specific programs. This approach prepares future employees and future clients,
- Outsourcing trainings,
- Outsourcing some of the onboarding trainings. The aim is students to pass part of the onboarding during regular education process, thus cutting onboarding cost.



Channels

An enterprise has direct access to its employees, interns and clients.

Channel partners

Such kind of channel partners:

- Labour offices, that can promote jobs and relevant training to the jobseekers,
- VETs, HEIs,
- Company's business partners, that sell company products and train customers how to operate these products. Some channel partners can be fully focused on training end customers.

Revenue streams

We have identified here two new revenue sources:

- Franchise,
- Training under specific customer's requirements.

Cost structure

The company may have specific expenses to provide R&D and industrial platforms and laboratories.

6.3 Individuals seeking training on their own

A business model for the customer segment "Individuals, seeking training on their own" is presented in Figure 32. Again, we will not discuss elements presented in the other business models

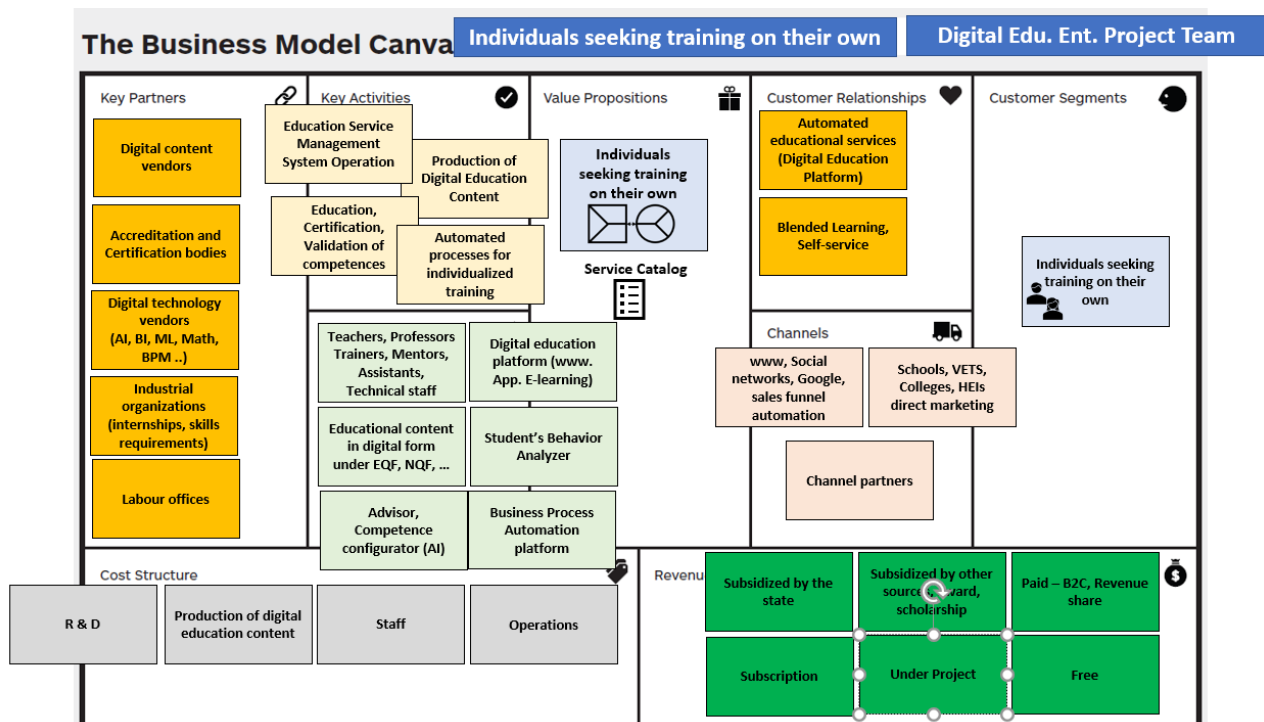


Figure 32 A business model for the customer segment "Individuals seeking training on their own"



Customer segment

The “Individuals seeking training on their own” customer segment’s profile and value map are depicted in Figure 17.

Value propositions

The value proposition to the “Individuals seeking training on their own” customer segment is depicted in Figures 17 and commented in Chapter 5.3.

Service Catalogue

The Service catalogue is an element of all value propositions in this document. We presented the Service catalogue concept in detail in Chapter 6.1.

Key Assets

The key assets of this business model are the same as for the “Students” business model.

But there are specifics. The elements “Student’s Behavior Analyzer” and “Advisor and Competence configurator” will play crucial role.

In the worst-case scenario such individuals do not have a clear idea of their goals. Therefore, it is important to understand the current level of competence of the individual, to help him choose potential target qualifications, to configure the corresponded set of competences, and to propose him variants of training.

Let's look at an example scenario. We shall use the competence configurator shown in Figure 28. Let's suppose an individual wants to develop IT career:

(1) If she wants to achieve specific qualification, e.g. Digital Media Specialist, it is easy. The core competences according to q-CF are listed in Digital Media Specialist column. Next, the Competences configurator shall search for training courses at the right site of the matrix, where the training provider portfolio is presented.

(2) If she is not quite sure what qualifications are appropriate, she can be asked to fill simple questionnaire that asks her which of the competences, listed in Dimension 2 column, she has achieved.

Let us imagine she checked:

A.1. IS and Business Strategy Alignment

A.3. Business Plan Development

A.4. Product/Service Planning

E.5. Process improvement

Then she has:

- 4 of 7 competences for Business Analyst qualification (57%),
- 2 of 5 competences for Business Information Manager qualification (40%),
- 2 of 5 competences for Chief Information Officer qualification (40%),
- 2 of 5 competences for Enterprise Architect qualification (40%).
- 2 of 4 competences for Quality Assurance Manager qualification (50%).



It can be seen that the individual's current qualification is closest to the Business analyst, then to Quality Assurance Manager, etc.

Therefore, the Advisor can offer the individual five qualification options, ranked according to what percentage of the competencies for the corresponded profession she currently possesses. The first one represents the shortest way to achieve qualification.

After that the Competence Configurator can generate curricula based on the educational organization's portfolio of courses.

The logic of the rest of this business model's elements is the same as for the "Students" and "Corporate sector" business models.

6.4 Specific groups

A business model for the customer segment "Specific groups" is presented in Figure 33. Again, we will not discuss elements presented in the other business models

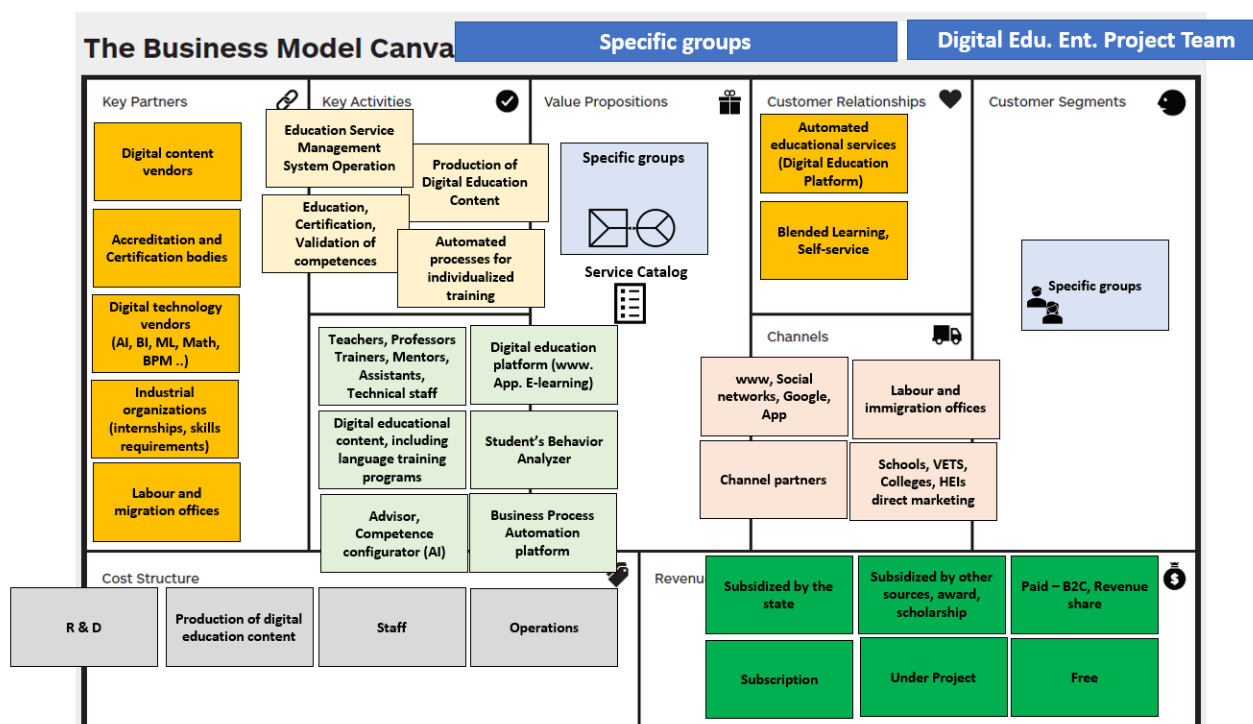


Figure 33 A business model for the customer segment "Specific groups"

In general, the elements of this business model are similar to "Individuals seeking training on their own".

Customer segment

The "Specific groups" customer segment's profile and value map are depicted in Figure 18.

Value propositions

The value propositions to the "Specific groups" customer segment is depicted in Figure 18 and commented in Chapter 5.4.



Service Catalogue

The Service catalogue is an element of all value propositions in this document. We presented the Service catalogue concept in detail in Chapter 6.1. Due to the demographics of the “Specific groups” segment, the Service catalog will likely need to contain specific programs and services as language learning, upskilling and reskilling, more flexible learning schemes, competence validation services.

Key Assets

The key assets of this business model are the same as for the “Students” and “Individuals seeking training on their own” business models.

But there are specifics.

(1) The elements “Advisor and Competence configurator” and “Student’s Behavior Analyzer” will play crucial role, because:

- Some representatives of this customer segment will need to catch up with the missed material,
- Reskilling/upskilling programs will prevail,
- Because of the skilled labour shortage in many industries, programs that deliver competencies in the area of these scarce professions will be of great interest,
- Language training will be mandatory element of any proposition to migrants.

(2) Multilanguage interface will be necessary,

(3) Natural language interface, voice synthesizer and automatic translation will be necessary.

Key activities

For some students, like migrants, certification and validation of competences activities will be important, because will help them find jobs.

Key partners

A new key partner, “Migration offices”, appears in this business model.

Channels

In addition to the channels, presented in the other business models, labour and immigration offices will play important role.

Schools and VETs are important channel for this business model, because students, that do not regularly visit classes or that have left school are in the target customer segment.

Customer Relationships

There are no specific differences in this business model compared to the other three.

Revenue Flows

There are no specific differences in this business model compared to the other three.

Cost Structure

There are no specific differences in this business model compared to the other three.



Chapter 7: Design of processes that implement Digital Education Enterprise business model

ISO 9000 defines “business process” as “Set of interrelated or interacting *activities* which transforms inputs into outputs”, Figure 34.



Figure 33 Process

A business process can comprise mix of automated or manual activities, Figure 35. When designing a process, it is important to understand the whole set of activities within the process and their business rules. The process designer must understand the whole picture, in order to understand how the process should work. Websites, systems, applications, any equipment, usually automate part of the whole process.

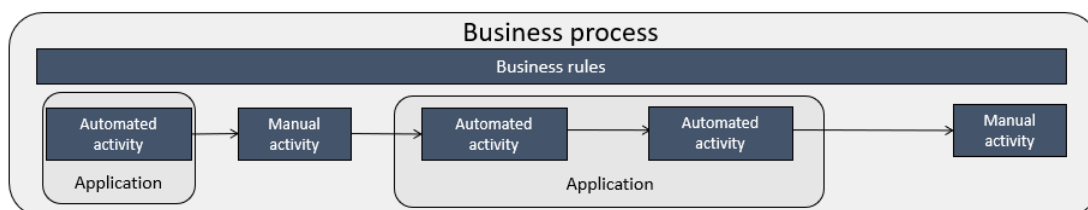


Figure 35 Understanding a business process

The key characteristics of a process are:

- To be definable – to have goal, input, output, clear bounds, beginning and end,
- To be ordered – to comprise actions ordered in time in space,
- To have a client – to have a recipient at the output,
- To add value – to add value along the supply chain,
- “Built in”- a process always exists in an organization’s framework,
- Cross-functional – a process may engage individuals and units from different divisions.

There are six questions the process designer must ask in order to understand a process:

- **Why?** – What are the reasons for the existence of this process? What are its objectives? Why is it done this way? What are the limitations?
- **Who/What?** – Who are the individuals and/or what are the objects which play roles in the process? Who does the job? Who should do the job? Who knows how to do the job? Who should know how to do the job?



- **How much?** - The quantitative parameters of the process. How many instances of the process?
- **Where?** - Where does the process take place? Where should it be performed? Where are the individual tasks performed in the process? Where the process can be performed?
- **When?** - When is the process performed? When should it be performed? When the process can be performed?
- **How?** - Process algorithm. Sequence of actions. Is the process automated?

A lean way to implement Digital Education Enterprise business model

There are probably hundreds of ways to implement Digital Education Enterprise's business model.

A lean way to implement Digital Education Enterprise's business model is depicted in Figure 36.

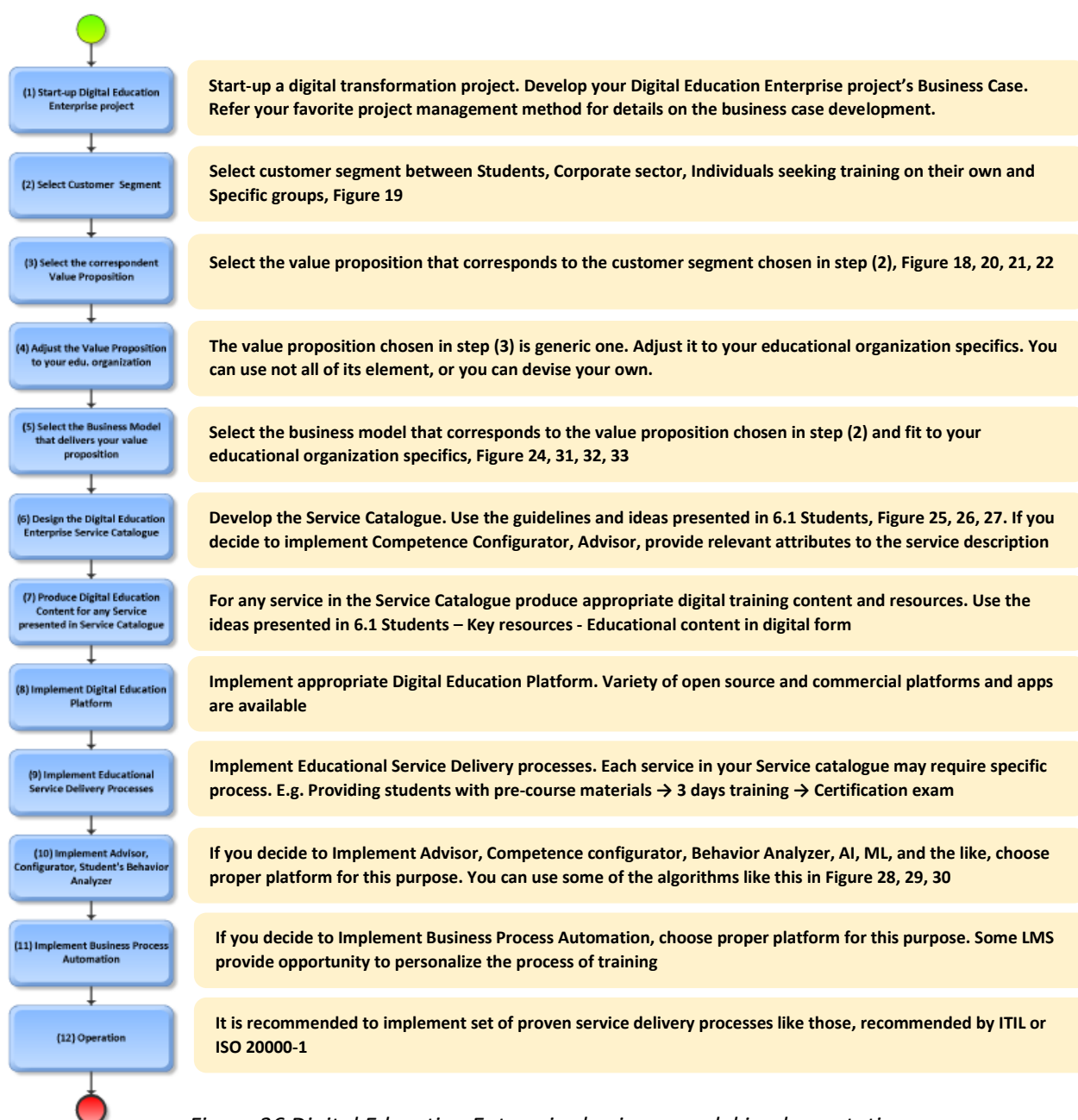


Figure 36 Digital Education Enterprise business model implementation process



Business Processes that realize Digital Education Enterprise's key activities

Of the four business models described in Figures 24, 31, 32 and 33 one can see that the key activities are the same for all of these business models:

- Production of Digital Education Content,
- Education, Certification, Validation of competences,
- Automated processes for individualized training,
- Education Service Management System Operation.

Process for Production of Digital Education Content

There are probably hundreds of ways to produce Digital Education Content. We shall use the abbreviation "D.E.C." for "Digital Education Content". A process for D.E.C. production is depicted in Figure 37.

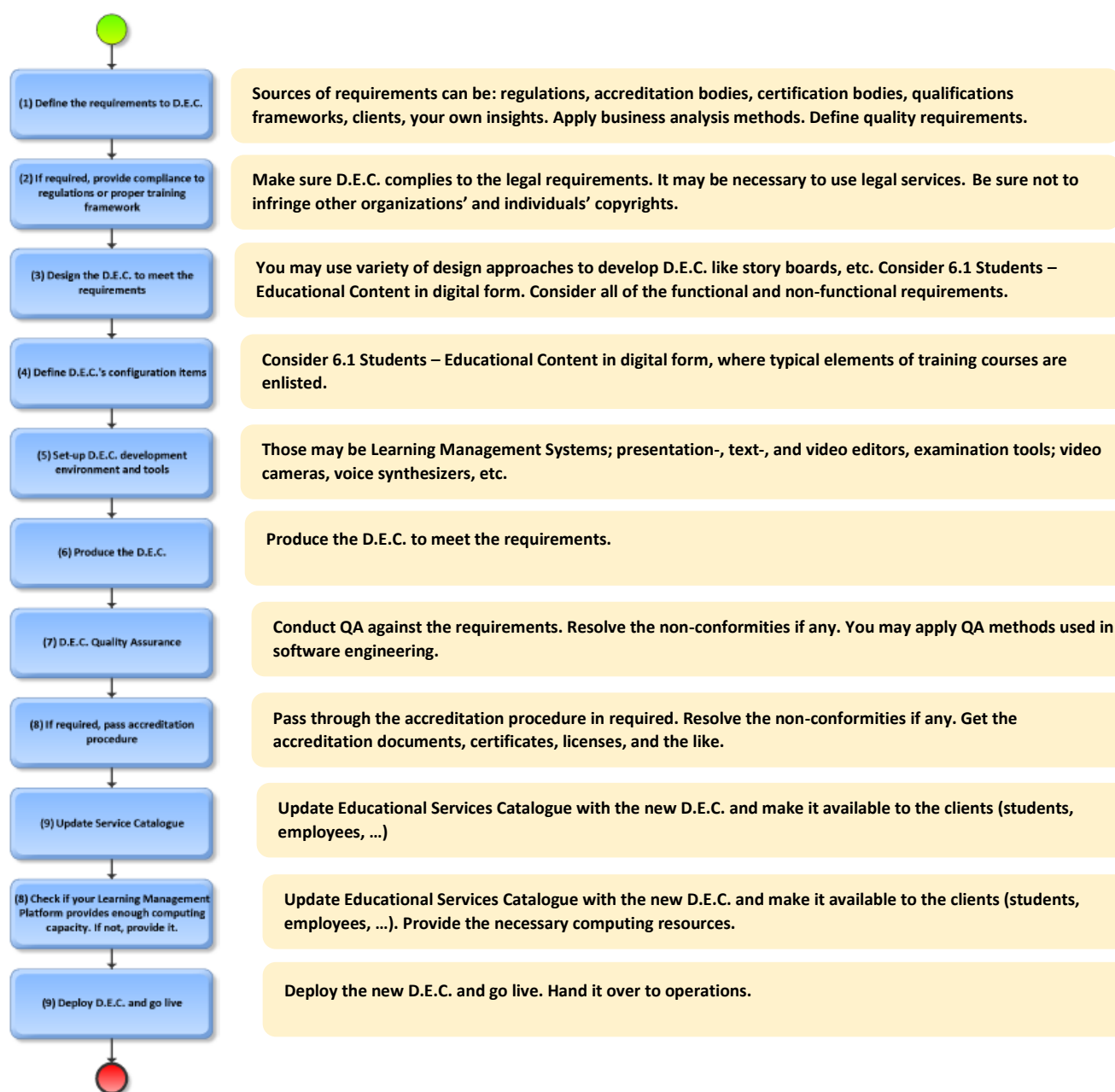


Figure 37 A process for Digital Education Content production



Process for Education, Certification, and Validation of competences

For each educational/training product, listed in the Service Catalog, there needs to be a process for providing that learning service. It is practically impossible to create an universal process for the provision of any kind of training services. Therefore, the Digital Education Enterprise must design the processes needed to provide its specific services.

Below are examples of processes for implementing several learning scenarios.

Scenario 1 Student goes through a learning module and resolves a test

It is a simple scenario; the process is depicted in Figure 38. A training module is uploaded into the Learning Management System. A student requests access to a learning module. Digital Education Enterprise registers the student into its LMS and grants her with access to the digital learning content for period of time. The student goes through the learning module, resolves a final test, and the process ends.

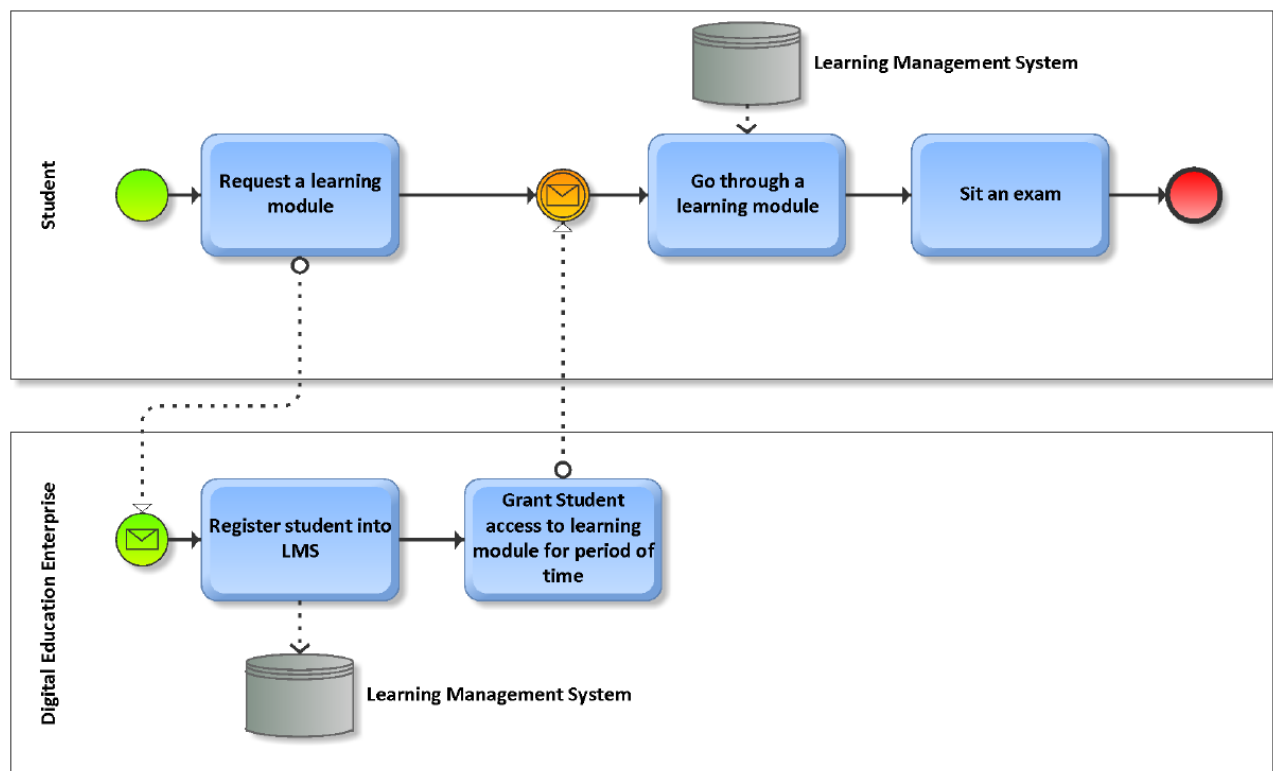


Figure 38 Very simple education scenario

Scenario 2 School student goes through a learning program on specific subject

Scenario 2 is very typical for schools; the process is depicted in Figure 39. There is a sequence of learning modules, exercises, tests and final exam. The teacher sets-up into the LMS that sequence, the LMS warns the student by emails about the next class, and the student must go through the next task. Almost any LMS allows the teacher to define such kind of learning processes.

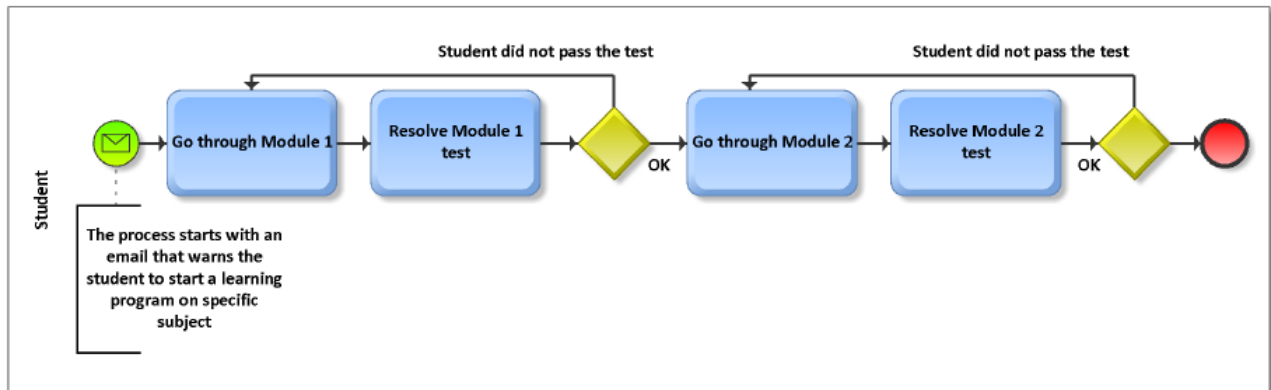


Figure 39 School student goes through a learning program on specific subject

Scenario 3 Certification training

The process depicted in Figure 40 is typical for certification training. Usually there are three roles engaged in such kind of process: Student, who wants to achieve certification on some subject, e.g. project management; an Accredited Training Organization (ATM), and an independent Certification Body. In this case the Digital Education Enterprise plays a role of an ATM.

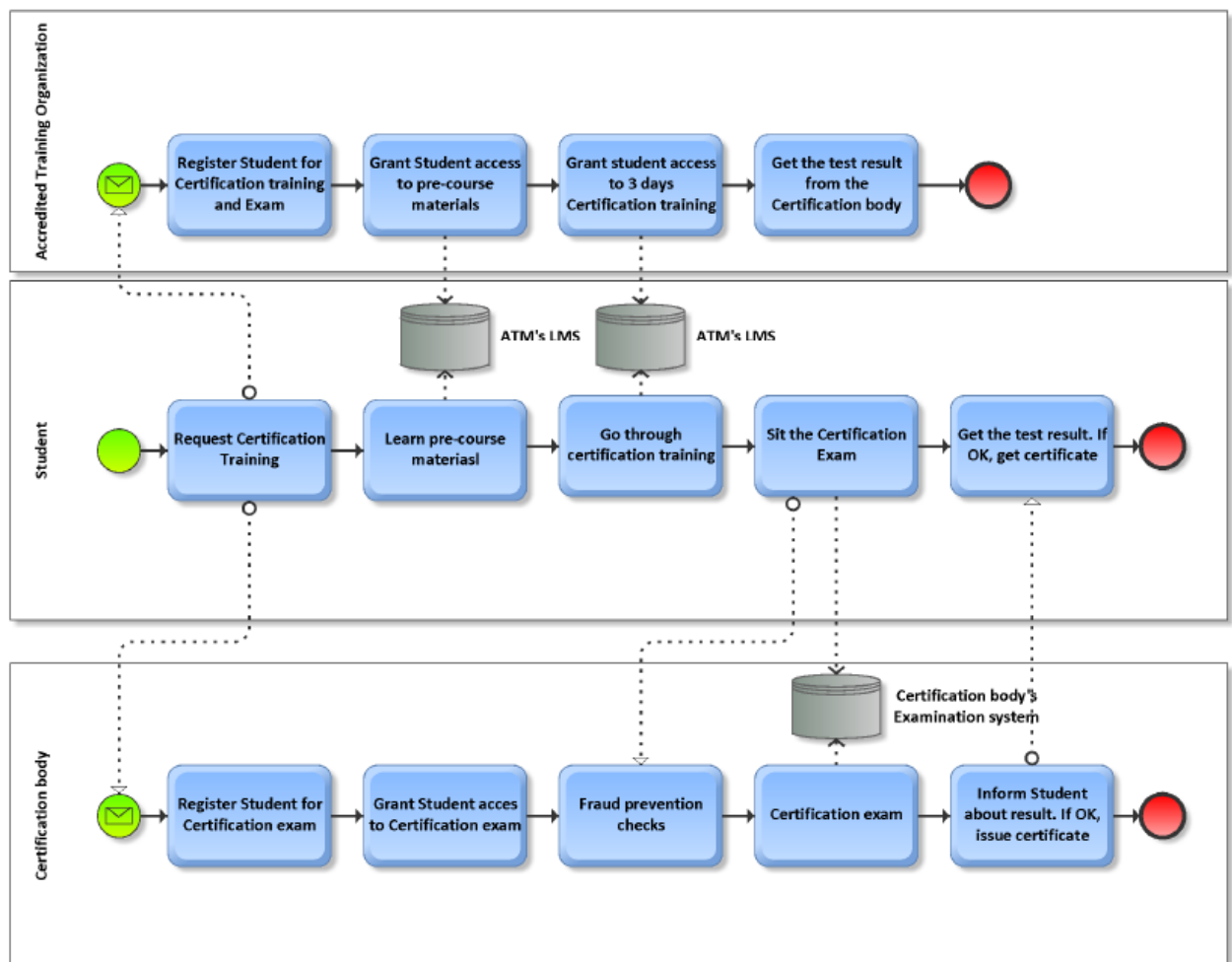


Figure 40 Certification training and examination process



Process for validation of competences

Note, the process for validation of competences can depend on the National legislation. The example below consists of two processes:

- The process depicted in Figure 41 is intended to achieve and maintain accreditation as Competences Validation Body.
- The process depicted in Figure 42 is intended to validate competences of individuals and support them in achieving qualification.

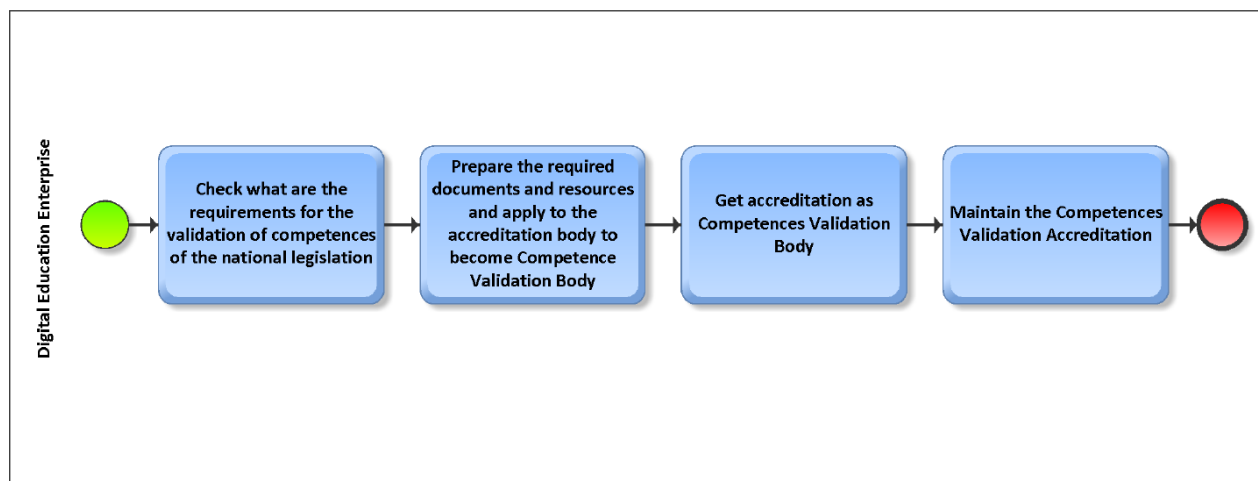


Figure 41 Process of accreditation to become Competences Validation Body

Due to accreditation, the applicant organization, in this case the Digital Education Enterprise, must prepare the required set of documents. Examples of such documents are: Application form, Validation procedures, Code of conduct, Quality Assurance procedure, Competences Validation Commission rules, Logs, Criteria to approve competences, qualification frameworks against which the validation will be conducted, and the like.

Usually the applicant must demonstrate it has human resources competent to conduct validation activities.

The process in Figure 42 is more complex. The process begins with the applicant submitting a set of documents proving the current set of competencies she possesses. It is likely that the verification of these documents will also involve manual operations, interviews, exchange of documents.

The next step is to validate competences acquired in non-formal learning. This is likely to include interviews with the applicant and her managers and employers, as well as tests to confirm these competencies. Those tests shall be conducted and assessed by the Digital Education Enterprise's platform. Ultimately, the Competency Configurator will determine which qualifications are appropriate for the candidate and which one she can achieve the fastest. Based on that the Competency Configurator will generate individual training program and will grant candidate access to the correspondent educational resources. The Digital Education Enterprise's platform will run this individual program, the candidate will go through the training process. At the end of the day the candidate will sit a qualification exam, and if the results are positive, will gain diploma on the target qualification.

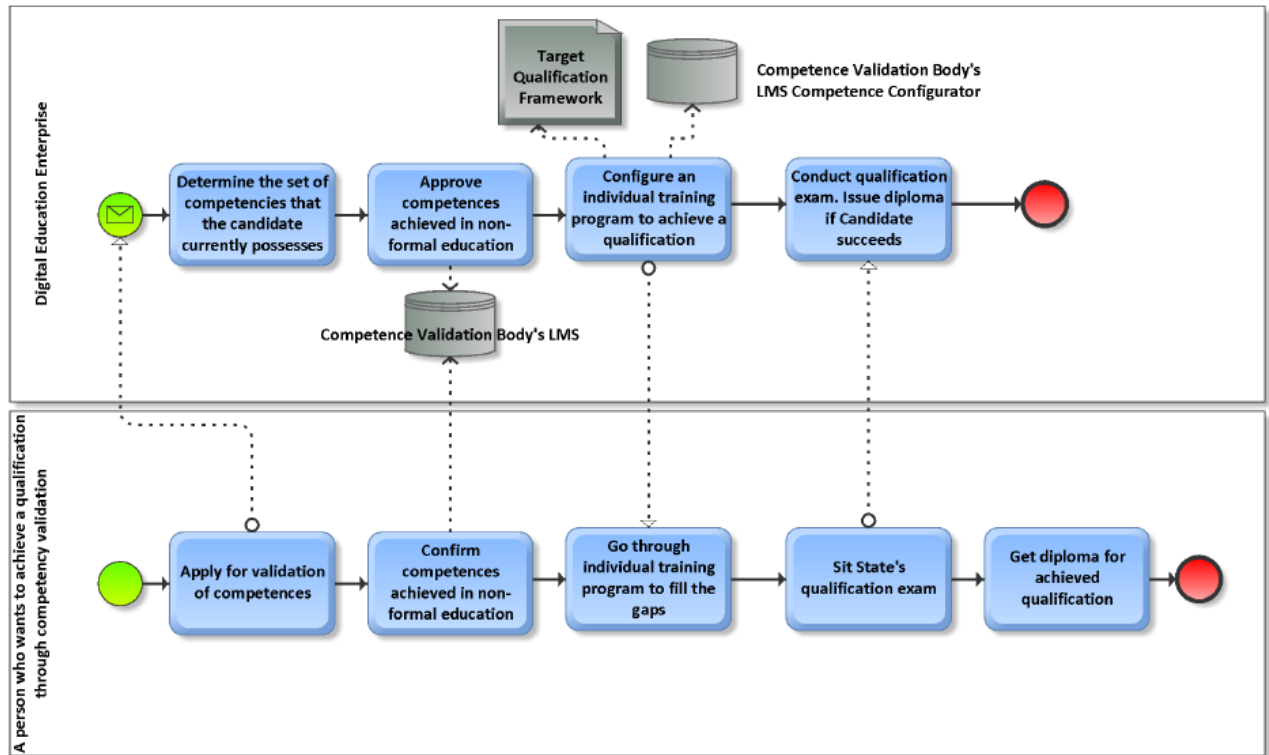


Figure 42 Process for Validation of competences

Automated processes for individualized training

In topic 6.1 we have explained two algorithms which configure and propose training program that fits to the student's unique needs of competences. This individual program will consist of elements of the Service Catalog.

Therefore, the task of generating a process to implement the individual training program can be reduced to setting up the Digital Education Enterprise's platform to deliver the selected items of the Service Catalogue. This task is relatively easy, because each element of the Service Catalogue is associated with an education delivery process. The selected configuration items must be assigned to the student, and the Learning Management System will do the rest.

Education Service Management System Operation

So far we have seen what the specific processes are that implement the key activities of the four business models.

The question arose as to whether this is a sufficiently complete set of processes to enable the smooth delivery of [training] services? The answer to this question is negative. The educational and training organizations can tackle this challenge by implementation of set of processes provided by appropriate service management best practice or some ISO's management system like ISO 9001 – Quality Management Systems or ISO/IEC 20000-1:2018 IT—Part 1: Service management system requirements (8). We suggest that training organizations consider the processes outlined in Figure 43, and the process approach, Figure 44. The rationale in favor of such a solution are that digital enterprises acquire features of a software organization. Therefore, good IT-organization management practices are appropriate.



The implementation of processes that meet the requirements of ISO 20000-1 does not mean that the Digital Education Enterprise must certify an IT Service management system (SMS).

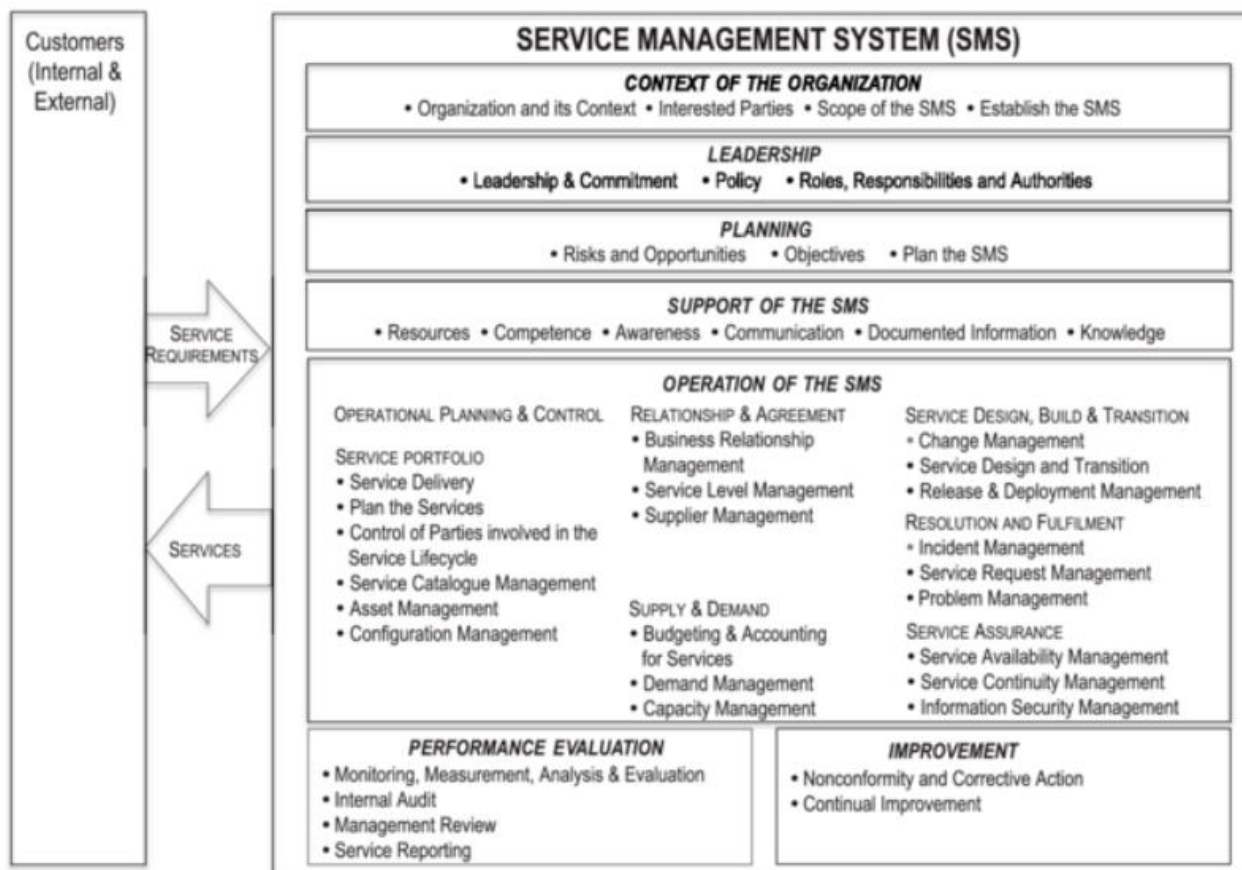


Figure 43 ISO 20000-1 Service Management System's processes, Source ISO 20000-1

It is likely that many training organizations have implemented ISO 9001 Quality Management System. ISO 20000-1 follows the same philosophy as ISO 9001, but provides specific service management processes. We must emphasize that the processes indicated in Figure 43 are recognized by many industries as necessary for the delivery of quality services.

The Digital Education Enterprise's user segments, value propositions to these segments, business models that produce and deliver them, the processes that carry out their key activities, together with the processes recommended by ISO 20000-1 are a good basis for digital transformation of any educational/training organization.

The last can be used to plan in details the reengineering of an educational/training organization into Digital Education Enterprise, Figure 45.

The matrix depicted in Figure 45 identifies the educational services processes that fulfill the Digital Education Enterprise core business processes to a full set of managed services delivery processes.

The goal of this matrix is to help an educational/training organization in developing their specific digital transition plan to become Digital Education Enterprise.

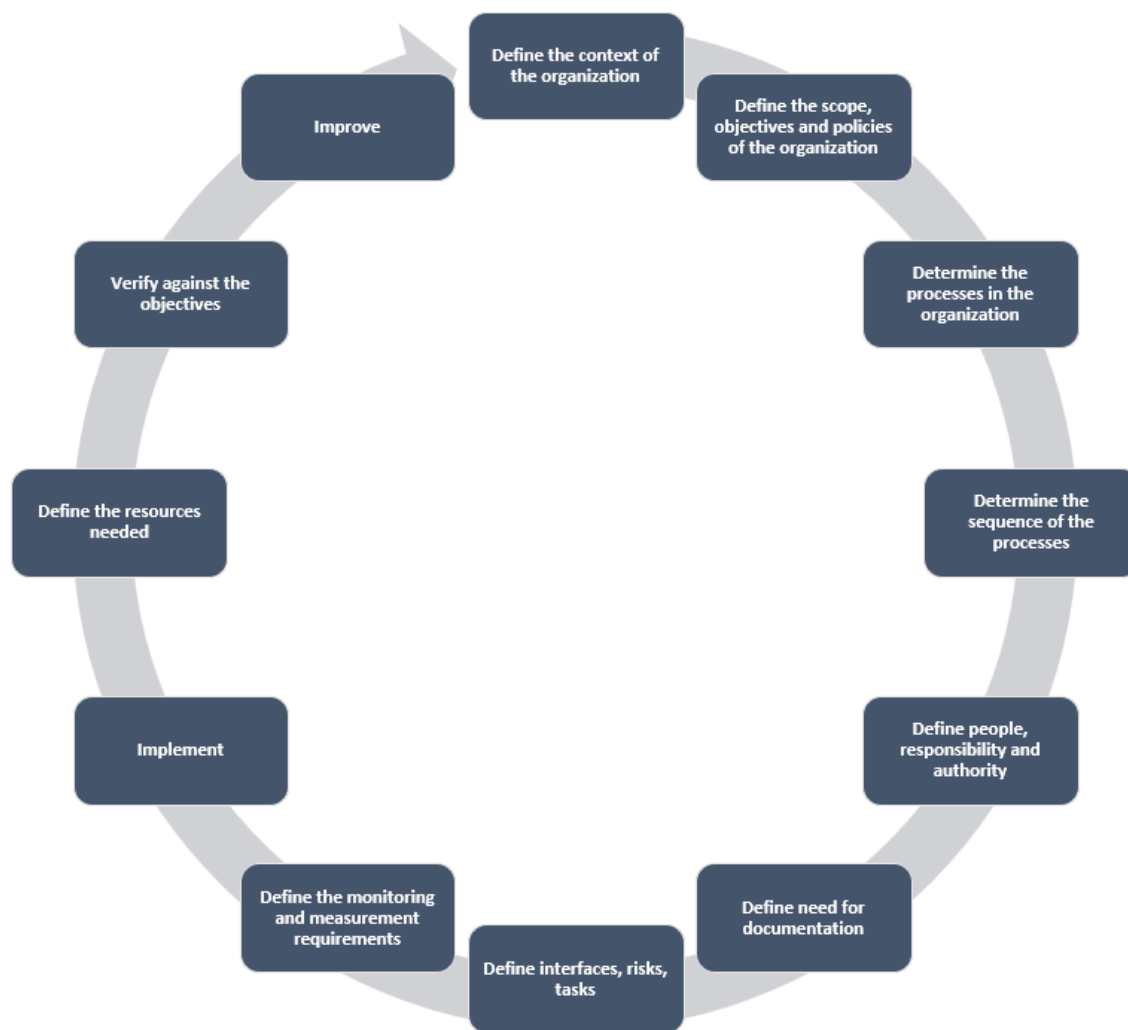


Figure 44 The Process approach, Source ISO



Service management system element according to ISO 20000-1	Elements of the Digital Education Enterprise developed in O1 – Digital Education Enterprise – business model and processes	Comments
Customers (Internal & External)	The Customer segments are defined in Chapter 4: Education/training customer segments, types and forms of training	An educational/training organization may use some customer segment defined in Chapter 4 and specify in more details its customer's characteristics
Service Requirements	Service requirements that reflect the Digital Education Enterprise perspective and customer segments' expectations are defined in Chapter 5: Value propositions, and Chapter 6: Business models.	An educational/training organization should specify in details its services in terms of educational framework, specific training methods, curricula, client's requirements, and the like.
Services	The services are described in the Digital Education Enterprise's Service catalog. The main activities of their delivery are described in the correspondent business model, Chapter 6: Business models	The Digital Education Enterprise's services may be mix of services in digital and other forms.
Organization and its context	In fact, the Digital Education Enterprise context is represented to a high degree by its business model	An educational/training organization should use the correspondent generic business model, Chapter 6, and justify it to its specific environment.
Interested parties	In fact, the interested parties are elements of the business model – Customer segments, Key partners	An educational/training organization should identify its specific interested parties.
Scope of the SMS	The scope of the SMS is presented in high degree by the Digital Education Enterprise business model and Service Catalogue	This project is focused on the Digital Education Enterprise concept, characteristics and key technologies. An educational/training organization should define the scope of its SMS in terms of set of services, territory, divisions, and the like.
Establish the SMS	In fact, the establishment of the Digital Education Enterprise's SMS is described in Chapter 7, "A lean way to implement Digital Education Enterprise business model"	In the real world, an educational/training organization must make and document a series of management decisions
Leadership & Commitment	This aspect of SMS is partially reflected in the project for the implementation of the Digital Education Enterprise business model.	In the real world the top management must make and document series of management decisions, provide resources, and demonstrate long-term leadership and commitment.
Policy	This aspect of SMS is partially reflected in the project for the implementation of the Digital Education Enterprise business model.	The top management must redefine the Digital Education Enterprise service management policy

Figure 45 Elements of the plan to transform an educational/training organization into a Digital Education Enterprise



Service management system element according to ISO 20000-1	Elements of the Digital Education Enterprise developed in O1 – Digital Education Enterprise – business model and processes	Comments
Roles, Responsibilities and Authorities	This aspect of SMS is reflected in part. Processes which implement the business models' key activities are designed, but the roles are not defined.	The beauty of the process approach is that the processes we have designed are independent of the specific enterprise. It is the task of the management of a particular educational/training organization to define the roles, responsibilities and authorities of its employees who play roles in these processes.
Risk and Opportunities	This aspect of SMS is not typical element of a business model and is not reflected in the Digital Education Enterprise business model.	The top management must identify and manage the risks. Because of the fact digital assets may be subject of cyber-attacks, it is highly recommended to implement proper risk management method. ISO 31000 provides directions for this purpose.
Support of the SMS	The Digital Education Enterprise's business model must be supported.	Sustaining the business model includes provision of the necessary resources – technical, human, financial, knowledge (which is an important key asset). It is necessary to provide the Digital Education Enterprise with training to achieve and maintain the required competences. To aware the staff and clients about the digital transition. To establish communication channels to the interested parties. A proper set of documentation should be developed and maintained.
Operational planning and control	The Business model is a conceptual tool, which demonstrates how an enterprise produces and delivers value. The Digital Education Enterprise's business model by default comprises activities from this section of ISO 20000-1.	Some of the processes in this section of ISO 20000-1 need to be detailed
- Service delivery	Key processes of service delivery are presented in Chapter 7	In the real world any educational service can have specific service delivery process. We marked it as mandatory educational service's configuration item. An educational/training organization must design its specific services delivery processes when implementing the Digital Education Enterprise's business model.
- Plan the Services	Key elements to consider when planning the educational services are presented in Chapter 5, 6, and 7.	Plan the service process contains activities along the educational service lifecycle chosen by your organization. The Digital Education Enterprise shall set educational service management goals and to plan how to achieve these goals.

Figure 45 Elements of the plan to transform an educational/training organization into a Digital Education Enterprise – continuation



Service management system element according to ISO 20000-1	Elements of the Digital Education Enterprise developed in O1 – Digital Education Enterprise – business model and processes	Comments
- Control of Parties involved in Service Lifecycle	The key parties are presented in the business model (Key Partners, Customer segments, organizations that play roles in some of the Digital Education Enterprise's business model (e.g. channel partners)	The Digital Education Enterprise shall sign specific agreements with parties involved in service lifecycle. The aim is to provide that these parties will guarantee the educational services will meet the requirements, the service levels, business continuity, and the like
- Service Catalogue Management	The key Educational Service Catalogue management activities are defined in the Digital Education Enterprise's business model, Chapter 6 and 7	Organizations that implement Digital Education Enterprise's business model must specify in details their Service catalog.
- Asset Management	The key assets of the Digital Education Enterprise's business model are identified in Chapter 6.	Organizations that implement Digital Education Enterprise's business model shall manage their key assets, e.g. www. App, and the like.
- Configuration Management	The typical configuration items of an educational service are identified in Chapter 6	Organizations that implement Digital Education Enterprise's business model shall make some political decisions due to the educational services configurations structure. The impact of any change shall be assessed and controlled.
Operation of the SMS	The key activities to operate the Digital Education Enterprise's business model are identified in Chapter 6.	In fact, any block of the business model can contain activities related to the operation of SMS. E.g. Revenue Flows block could have invoicing-, controlling-, card-payments-, etc. activities. Organizations that implement Digital Education Enterprise's business model shall specify in details such operation activities.
- Business Relationship Management	The Digital Education Enterprise's business model has identified the key players	The Digital Education Enterprise has to identify and document the clients, users and other parties interested in its educational services. The enterprise shall assign employees responsible to manage the relationships with clients. At planned periods the enterprise shall measure clients' satisfaction. Clients' complaints shall be recorded and managed until closed.
- Service Level Management	The Digital Education Enterprise's business model requires SLA to be associated with any of its educational services.	Organizations that implement Digital Education Enterprise's business model shall plan means to provide the promised educational services levels.
- Supplier Management	The Digital Education Enterprise's business model has identified the key categories of suppliers	Organizations that implement Digital Education Enterprise's business model shall have procedures to manage suppliers

Figure 45 Elements of the plan to transform an educational/training organization into a Digital Education Enterprise – continuation



Service management system element according to ISO 20000-1	Elements of the Digital Education Enterprise developed in O1 – Digital Education Enterprise – business model and processes	Comments
Budgeting, Accounting and Billing for services	These elements of a SMS are part of the Digital Education Enterprise's business model Revenue flows and Cost structure blocks.	It is important to know what is the cost to produce and provide an educational service. Thus, organizations that implement Digital Education Enterprise's business model shall implement budgeting for services process. This process shall identify and assess all costs related to specific service. The budget items shall be dully categorized – costs for hardware, software, personnel, licenses, purchasing of services, facilities, CAPEX, OPEX, fixed and variable costs. Cost models shall be devised. Billing schemes for educational services shall be designed.
Demand Management	This aspect of a SMS is not presented as a key activity in the Digital Education Enterprise's business model.	Organizations that implement Digital Education Enterprise's business model shall tackle the demand management task. They shall analyze and forecast future demand for educational services and, if necessary, they shall provide proper capacity to meet the demand.
Capacity Management	This aspect of a SMS is not presented as a key activity in the Digital Education Enterprise's business model.	Organizations that implement Digital Education Enterprise's business model shall monitor the capacity consumption and, if necessary, to provide additional capacity. In case of implementation of new or changed educational service, the necessary capacity must be assessed and provided.
Service Design, Build & Transition	The methodology described in Chapter 3 provides a very good and universal process for service design. Chapter 4, 5 and 6 demonstrate how this methodology works in practice.	Organizations that implement Digital Education Enterprise's business model shall implement appropriate service design method. It is recommended to have separate Service development-, Service testing-, and Production- environments.
Change Management	The change management process is not considered by the Digital Education Enterprise's business model, because almost any organization has its own.	Organizations that implement Digital Education Enterprise's business model shall use their current change management process or devise a new one. It is a standard task.
Release and Deployment Management	This aspect of a SMS is not presented as a key activity in the Digital Education Enterprise's business model.	Organizations that implement Digital Education Enterprise's business model shall have release and deployment policies and a risk-free service deployment procedure.
Resolution and Fulfilment.	This aspect of a SMS is not presented as a key activity in the Digital Education Enterprise's business model.	Organizations that implement Digital Education Enterprise's business model shall implement Incident- and Problem- management procedures, which register any incident/problem and manage their resolution until closed.

Figure 45 Elements of the plan to transform an educational/training organization into a Digital Education Enterprise – continuation



Service management system element according to ISO 20000-1	Elements of the Digital Education Enterprise developed in O1 – Digital Education Enterprise – business model and processes	Comments
Service Assurance	This aspect of a SMS is not presented as a key activity in the Digital Education Enterprise's business model.	Service assurance comprises Service Availability-, Service Continuity- and Information Security- management. In fact, these are elements of information security management. You can find business continuity process especially designed for educational organizations at https://covid19digitalresponse.eu – the website of Covid19 Digital Response project, 2020-1-BG01-KA226-VET-095108 „COVID-19 Digital Response”, Co-funded by Erasmus+ Programme of the European Union, Call 2020 Round 1 KA2 – Cooperation for innovation and the exchange of good practices, KA226 – Partnerships for Digital Education Readiness You can find suitable processes and information security means in ISO 27000 family of standards and code of best practice
Performance evaluation	This aspect of a SMS is not presented as a key activity in the Digital Education Enterprise's business model.	Performance evaluation comprises Monitoring, measurement, analysis & evaluation; Internal audit, Management review; and Service reporting. Organizations that implement Digital Education Enterprise's business model shall implement suitable KPIs, monitor, measure, analyze and evaluate Digital Education Enterprise's performance. Usually any LMS provides such kind of tools. Educational service reporting is very important. It is a good practice to assign appropriate reports with any educational service. Service reporting may demonstrate the student's progress, performance, level of competences achieved till specific point, and propose to the student other educational services. The Internal audit and Management review are tools for self-assessment of the SMS performance.
Improvement	This aspect of a SMS is not presented as a key activity in the Digital Education Enterprise's business model.	Of course, the Digital Education Enterprise must resolve any non-conformity, searching for the root cause of that non-conformity, and taking corrective actions. Continual SMS improvement is mandatory activity.

Figure 45 Elements of the plan to transform an educational/training organization into a Digital Education Enterprise – continuation



Chapter 8: Behavior design

The purpose of this chapter is to demonstrate how a behavior design technology, proposed by N. Eyal in (7), can be applied to the development of learning habits forming digital education products.

A habit is a routine of behavior that is repeated regularly and tends to occur subconsciously.

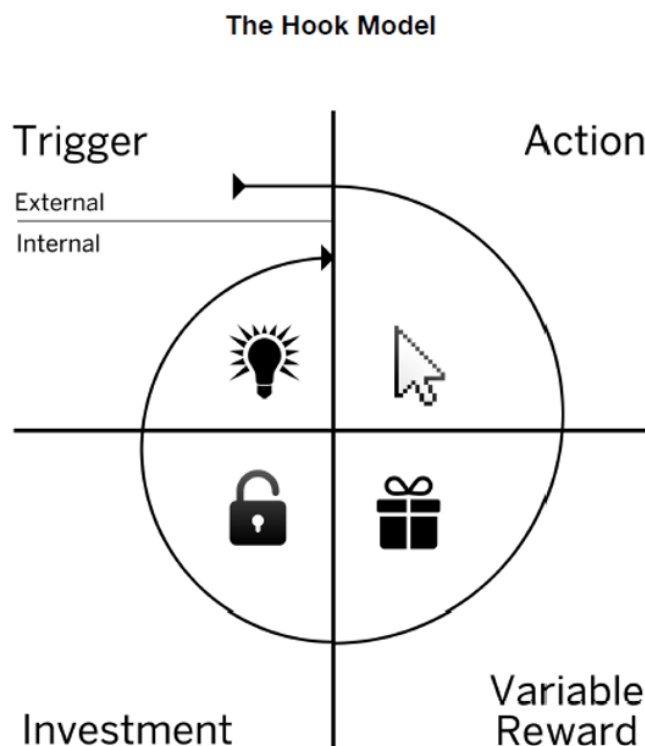


Figure 46 The Hook Model, Source: Nir Eyal, *Hooked: How to Build Habit-Forming Products*, 2014

The idea is to use The Hook Model that was developed by Dr. Eyal, and based on the habit-building cycle, Figure 46.

The best way to see how the Hook Model works is to study an example.

Imagine that Tony, professor of software engineering, is developing a new training course. The course is “Programming by Python”. The course lasts 180 academic hours.

Tony designs the course to be delivered in a blended format - each student independently studies material in digital form, and does practical work that simulates software team work.

Through the course, Tony wants to achieve two goals:

(A) Students build habits of working in an Agile team

(B) Students build learning habits.



Design of Triggers

The habit-forming cycle starts with triggers. A “trigger” is the actuator of the habit. According to the Hook Model, there are two types of triggers:

- **External**, e.g. “Read the lesson!”,
- **Internal**, that tell the user what to do next through association saved in his memory. Often the negative emotions play the role of internal triggers.

Tony begins by designing external triggers. He divides the course into 90 two-hour blocks. Then, he sets-up the university’s Learning Management System (LMS) to send students emails containing triggers like:

- Read the next lesson in LMS!
- Join the Agile Stand-up meeting tomorrow at 8.30AM!
- Prepare for Code Review session tomorrow at 9.00!
- Prepare to represent the code you wrote tomorrow at 9.00!
- Solve the problem!
- Write a piece of code that
- Check if the code written by a team-member meets the standard.

The result of Tony’s efforts is, that every student will receive at least 90 trigger-mails, which aim to initiate specific behavior – to read a lesson, to prepare for Code Review, etc.

It is very likely that if for 40 days a student has received trigger-email to join a Stand-up meeting and suddenly does not receive such an email, a negative emotion will arise that will make the student to check what happens and try to join the Stand-up.

Design of Actions

According to the Hook Model, “Action” is the behavior done in anticipation of reward.

Tony designs each two-hour block for students to study independently in following manner:

- ① A simple task that the student has to solve in 2 minutes. For instance, to wrote one-row programming code that checks if some logical condition is true or false
- ② Chunk of knowledge 1:
 - Five minutes video lesson
 - Ten minutes videos with examples
 - Test to check understanding
- ③ Chunk of knowledge 2:
 - Five minutes video lesson
 - Ten minutes videos with examples
 - Test to check understanding
- ④ Chunk of knowledge 3:
 - Five minutes video lesson
 - Ten minutes videos with examples
 - Test to check understanding



- ⑤ Set an interesting homework assignment that requires literature research
- ⑥ At the end of each block a riddle is presented, with the promise that students will learn its solution in the next block.

The Tony's goal is for students to develop a habit of learning material in a particular structure. The steps ① to ⑤ do represent the student's learning behavior Tony wants to form.

Design of Variable Rewards

Rewards are what motivate students to perform the behavior designed by Tony.

The Hook Model uses three kinds of rewards:

- **Rewards of the tribe:** the search for social rewards fueled by connectedness with other people.
- **Rewards of the hunt:** the search for material resources and information.
- **Rewards of the self:** the search for intrinsic rewards of mastery, competence, and completion.

For "Programming by Python" course Tony designs following rewards:

Rewards of the tribe

- The homework solutions of each student are published in. Any student can see and like them or share them, in the same way as in Facebook or LinkedIn.
- The practical work is developing software in an agile team. This includes a daily Code Review. Every team member prepares to represent his/her piece of software code and gets feedback from other team members.
- The student shares their code in open source manner and receive feedback from the society.

Rewards of the hunt

- Solving interesting homework assignments that require literature research brings the student new knowledge and practical skills. These are important assets for the student.
- Tony designed the tasks and tests in ① to ④ to carry points, credits, badges, achievement of titles like "Junior Python programmer", "Senior Python programmer", "Expert in Python", "Python Guru".
- Personalized learning program for students who earned more points.

Rewards of the self

- Tony provides the students with the opportunity to achieve internationally recognized certification as Python professional,
- The students can participate programming tournaments,
- The students can choose subject to explore on their own.

Tony is constantly inventing new rewards that motivate students to go through the learning cycle one more time in order to achieve more likes, to receive a standing ovation from his colleagues during the code review, to get senior position in the team, and the like.



Investment phase

People appreciate the things they have created themselves. That's why Tony assigns students interesting individual tasks. The assignments are designed in such a way, that students get something that works and is useful. Positive results are an important motivator. They increase the odds that student will make another pass through the habits forming cycle.

Many products and services apply this habit-forming method:

- Soup opera,
- Agile project management method,
- Agile software development method,
- SCRUM,
- Training athletes,
- Cleaning teeth,
- Smoking,
- ...



Summary

This report represents “**O1 Digital Education Enterprise business model and processes**”, the first of the Digital Education Enterprise project’s outputs. It was developed within the project 2021-1-BG01-KA220-ADU-000026986 “Digital transformation: from adult-education institution to Digital Education Enterprise”, funded with the support from the European Commission.

The methodological framework used for the development of this output consists of five steps:

① Identification of external and internal education/training customer segments (target groups)

20 customer segments were identified that fall into 4 categories: Students, Corporate sector, Individuals, and Specific groups.

18 typical categories of education/training were identified.

A Matrix was created that shows the relationships between these customer segments and the corresponding education/training categories.

12 typical forms of education/training were identified, including those in digital form.

② Design of value propositions to all segments identified at step ①, based on Digital enterprise concept

Detailed value propositions were developed for these customer segments. We used The Value Proposition Canvas for this purpose. It is convenient business tool to design and communicate value propositions.

Any educational/training institution can use these value propositions and fit the suitable ones to its own purposes.

The analysis of the developed value propositions showed that they could be reduced to 4 generic value propositions to **Students, Corporate sector, Specific groups, and Individuals seeking training on their own**.

③ Design of Digital Education Enterprise Business models, which produce and deliver the Value propositions devised at step ②

Detailed Digital Education Enterprise business models were developed, which produce and deliver these 4 generic value propositions. We used The Business Model Canvas for this purpose. It is convenient business tool to design and communicate business models.

The key elements of these 4 business models were explained in detail.

The digital enterprise’s and the service management system’s concepts were built in these business models.

How the key elements of Digital Education Enterprise business models work was explained and demonstrated by examples.

Any educational/training institution can use these business models and fit the suitable ones to its own purposes.



④ Design of the core processes that implement Digital Education Enterprise's Business model and that help provide quality education services

There exists variety of ways to implement some of the Digital Education Enterprise's business models designed within this project. We designed a business process that provides a lean way to implement Digital Education Enterprise's business model.

We designed business processes that realize Digital Education Enterprise's key activities which are common for all of the business models under this project: Production of Digital Education Content; Education, Certification, Validation of competences; Automated processes for individualized training; and Education Service Management System Operation.

Different scenarios for implementing the process for Education, Certification and Validation of competences are demonstrated.

Special attention is paid to the processes that provide smooth education/training service delivery management. For this purpose, the process approach and concept of ISO 20000-1 IT - Service Management Systems have been adopted.

A Matrix was created that identifies educational services processes which fulfill the Digital Education Enterprise core business processes to a full set of managed services delivery processes. The goal of this matrix is to help an educational/training organization in developing their specific digital transition plan to become Digital Education Enterprise.

⑤ Provision of guidelines how to create digital educational/ training services that form learning habits

Finally, we provide guidance and demonstrate how a habit-forming technology can be used to develop learning services that form learning habits.



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