Interreg CENTRAL EUROPE

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ReBuilt

D.1.4.1 – Concept of Fit for Circular and Digital MOOC

CZGBC

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Contents

Executive Summary

This document presents the concept, design, and implementation plan for the ReBuilt MOOC („Massive Open Online Courses“, or „e-learning“), developed as part of the “Fit for Circular and Digital Construction” program of the Rebuilt project. The MOOC targets multiple stakeholder groups—industry professionals, SMEs, architects, investors, public authorities, students, and the wider public—to promote the adoption of circular and digital construction practices in Central Europe. It integrates practical knowledge, regulatory frameworks, innovative technologies, and interactive digital tools to ensure learning is relevant, scalable, and engaging.

The MOOC is structured around **stakeholder-specific modules**, offering both **beginner and advanced** levels. **Content** includes video lectures, quizzes, co-created materials, and supplementary readings. The **Moodle LMS platform**, which hosts the MOOCs, ensures flexible course delivery, progress tracking, multilingual access, and tailored user experiences through cohort-based content access. Quality assurance is ensured through a multi-phase review process, including Train-the-Trainer workshops, pilot testing with participants, and post-launch feedback collection. Multilingual translation and review processes guarantee cultural and linguistic appropriateness across all target audiences.

A clear **dissemination and exploitation** strategy supports both awareness and long-term sustainability. The project will leverage partner networks, social media campaigns, newsletters, and the ReBuilt Final Conference to promote uptake. While the MOOC will remain freely accessible during and after the project, potential **monetization and sustainability** pathways are being **explored**, including integration into company training programs, CPD accreditation, and partnerships with public authorities. A detailed business plan for revenue generation will be elaborated after the project concludes.

The **selection of production methods** prioritizes **information accuracy and cost-efficiency**. The consortium has chosen a simple post-production approach using recorded lectures, ensuring high-quality content while optimizing resources. The technical specifications and implementation plan ensure a reliable, scalable, and user-friendly platform capable of hosting interactive and multilingual content.

In conclusion, the ReBuilt MOOC represents a strategically designed, innovative, and transnational learning solution that addresses a unique gap in the circular and digital construction education landscape. It provides a framework for skill development, capacity building, and knowledge transfer across Central Europe, with mechanisms in place for ongoing evaluation, improvement, and future monetization. By combining practical content, stakeholder-focused design, and sustainable dissemination strategies, the MOOC is positioned to contribute significantly to the transition towards circular and digital construction practices in the region.

Introduction

The ReBuilt project utilizes a MOOC as a final output of its Fit for Circular and Digital Construction program. In this document, we have developed the concept of the MOOC for selected target groups which revolves around sustainable construction practices and illegal dumping for a wide public which can be adopted by the everyday user. The MOOC's design integrates circular economy principles and digital technologies, aiming to provide accessible and practical knowledge to a broad audience.

This document presents the **concept, and implementation plan** for the ReBuilt MOOC. It outlines the target audiences, learning objectives, curriculum structure, technical requirements, and quality assurance measures. In addition, it describes the strategy for dissemination, evaluation, and future monetization opportunities, ensuring the MOOC's sustainability beyond the project's lifetime.

The content of the MOOC integrates circular economy principles, sustainable construction practices, and digital technologies, delivering knowledge in an interactive and modular format. By leveraging existing training materials, pilot testing, and stakeholder feedback, the MOOC has been designed to provide accurate, engaging, and regionally relevant learning experiences.

Finally, this document details the **analysis of production tools and methods**, testing of pilot videos, and estimation of capacities needed for content creation, forming the foundation for the selected production approach. It serves as a **comprehensive reference for the development, implementation**, **and long-term deployment** of the ReBuilt MOOC.

1. Concept Overview

1.1. Definition of MOOC

A MOOC, or Massive Open Online Course, is an online course aimed at large-scale participation and open access via the Web[1]. MOOCs provide access to tertiary-level courses and learning materials for anyone[2]. They often include video lectures, assessments, and discussion forums[3]. MOOCs are open to anyone, which allows interested participants to attend courses and access materials free of charge[4].

1.2. Objectives and Scope

The MOOC aims to support Central European stakeholders in **adopting circular and digital construction practices** by providing tailored, scalable, and interactive training. Its objectives are to:

- **Raise awareness** and build capacity for circular and digital innovation in construction
- Deliver modular, **practice-oriented training** adapted to specific stakeholder needs
- Demonstrate **best practices** and innovative technologies through engaging multimedia formats
- Facilitate **peer learning** and co-creation across regional and professional boundaries
- Promote **transnational knowledge transfer** and stimulate collaboration across sectors

The scope of the MOOC includes **five core modules** reflecting the key target groups plus cross-cutting digital and interactive elements. It targets construction professionals, public authorities, students, architects, trainers, and other actors along the construction value chain, aligning with the broader goals of the ReBuilt project and Deliverable D1.2.6.

1.3. Target Audience and Learning Outcomes

The MOOC within the ReBuilt project targets several key stakeholder groups to foster circular and digital practices in the construction sector. These include:

1. **Industry and SMEs:** Focusing on integrating sustainable materials, waste management regulations, and digital tools like BIM and digital twins. Manufacturers and suppliers of construction products are also a target, with training on sustainable sourcing, building material certification, and digital product passports D1.2.1)
2. **Architects and investors:** The program aims to equip them with the knowledge and skills to implement sustainable solutions in their respective roles (D1.2.4)

[1] Yousef, A. M. F., & Sumner, M. (2020). Reflections on the last decade of MOOC research. *Computer Applications in Engineering Education, 28*(6), 1679–1697. https://doi.org/10.1002/cae.22334

[2] Sigama, K., & Kalema, B. M. (2022). A model for MOOC implementation in areas of low bandwidth in developing countries. *International Journal of Distance Education Technologies, 20*(2), 1–17. https://doi.org/10.4018/IJDET.312182

[3] Harju, M., Leppänen, T., & Virtanen, I. (2018). Interaction and student dropout in massive open online courses. *arXiv*. https://arxiv.org/abs/1810.08043

[4] Haron, H., Nordin, M. S., & Zainuddin, N. (2021). Digital education systems: Expanding access through MOOCs. *Journal of Data and Information Science, 6*(1), 1–18. https://doi.org/10.2478/jdis-2021-0001

3. **Governments and public servants:** They play a crucial role in establishing policies, regulations, and infrastructure to support the transition to circular and digital construction practices (D1.2.2).
4. **University and vocational students:** They are a key target, with the collaboration between experts and students promoted (D1.2.3).
5. **The general public:** The MOOC also aims to reach them with topics such as illegal waste dumping.

The MOOCs will be designed with target group-specific content, ensuring that each stakeholder group (e.g., SMEs, public authorities, students, architects, investors) receives training materials directly relevant to their professional needs. Learners will have the flexibility to select the training track corresponding to their target group and work with the modules designed for that audience.

1.3.1. Train-the-Trainer

Additionally to the target groups, the MOOCs will be designed in conjunction with D1.4.2 Train-the-Trainer Online Course. Under the D1.4.2, at least **15 trainers** from the **consortium** and **outside** will participate in an on-line course. Before the training **draft** of the **tutorial** will be prepared. The trainers will also provide their **feedback on how to improve** the MOOC.

2. Curriculum Design

The MOOC will synthesize the five Modules developed in D1.2.6 into a flexible online format, using the following strategy:

- Structure of modules and themes derived directly from D1.2.6 training outlines.
- 2 levels of learning (beginner + advance) enabled by quizzes in the Moodle (Learning Management System)
- Utilization of the recordings of the already delivered course
- Creation of new videos where needed (e.g. course on illegal waste dumping for wide public)
- Adding reading lists and additional sources of information as an advanced level of learning, incl. utilizing sources collected in the D.3.1.3 "Package of guidelines and tutorials".
- Translation of practical learning methods into digital equivalents: where possible, we will aim to include 360° virtual tours to provide an equivalent of live site visits
- Peer learning enabled via:
    - Connecting to the Regional Circular and Digital Construction Hubs (D.3.3.1)
    - Inserting links to Expert groups on certain topics: e.g. listing LinkedIn or other communities (associations, real-life forums), where people discuss the challenges in the areas

2.1. Course Structure

The MOOC is currently structured into a suggested breakdown of modules, derived from the results of Deliverable D1.2.6 and Activity 1.3. This structure provides a clear framework for initial content development and partner coordination. However, the final configuration of the modules remains flexible and will be refined during project implementation. Adjustments may be introduced based on feedback from course creators and trainers, outcomes of internal testing. This adaptive approach ensures that the MOOC remains user-friendly, pedagogically sound, and aligned with stakeholder needs across Central Europe.

2.1.1. Detailed Module Breakdown

2.1.1.1. University and vocational students (TUW, HM)

Module 1: Legislation and Regulatory Framework

Module 2: Novel Research Approaches towards Circular and Digital Practices

Module 3: Towards Low Carbon Technologies in Construction

Module 4: Geopolymers and Secondary Raw Materials, corrosion measurements of steel in new binders

Module 5: Circular and Digital Construction in Application

2.1.1.2. Government, Public Sector (POR)

Module 1: Circular and Digital Economy in Construction

Module 2: Legislation and Regulatory Framework

Module 3: Environmental Product Declaration

Module 4: Good Practices across Europe

2.1.1.3. Industry, SME, architects and investors (ŠGZ) (2 groups merged)

Due to the strong overlap in topics and learning needs, the originally separate target groups of industry/SMEs and architects/investors were merged into one, ensuring streamlined content delivery and avoiding duplication.

Module 1: Introduction on strategies, policies, gaps and opportunities

Module 2: Basic of Circular Construction

Module 3: Attestation and Verification of Circular Construction and Technologies

Module 4: Digitalisation in Construction and Spillover Sectors

Module 5: Sustainable Assessment and Planning in Construction Works

Module 6: Good Practices, Practical Demonstration and Training

2.1.1.4. Wide-public: Illegal dumping (ZAG)

Module 1: Introduction to Illegal Dumping (Beginner Level)

Module 2: Legal Framework and Reporting Mechanisms (Advanced Level)

Module 3: Community Mobilisation and Long-Term Prevention (Advanced Level)

2.1.1.5. Additional features:

- Quizzes to enable proceeding to the advanced level of learning
- Where possible, recorded 360° construction site virtual tours
- Videos from co-creation activities and workshops (e.g. Innovation Cafés, Community-Based Innovation Events)
- Additional readings: Playbooks and methods from other projects: how to guide cooperation, inspire actions

2.2. Technical and System Requirements

The full technical specifications for the set-up of the Learning Management System (LMS) are provided by ZAG within the procedure for selecting the Moodle platform provider. We hereby provide a list of necessary technical capabilities of the MOOC to ensure online but interactive format, adaptability to national languages and scalable participation in the long run.

1. Modular Course Structure
   - Ability to create multi-module courses with sequential learning paths
   - Use of topics for clarity
2. Quizzes and Assessments
   - Multiple-choice, true/false, matching, short-answer quizzes
   - Quiz-based advancement to next level/module or to receiving certification

3. Tracking & Completion
    - Individual progress tracking (by learner and admin)
    - Exportable reports for evaluation (D1.3.6) (e.g. completion rates, feedback collected)
4. Feedback & Satisfaction Collection
    - Use of feedback tool, e.g. online questionnaires, surveys, and/or discussion forums for feedback.
    - Anonymous or identified evaluation possible
    - Collect participant input for continuous improvement
7. Multilingual Support
    - Moodle configuration in English plus 8 partner languages.
    - Language selection per user profile
8. Media Integration
    - Support for Vimeo, YouTube, or file-hosted interactive media
    - Integration of visual learning materials, downloadable resources, and interactive playbooks/PDF/PPT files, URL
9. System Specifications
    - Platform: Deployment of the latest stable version of Moodle LMS.
    - Multilingual Support: Full support for at least 8 project languages (Czech, English, German, Hungarian, Polish, Slovenian, and others as required), including multilingual interface and subtitles.
    - Performance Optimization: Optimised loading speed and reliable operation, even with high traffic, to support 30+ concurrent users during testing and scalable expansion post-project.
    - Security & Backups: Secure hosting with role-based access control, data protection in line with GDPR, and regular automated backups.

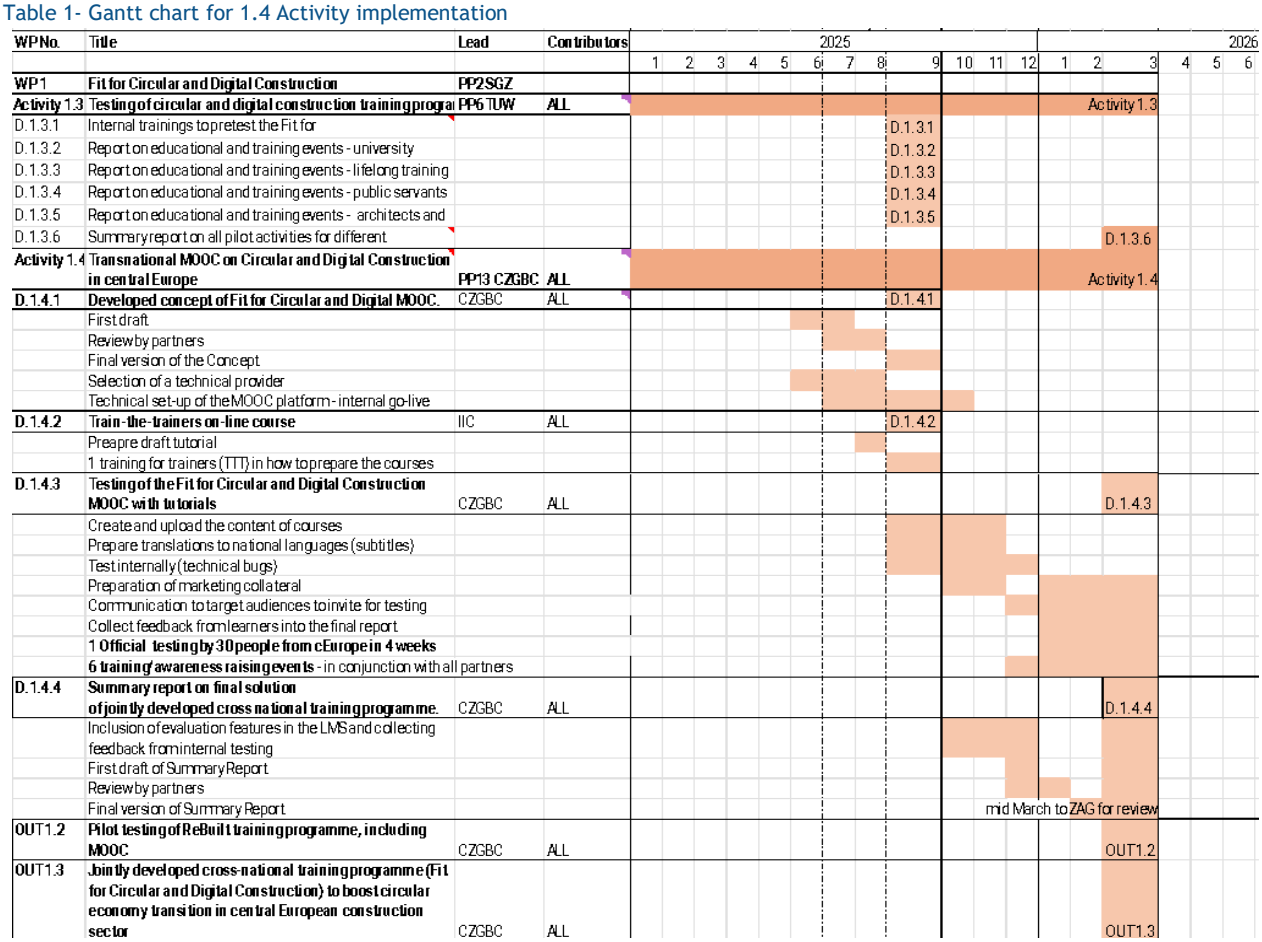
In the MOOC system, administrators will also act as trainers, with each project partner assigned an administrator/trainer role. To support their work, the contractor will prepare a technical documentation and step-by-step instructions for administrators, individual content administrators (teacher), participants (users). This approach ensures that all stakeholders have the necessary guidance to effectively operate the platform and contribute to the course delivery.

3. Implementation

3.1. High-level 1.4 Activity implementation plan

Table 1- Gantt chart for 1.4 Activity implementation

WP No.	Title	Lead	Contributors
WP1	Fit for Circular and Digital Construction	PP2 SGZ	
Activity 1.3	Testing of circular and digital construction training progra	PP6 TUW	ALL
D.1.3.1	Internal trainings to pretest the Fit for		
D.1.3.2	Report on educational and training events - university		
D.1.3.3	Report on educational and training events - lifelong training		
D.1.3.4	Report on educational and training events - public servants		
D.1.3.5	Report on educational and training events - architects and		
D.1.3.6	Summary report on all pilot activities for different		
Activity 1.4	Transnational MOOC on Circular and Digital Construction in central Europe	PP13 CZGBC	ALL
D.1.4.1	Developed concept of Fit for Circular and Digital MOOC.	CZGBC	ALL
	First draft		
	Review by partners		
	Final version of the Concept		
	Selection of a technical provider		
	Technical set-up of the MOOC platform - internal go-live		
D.1.4.2	Train-the-trainers on-line course	IIC	ALL
	Preapre draft tutorial		
	1 training for trainers (TTT) in how to prepare the courses		
D.1.4.3	Testing of the Fit for Circular and Digital Construction MOOC with tutorials	CZGBC	ALL
	Create and upload the content of courses		
	Prepare translations to national languages (subtitles)		
	Test internally (technical bugs)		
	Preparation of marketing collateral		
	Communication to target audiences to invite for testing		
	Collect feedback from learners into the final report		
	1 Official testing by 30 people from cEurope in 4 weeks		
	6 training/awareness raising events - in conjunction with all partners		
D.1.4.4	Summary report on final solution of jointly developed cross national training programme.	CZGBC	ALL
	Inclusion of evaluation features in the LMS and collecting feedback from internal testing		
	First draft of Summary Report		
	Review by partners		
	Final version of Summary Report		
OUT1.2	Pilot testing of ReBuilt training programme, including MOOC	CZGBC	ALL
OUT1.3	Jointly developed cross-national training programme (Fit for Circular and Digital Construction) to boost circular economy transition in central European construction sector	CZGBC	ALL



The implementation of Activity 1.4 combines pilot testing of training formats with the development, testing, and refinement of a Massive Open Online Course (MOOC). Following the Concept, the consortium will proceed with the design of the MOOC content and its translation. The feedback collected from the Train-the-Trainer on-line course (D.1.4.2) will serve for further improvement and refinement of the content of the MOOCs, transitioning to the Activity 1.4.3.

3.1.1. Testing and Validation of the MOOC (Activity 1.4.3)

The implementation of the MOOC content represents the most demanding phase in terms of team capacities. During this stage, the consortium will **create and upload the full online content**, including quizzes, interactive elements, and supplementary materials, and will conduct thorough **testing** to ensure accessibility and usability across all target groups. All content development will be **finalized by the end of 2025,** allowing the MOOCs to enter structured **testing in the first quarter of 2026.**

In parallel, from **October to December 2025,** we will prepare **marketing collateral** and launch a promotional **campaign** to attract early learners and generate visibility for the upcoming courses. The **testing**

phase itself will take place in **Q1 2026** and will run for a minimum of four weeks, following the typical self-paced format of MOOCs.

This process will also include:

- preparing translations and subtitles in national languages,
- conducting internal technical testing,
- organizing six awareness-raising events in cooperation with all partners, and
- carrying out an official pilot with at least 30 participants from across Central Europe.

Feedback gathered through these activities will directly feed into the refinement of the training programme and the D.1.4.4 Summary report on final solution of jointly developed cross national training programme.

3.1.2. Evaluation and Final Reporting (Activity 1.4.4)

The last phase ensures systematic evaluation and documentation. Evaluation features will be embedded in the learning management system to capture participant experience and performance. A summary report will be drafted, reviewed by partners, and finalized, providing a comprehensive overview of the jointly developed cross-national training programme (D.1.4.4).

3.1.3. Expected Results and Outputs

The implementation plan ensures that by March 2026, the project delivers:

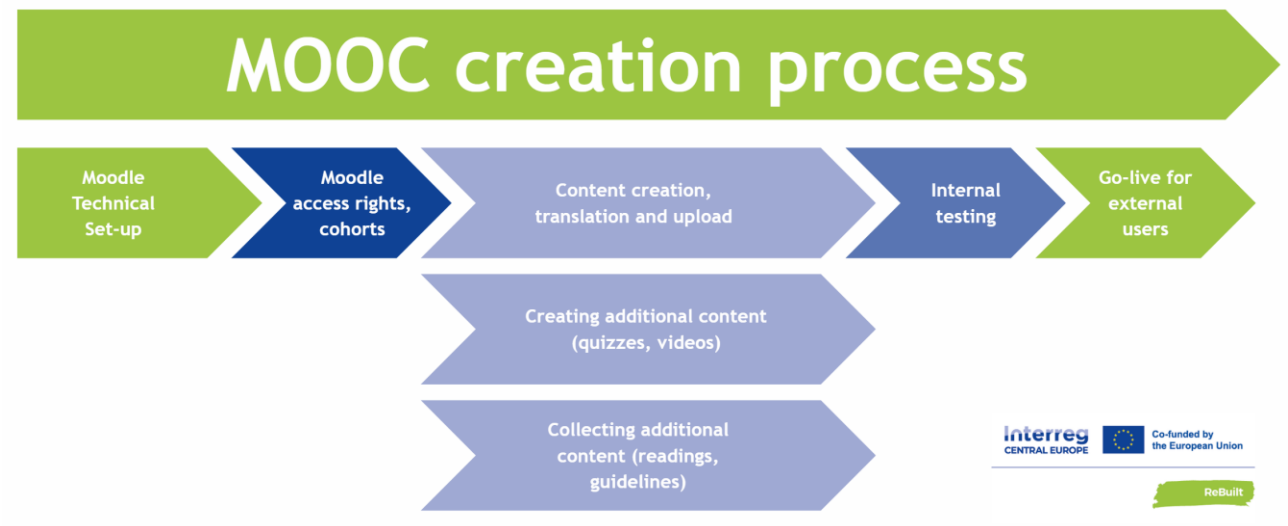
OUT 1.2: Pilot-tested ReBuilt training programme, including the MOOC.

OUT 1.3: A fully developed, transnational training programme on circular and digital construction, designed to accelerate the circular economy transition in the Central European construction sector.

3.2. MOOC content creation process

The creation of the MOOCs involves a series of coordinated steps and the use of multiple tools to develop engaging online content with high informational value. Typically, we leverage videos recorded from previous online trainings, which are then segmented into discrete topics for easier navigation. Trainers design quizzes to support learners' progression to more advanced levels and provide opportunities to explore additional resources. All videos are subtitled in English and the 8 national languages of the consortium to ensure accessibility for all participants. The Moodle administrators then upload all content to the platform—including videos, quizzes, and supplementary readings—and conduct thorough testing to ensure that everything functions smoothly.

Figure 1: MOOC creation process



3.3. MOOC video production & translation – Steps

The post-production of each MOOC video involves several key steps: trimming the presentation segments, generating subtitles, reviewing the English version, translating subtitles, reviewing the translations, uploading the translated subtitles, and storing all final content. Based on our assessment, the minimum total capacity required for the post-production and translation of a single MOOC video is approximately 270 minutes.

Table 2: Steps post-production of the MOOC videos indicating responsibilities, tools proposed and estimated capacity

Step Number	What to do	Responsible	Description	Tools to be used	Capacity needed for 1 video
1	Trim the presentation from the video	Presentation owner (or his delegated colleague)	1.Take the recording of the whole lecture 2.Cut out unnecessary parts and keep only your presentation 3.Add intro and outro slide	Canva - Free of charge / or within the license owned by the respective partner	20 minutes

			4.Export the edited video to MP4 format and upload to the shared G-Drive		
2	Generate subtitles	Presentation owner (or his delegated colleague)	1.Upload the video to any Youtube channel as “unlisted” (not visible in the search) 2.Switch-on subtitle creation - automatically generated 3.Save and publish all changes	Youtube - free of charge	20 minutes
3	Review English version	Presentation owner (or his delegated colleague)	1.Open the Youtube video editor - section Subtitles and click on EDIT 2.Review the whole video in the subtitle editor and correct any mistakes in the automated subtitles. 3.Save all changes	Youtube - free of charge	20 minutes
4	Translate subtitles - technical	Presentation owner (or his delegated colleague)	1A. Auto translate the subtitles in Youtube and download .srt files. 1B.Copy the URL of your video to the website app: https://downsub.com/ 2. Download: Croatian, Czech, English, German, Hungarian, Italian,Slovak, Slovenian, Polish subtitles in the .srt format and save it. 3.Send the translations to the respective partners for review.	DownSUB - free of charge	10 minutes
5	Review of translations	ALL partners	1. Partners review and correct the subtitles 2. Partners send it back	Notepad - free of charge (part of essential tools on Windows)	20 minutes each language (20*8= 160 minutes for all language variants)
6	Upload of translated subtitles	CZGBC/ Presentation owner (or his delegated colleague)	1A. Save .srt files of subtitles. 1.B Add translated subtitles back to the video in the Youtube studio - Subtitles section 2.Publish all changes	Youtube - free of charge	20 minutes

7	Storing all content	CZGBC/ Presentation owner (or his delegated colleague)	1.Download all videos 2.Download all subtitles	Browser – free of charge	10 minutes
8	Embed Youtube videos to MOODLE	ZAG LMS Specialist / Moodle admin	1.A Embed Youtube videos to the Moodle 1.B Upload video and 9 subtitle files to the LMS	Moodle – hosted by ZAG	10 minutes

Translating to the national languages – responsible partners:

1. English – each partner who delivered the presentation
2. German – HM/TUW
3. Hungarian – BURST/WMOH
4. Italian – InforData/Opencontent
5. Croatian – POR
6. Czech – CZGBC
7. Slovak – IIC/ÚSTARCH
8. Slovenian – ZAG/ŠGZ/NIGRAD
9. Polish – IETU

To efficiently complete these post-production and translation activities, responsibilities will be divided among all partners in the consortium as indicated in the table and list above. We will primarily use free-of-charge tools to ensure a cost-effective process while minimizing the need for manual translations.

4. MOOC Exploitation Strategy

4.1. Monetization and Sustainability Plan

While the Circular and Digital MOOC will be launched as a free educational offering on the Moodle platform during the ReBuilt project and up to 5 years after its end, we are actively exploring the opportunities for sustainability.

Given the urgent demand for upskilling in sustainable construction, driven by the **EU Green Deal**, the **European Skills Agenda**, and the **Pact for Skills in the Construction Ecosystem**, we see a strong opportunity to embed the MOOC into the workforce development strategies of construction-sector stakeholders.

Our monetization and sustainability approach is based on the following:

1. **Direct Collaboration with Companies**: Rather than focusing on global MOOC platforms, we will prioritise offering the course directly to companies in the construction and real estate sectors. Modules can be integrated into their internal Learning Management Systems (LMS) or delivered as part of in-house training. Contract-based partnerships would enable companies to access tailored training, co-branding, or additional language versions.
2. **Support for ESG and Skills Compliance**: The MOOC aligns with the growing need for companies to demonstrate compliance with sustainability reporting (e.g., CSRD, Taxonomy, SFDR) and workforce transition planning. Positioning the course as part of ESG and skills development strategies enhances its value and justifies cost-sharing or fee-based models.
3. In addition to professionals and companies, **public officials** represent a strategic and under-served target group for the Circular and Digital MOOC. Municipalities, regional authorities, and public procurement officers play a key role in shaping the built environment through planning decisions, permitting, and the allocation of public funding for construction and renovation projects. Yet, awareness and capacity related to **circular principles, sustainable public procurement, and whole-life carbon considerations** remain low across many EU countries. The European Commission's **Level(s) framework**, the **EU Green Public Procurement (GPP) criteria**, and national climate targets increasingly require that public authorities integrate circularity and sustainability into building-related decisions. Offering a tailored version of the MOOC or selected modules for **civil servants, urban planners, and technical departments** could support public sector compliance and leadership, while also opening up opportunities for strategic partnerships with ministries, municipal training centres, or EU-funded competence centres.
4. **As an alternative scenario, we are considering seeking CPD accreditation** for selected MOOC modules to enhance their value for professionals in the construction and real estate sectors. CPD-accredited training would allow learners to earn recognised credits or certificates that contribute to their professional development requirements. This could increase the attractiveness of the course for companies and individuals alike, particularly in regulated professions such as architecture, engineering, and construction management. Accreditation would also support integration of the MOOC into formal upskilling pathways and national qualification frameworks, opening opportunities for collaboration with professional chambers and lifelong learning providers.

4.1.1. Visual and audio upgrade

For in-company use (points 1, 2), we aim to upgrade the MOOC videos to make them more attractive and engaging by using AI video generation tools and to increase the quality of video and audio recordings for a

pleasant experience. These tools enable the creation of dynamic, professional-quality videos with multilingual voiceovers, branded visuals, and tailored content adaptations. By enhancing the visual and narrative quality of the training materials, we can better align with **corporate learning standards** and **increase the likelihood of integration into internal Learning Management Systems (LMS)** as part of structured upskilling or onboarding programs.

Table 3 : Alternative MOOC trainings in the market

Training	Focus Area	Format & Provider	Pricing / Credentials
Circular Building Products for a Sustainable Built Environment (TU Delft via EdX)	Product development, business models, digital tracking of building materials	5-week online course; case studies, group work on Miro	Approx. €716–895; 2.5 CEUs offered
Engineering Design for a Circular Economy (TU Delft via EdX)	Circular product design ("Design for R")	6-week MOOC, self-paced, open/free with paid certificate	Free or $249 certificate; engineering competencies
Circular Economy for a Sustainable Built Environment (TU Delft Extension / OpenCourseWare)	Circularity at scale: from component, building to city	Structured MOOC with regional focus; free learning materials, certificate available	Self-paced; certificate of completion; license CC-BY
Global Circular Economy for the Built Environment (RICS)	Whole-life carbon, circular design in construction	CPD webinar (recorded); professional short course	£26–35 per person for RICS members/non-members
Circular Built Environment Specialist Certificate (Circular Economy Institute)[5]	Professional credential in circularity applied to buildings	Self-paced programming, exams, project work	£552; includes certification aligned with ISO standards

[5] The cited course is no longer accessible online as the course has since been removed from the website.

4.1.2. Positioning the ReBuilt MOOC

To ensure the ReBuilt MOOC addresses a clear gap in the current training landscape, we have defined its unique positioning based on target audience, content focus, and regional accessibility:

1. **Unique niche:** The ReBuilt MOOC is the only course we found specifically addressing a full-stack focus on circular and digital **construction**, integrating topics such as illegal waste management, digital tools, geopolymers, and legal-policy awareness.

2. **Tailored for SMEs, public bodies, and universities:** Unlike global MOOCs that primarily target **general** audiences, ReBuilt is designed to meet the specific needs of stakeholders across the construction value chain.

3. **Multilingual and regionally customised:** The MOOC offers content in English and 8 other languages that are rarely supported in competing courses—ensuring greater accessibility and relevance for Central European learners (e.g. Slovenian, Croatian, Czech, Slovak, Polish)

4.1.3. Target groups and target market

Based on our preliminary analysis of potential monetization opportunities, we have identified and prioritized the following target groups:

Company employees

The construction ecosystem contributes nearly 5.5% to the EU's GDP and provides employment to approximately **25 million people** across over 5 million companies[6,7]. Within this ecosystem, the EU building products industry alone comprises around 430,000 companies, generating a combined turnover of €800 billion. The vast majority of these businesses are small and medium-sized enterprises (SMEs), underscoring the sector's fragmentation and the need for scalable, accessible training solutions[8].

Public Officials

Based on Eurostat data, general government employment accounts for around 16–18% of total EU employment. In 2024, the EU workforce (aged 20–64) numbered approximately 197.6 million individuals. Applying a 17% average, this group includes an estimated 33.6 million public sector employees.[9]

Among these, we are applying a conservative estimate that 5%, **1.7- million staff** across the EU, are likely working in built-environment-related roles—covering e.g. urban planning, permit management, technical services, infrastructure, energy performance of buildings, material legislation, waste management and public procurement.

These figures point to a substantial audience of public officials who would benefit from targeted MOOC modules on circular and digital construction practices.

[6] Council of the EU. (2024, November 5). *Building materials: Council adopts law for clean and smart construction products*. https://www.consilium.europa.eu/en/press/press-releases/2024/11/05/building-materials-council-adopts-law-for-clean-and-smart-construction-products

[7] European Commission. (2024, November 5). *Energy Performance of Buildings Directive*. https://energy.ec.europa.eu/topics/energy-efficiency/energy-performance-buildings/energy-performance-buildings-directive_en

[8] Council of the EU. (2024, November 5). *Building materials: Council adopts law for clean and smart construction products*. https://www.consilium.europa.eu/en/press/press-releases/2024/11/05/building-materials-council-adopts-law-for-clean-and-smart-construction-products

[9] European Commission. (2024, November 5). *Energy Performance of Buildings Directive*. https://energy.ec.europa.eu/topics/energy-efficiency/energy-performance-buildings/energy-performance-buildings-directive_en

Over the next five years, we will focus on the dissemination of the ReBuilt MOOCs to maximize reach and engagement, laying the groundwork for potential monetization in the future. At this stage, our priority is to **reach a broader audience and increase visibility** across the Central European construction ecosystem. To support this, we are exploring opportunities such as the **Interreg Central Europe Capitalisation Call,** which would enable us to showcase the MOOCs, attract early learners, and establish a strong foundation for subsequent monetization strategies. A more detailed business plan, outlining concrete monetization models and revenue projections, will be elaborated after the project's completion.

4.2. Marketing and Dissemination Strategy

In collaboration with the **lead partner for Dissemination and Communication Activities - Chamber of Commerce and Industry of Štajerska (ŠGZ)**, a coordinated campaign will promote the launch and uptake of the MOOC across Central Europe.

Key promotional actions will include:

- **Integration into ReBuilt Final Conference (Q1 2026):**
  The MOOC will be officially launched and demonstrated during the final project event, with live participant sign-ups by QR code. If possible, a teaser video or live walk-through of the course platform will be showcased.
- **Partner Networks Activation:**
  All project and associated partners will be mobilized to disseminate the MOOC within their professional ecosystems, chambers of commerce, public bodies, academia, and NGOs. Each partner will receive an outreach kit (e.g. graphic design, suggested text, templates) with a possibility to adapt it to the national audience. Partners will be encouraged to contribute, for example, one newsletter feature, several social media posts, and at least one mention in an online or in-person event.
- **Social Media Campaigns:**
  Coordinated campaigns across partner's Social Media, highlighting the MOOC modules, testimonials, and interactive elements. A suggested content calendar may include:
  - Weeks 1–2: Introduction to the ReBuilt project and its objectives.
  - Weeks 3–4: Expert or trainer interviews and teaser content.
  - Weeks 5–6: Module spotlights emphasizing key learnings, tools, and benefits.
  - Weeks 7–8: Testimonials from pilot users and a registration push.

  Visual assets to support these campaigns may include benefit-oriented infographics, animated overviews of modules, and short video statements from instructors and pilot participants.

Table 4 : Suggested Social Media posting strategy

Platform	Content Type	Frequency	Responsible Partners
LinkedIn	Expert posts, trainer features	2× weekly	ŠGZ -All partners
Facebook	Testimonials, polls, visuals	3× weekly	ŠGZ -All partners
Twitter/X	Short updates, module links	2× weekly	ŠGZ -All partners
YouTube	Short (1–3 min) videos - from videos	Weekly	ŠGZ -All partners
*Twitter/X and YouTube are not available for all partners. We can prepare the content and distribute it to partners, who will then post it through their own channels or networks where applicable.			

- **Newsletters and Partner Publications:**
  Announcements will be distributed via ReBuilt newsletters, project mailing lists, and associated partner platforms to ensure broad outreach to relevant stakeholders.

5. Quality Assurance and Evaluation

5.1. Peer Review Process & External Expert Review

To ensure the MOOC's quality, the first modules will be piloted within the **Train-the-Trainer workshop (D1.4.2)**. Draft tutorials and modules for 1 selected target group will be reviewed by at least 15 trainers from consortium partners and external experts. Their input will be used to refine both the content and the pedagogical approach before the official launch.

Feedback from learners will be collected in four phases:

1. **Train-the-Trainer workshop (D1.4.2):** Trainers test the draft modules and provide structured feedback on content and delivery.
2. **Internal testing:** The implementation team reviews and tests the course before user release.
3. **Pilot testing (D1.4.3):** 30 users from across Central Europe participate over a minimum of 4-week period, providing feedback through questionnaires or interviews.
4. **Post-launch evaluation:** Feedback mechanisms will be integrated directly into the Moodle platform to enable learners to provide input at any time throughout the duration of the MOOCs.
5. **Multilingual Review**: Since the course will be available in multiple languages, all translations will be reviewed by native speakers from project partner organizations to ensure both linguistic accuracy and cultural appropriateness

User experience, content clarity, and professional relevance will be assessed through online questionnaires and Moodle analytics (e.g., completion rates, engagement levels). This combined process of trainer review and learner-driven feedback will ensure ongoing improvement and long-term relevance of the MOOC.

5.2. Evaluation Metrics and Data Analysis

Based on the outcomes of the **peer-to-peer review and training events** the final MOOC will be prepared for initial testing. **At least 30 participants around the programme area will participate in 4 weeks** of the MOOC training. During the MOOC training, participants will advance to the **next level** by **quizzes**.

The testing will be proved by submitting the Deliverable: D.1.4.3 Testing of the Fit for Circular and Digital Construction MOOC with tutorials.

The MOOC will be **primarily evaluated through the Moodle platform**, which offers a range of assessment tools. During the 4-week training period, participants will complete quizzes to demonstrate their progress and knowledge acquisition. The platform's analytics will be used to track engagement, completion rates, and learner performance.

Additionally, the MOOC will include **feedback surveys and discussion forums** embedded in the Moodle, enabling participants to provide their insights and suggestions for improvement. This data will be analysed to evaluate the overall effectiveness of the MOOC and identify areas for enhancement in future iterations.

If feedback collected through Moodle's built-in mechanisms and platform analytics is insufficient to draw comprehensive insights, we will **complement** these data sources by reaching out to learners individually. This may involve distributing **questionnaires** or conducting short **interviews** to capture qualitative feedback

on course content, usability, engagement, and learning outcomes. These additional measures will ensure that the post-launch evaluation provides a robust evidence base to inform future improvements and refinements of the MOOCs.

Conclusion

The ReBuilt MOOC provides an **accessible, and scalable solution to upskill stakeholders** in circular and digital construction. By combining stakeholder-specific content, interactive digital tools, multilingual support, and evaluation processes, it **addresses a critical gap in the current training** landscape in Central Europe.

A **thorough analysis of available tools and production methods** was conducted, including pilot video testing and estimation of the capacities required for full-scale production. This process enabled the consortium to select the most suitable production method, balancing cost-efficiency, content accuracy, and engagement.

Post-launch evaluation mechanisms, including Moodle analytics, surveys, and potential individual follow-ups, guarantee continuous improvement and long-term relevance.

Looking forward, we aim to further disseminate the ReBuilt MOOCs by applying to the Interreg Central Europe Capitalisation Call, ensuring **broader regional outreach** and maximizing impact on circular and digital construction practices across Central Europe.

Annex 1 - List of additional content

Case studies

Where possible, the MOOCs will incorporate engaging case studies showcasing best practices in circular construction and digital innovation. A preliminary list of examples has been identified, and during implementation, we will ensure that the consent of the owners of any videos, presentations, or other materials is obtained prior to inclusion. This approach will enhance the practical relevance of the courses, provide learners with real-world insights, and maintain compliance with intellectual property and data protection requirements.

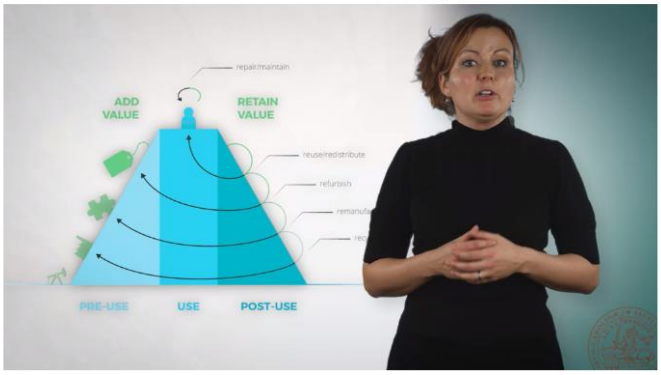
Table 1: List of potential case studies which can be included in the MOOCs after approval of the owners

Organization (Owner)	Topic	Format	Duration
NIGRAD	CINDERELA project featuring the recycled material construction (house and road)	video	10 minutes
SKANSKA	Re-molition project of MERKURIA - demolition made by dismantling	presentation recording or video	15 minutes
HEMPSATIC	Chem-free, plastic-free and toxic-free insulation	presentation recording or video	10 minutes
Saint-Gobain	Recycling of Rigips plasterboards	presentation	5 minutes

Annex 2: Analysis of existing MOOCs - Design

We have conducted an analysis of existing MOOCs in the area of circular economy to see what is currently in the market and what are the best practices in the field. We have not found any course particularly addressing circularity and digitalisation in the construction sector. We provide several examples of the courses found.

[Circular Economy - Sustainable Materials Management Lund University](#) (Coursera)



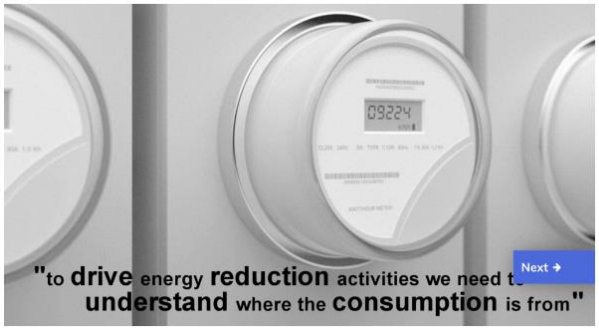
The *Circular Economy - Sustainable Materials Management* MOOC by Lund University (Coursera) features a presentation-style format, with the speaker positioned on stage as slides change in sync with the topic. Visuals transition from key terms to relevant illustrations, photos, and models, effectively supporting the narrative. The speaker delivers clear, straightforward explanations, with key principles emphasized through both speech and the evolving background visuals.

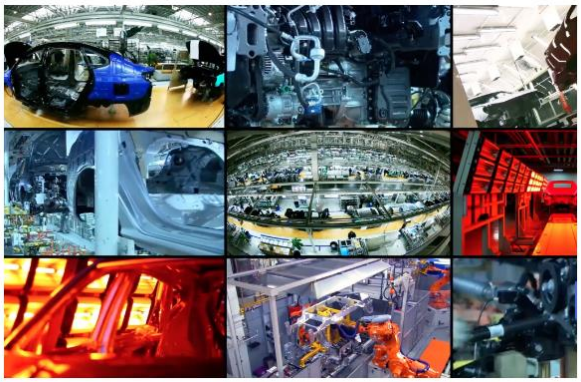
[Construction Project Management Columbia University](#)

The *Construction Project Management* MOOC by Columbia University uses a format similar to the Lund University course, featuring the speaker in a corner of the screen while dynamic backgrounds—videos,

images, and text—visually reinforce the concepts being discussed.

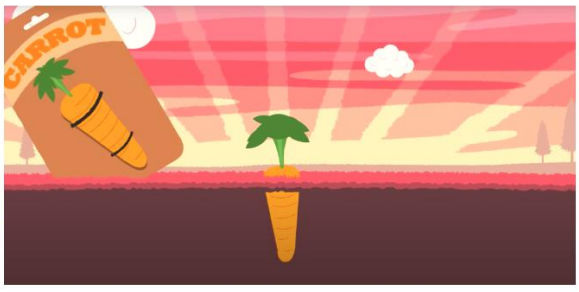
AVEVA

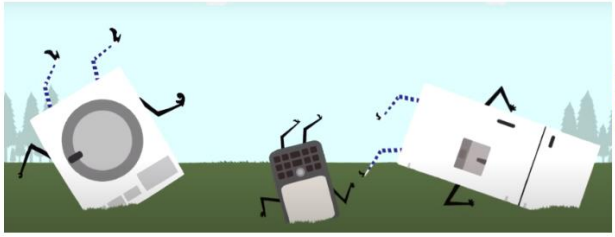




The AVEVA MOOC started with an interview-style format, showing the speaker alongside supporting graphics, with key points and quotes highlighted on screen. It then shifted to a voice-over narration, with the speaker off-camera while videos and visuals illustrated the content.

AMARA





The AMARA MOOC was delivered entirely through animation, using engaging, universally understandable visuals to support the voice-over narration. Following a storyline format with humorous elements—like inanimate objects with legs—it stood out as the most engaging and memorable, making complex topics easier to grasp.

Conclusions

Common themes

- Individual videos are roughly **5-10 minutes long** to ensure efficient teachings that maintain engagement.
- Visuals of **mind maps, diagrams, charts, and graphs** help illustrate the topic better.
- Using **smooth transitions** and **fun sound effects** as slides shift to new illustrations can enhance **engagement** by keeping the content dynamic and visually interesting.

Strengths

- **Animated MOOCs** may be the most effective format for translation and multilingual accessibility, as the visuals are universally understandable.
- **Voice-overs** can be easily adapted using **AI tools,** by inputting the script and generating audio in different languages for each version of the video.
- Some MOOCs had short **quizzes, polls, or "pause and think" prompts** after each section to better promote engagement and help the listeners test their understanding
- The use of **reflection questions** also seemed helpful.
- The offering of **transcripts or summaries** for each video.
- Incorporate **humour** or **light visuals** when possible, to maintain attention.

Challenges

- While on-screen text can enhance engagement by visually reinforcing key points, it presents challenges when creating **multilingual content.**
- Each **language** would require a unique version of the video, going beyond simple caption or subtitle translations, which makes the **production process more complex.**

Annex 3: Analysis of Technical Implementation

To determine the most suitable approach for producing the ReBuilt MOOCs, the consortium conducted a comparative analysis of different production scenarios, considering factors such as engagement, accuracy, technical requirements, cost of tools, and instructional designer workload. Three main methods were evaluated: fully AI-generated videos, simple post-production of recorded lectures, and a combination of both approaches. This analysis allowed the consortium to balance pedagogical quality, resource efficiency, and cost-effectiveness, ultimately informing the selection of the optimal production method for the project.

Table 1: Comparison of MOOC production method

Method	Pros	Cons	Costs for tools	Man Days of work of Instructional Designer for all videos
AI-generated video **(Scenario 1)**	Highly engaging Suitable for less advanced presentations	Editing of the more advanced content increases production time	HayGen: $180 =152,70 EUR	**26,4 Man Days**
Simple post-production **(Scenario 2)**	Suitable for more complex topics with charts and data	Less engaging Not typically used in MOOCs Worse audio recording	Subly: **$732 + applicable taxes** =622,16 EUR (885,72 incl, VAT)	**10 Man Days**
Combination **(Scenario 3)**	Providing a complex solution (engaging and specialized)	Requires use of multiple tools	HayGen: $180 =153 EUR Subly: $558.00 =473 EUR	**4,5 Man Days** **+ 10 Man Days = 14,5 Man Days**
LMS Technical Set-up				Man Days for LMS technical set-up: **5-10 Man Days** (estimate) - provided by ZAG
Quiz creation				Costs for quiz creation: **1 Man Day for each target group** (supplied by partners)

1. Scenarios of implementation

Assumptions and requirements:

1. Lectures for each target groups are recorded
2. 9 Language variants of videos are created: Croatian, Czech, English (original), German, Hungarian, Italian, Polish, Slovenian, Slovak

3. We create 2 levels of learning for each target group (basic/advanced)
4. Learning Management System enables quizzes to progress in learning (from beginner to advanced level)

Scenario 1 – AI generated videos

- All recordings are transformed into AI-generated videos. The presentations are split into 2 parts: intro (beginner) and specialized content (advanced).
- **Pros**: highly engaging
- **Cons**: **significant misinterpretation of information** from the original source is created by the AI generators, high working capacity needed for production (**increases price** by 3x compared to the simple postproduction according to our estimate)

Scenario 2 – simple - SELECTED

- All MOOCs are taken from the recorded lectures, cut into smaller presentations representing each module (Method 2)
- 2nd level may be offered via additional links and readings.
- **Pros**: the most cost-effective option, **ensures accuracy of information** provided in the presentation (it avoids AI misinterpretation)
- **Cons**: less engaging, smaller potential for audience reach/satisfaction compared to the MOOCs in the market

Scenario 3 - combination

- The recorded lectures are offered as a 2nd level and edited by the method 2 to trim unnecessary parts and comply with branding
- The beginner level is produced by generating simplified videos in AI generator from the transcript of lectures. We assume the costs for production may be half of the estimate (skipping the steps 4-7, and simplifying the language verification)
- **Pros**: satisfying both needs: an engaging and specialized content
- **Cons**: requiring work with multiple tools and additional capacity for AI generations and costs for multiple AI tools

The consortium has selected the **Scenario 2 which offers the best cost-effective solution** while ensuring the **highest level of information accuracy** of the data presented.

Below, we provide a detailed analysis of the tools, the production methods and capacity needed. In ANNEX 4, you can find the comparison of AI-generators tested for the MOOC creation.

2. Analysis of AI tools

Based on our assessment of existing MOOCs related to the circular construction theme, we decided to **explore an AI-based approach** to produce more engaging content. To this end, we:

(1) analysed AI tools for video and voiceover production, transcript extraction, and caption creation, and

(2) **tested the production of one video using two different methods:**

(a), an AI-generated video with voiceover using a recorded lecture, PowerPoint slides, and a transcript;

(b) a simplified post-production approach using Canva, where we edited the recorded lecture by trimming unnecessary parts and adding a branded intro and outro.

The AI video production tools were assessed using the following criteria:

(1) ability to generate content in all project partner **languages**—Czech, Croatian, English, German, Hungarian, Italian, Polish, Slovak, and Slovenian;

(2) capability to create **voiceovers**;

(3) automatic **caption** generation;

(4) the size and quality of the **built-in databank** of images and videos for backgrounds;

(5) flexibility to add **custom text and slides;** and

(6) the possibility to **edit transcripts**.

Based on the analysis, we selected two tools**—HayGen and Veed.io**—as the most suitable options, as both meet all evaluation criteria. Their pricing is also comparable: HayGen costs **$29-30 per seat/month**, while Veed.io ranges from **$21 to $53 per seat/month** depending on the plan.

The full analysis of the of the AI video production tool is included in the ANNEX 4.

The AI tools for caption creation

We also compared tools for subtitle creation and translation into partner languages, focusing on Subly and YouTube. While both allow caption generation, videos with captions from YouTube cannot be downloaded for further use, and its licensing options (YouTube standard or CC-BY) are not compatible with launching MOOCs on the Moodle LMS. Subly, by contrast, supports all required languages and offers flexible download options, with pricing ranging from $16/month for 720 minutes (5GB storage) to $30/month for 1 440 minutes (10GB storage) of video produced. The total subscription would account for **192-360 USD in total.**

The AI tools for transcript extraction

Most live training sessions are recorded via MS Teams, enabling automatic transcript generation at no extra cost.

3. Testing of MOOC Production

MOOC Creation Process via AI video generator (HayGen)

We hereby describe the process of creation a MOOC video via AI video generator.

1. **Initial Script Simplification Slide Structuring**

The script of the recording is uploaded in ChatGPT and simplified, shortened. For instance, a 15-minute presentation is transformed into a concise script of approx. 5 pages or 5 minutes.

The script is divided into logical slide sections—typically by sentence or key phrases—assisted by ChatGPT for clarity and flow.

Duration: 20 minutes

2. **Script Upload to HeyGen**

Each section of the script is uploaded into HeyGen, either manually or in bulk.

Duration: 20 minutes

3. **AI Video Generation**

HeyGen automatically generates a several-minute AI video per section based on the uploaded script.

Duration: 2 minutes

4. **Video Segmentation**

Longer videos needs to be manually split by sentences or keywords to enhance clarity and engagement.

Duration: 60 minutes

5. **Slide Enhancement and image references**

Specific slides are added from existing presentations, redesigned in Canva to match the script content visually.

Important note: For the original images, a reference to the source must be added to the slide in the video.

Duration: 60 minutes-2 hours (based on the content)

6. **Manual Video Editing**

Further editing ensures visual elements (e.g., images) accurately reflect the spoken content—this step is time-consuming but improves quality. Additional professional content (charts, visuals, etc.) from the original presentation is integrated into the video during the editing phase.

Duration: 60 minutes

7. **Final Export & Caption Generation**

The video is exported while adding automated captions - this approach results in more accurate timing and a cleaner visual layout.

Duration: 3 minutes

8. **Language Versions**

9 Language variants are created:

- Croatian
- Czech
- English
- German
- Hungarian
- Italian
- Polish
- Slovenian
- Slovak

Final scripts and subtitles undergo a language check by a native speaker to ensure clarity, correctness, and fluency.

Duration: a minimum of 2 hours for each language (1 hour - work of each partner for the respective country, 1 hour – adopting the changes in the script, if needed)

TOTAL DURATION OF AN AI-PRODUCED VIDEO FOR 1 LANGUAGE: 3,75-4,75 hours

TOTAL DURATION OF AN AI-PRODUCED VIDEO FOR ALL 9 LANGUAGES: 3,75+1h*8languages=11,75h

Costs for the production:

- Hay-gen: $29–30 per seat/month* 6 month subscription = **180 USD**
- MS Teams: **0** (as part of existing toolset of the respective partner)
- Costs of work of the Instructional Designer: approx. 25 modules/presentations/videos= 18*11,75 = 211,5 hours = **26,4 Man Days**

Number of modules: 25 in total

MOOC Creation Process via simple video post-production and additional caption generation

MOOC Creation Process via CANVA - simple video post-production

1. **Canva Slide Setup**

   A Canva presentation was created in landscape mode. Intro and conclusion slides were added with simple animations for a smoother visual effect.

   Duration: 5 minutes

2. **Video Trimming for Upload**

   The full MS Teams recording was downloaded and trimmed externally (using CANVA) to isolate the relevant presentation, since Canva limits the maximum video upload size.

   Duration: 10 minutes

3. **Upload and Final Trim in Canva**

   The trimmed video was uploaded to Canva.

   Additional trimming was done to cut out interruptions in throughout the middle of the presentation.
   Duration: 10 minutes

4. **Visual Cropping**

   The uploaded video was cropped to remove unnecessary parts of the screen, such as speaker views or Zoom toolbars, focusing solely on the presentation slides.

   Duration: 20 minutes

5. **Final Touches and Export**

   After cropping and aligning visuals, the final video was ready for export and upload.

   Duration: 10 minute

Canva creation total time: ~60 mins

MOOC Sub-caption Creations via Subly:

6. **Video Export from Canva to Subly**

   After completing the final edits in Canva, the video was exported and downloaded for subtitle processing, and uploaded to Subly.

Duration: 10 minutes

7. **Generating Subtitles**

   Once the video was uploaded, Subly automatically generated the base subtitles in the original language (e.g., English).

   Duration: 5 minutes

8. **Accessing Translation Panel**

   In the right-side panel under the “Subcaptions” section, the “Translations” option was selected from the top-right of the subtitle interface.

   Duration: 5 minute

9. **Multi-language Translation**

   Each desired language was selected individually (e.g., Czech, German, Hungarian, etc.), and the "Translate" button was pressed to generate subtitle translations.

   Duration: 5 minutes per language

10. Verification by native speaker

    Each video must be reviewed by the native speaker for clarity and coherence. If any errors spotted, these will be edited in the Subly tool directly.

    Duration: 60minutes - 30 minutes for video review and noting the errors + 30 minutes for manual edditing

11. **Final Language Selection Feature**

    The final video includes a language selector in the bottom corner, enabling viewers to choose from the translated subtitles via a dropdown menu.

    Duration: 5 minutes - Automatically enabled by Subly

12. **Export**

    The video is compiled with captions for final export.

    Duration: 10 minutes

Subly total time: ~ 100 minutes

TOTAL DURATION OF A SIMPLE POSTPRODUCTION OF 1 VIDEO FOR 1 LANGUAGE: 1,6 hours

TOTAL DURATION OF A SIMPLE POSTPRODUCTION OF 1 VIDEO FOR ALL 9 LANGUAGES: 1,6h + 9*10minutes (export of language variants) = 3,2 hours

Costs for the production:

- Subly**: $732 + applicable taxes** in total (18 modules*15minutes each (on average)*9 languages= 2 430 minutes) - ***each language variants consumes the minutes in the subscrption, resulting in high volume of minutes!*** (18 videos × 500 MB = **~8,7 GB)**
- CANVA: **0** (using free features or within the license owned by the respective partner)
- MS Teams: **0** (as part of existing toolset of the respective partner)
- Estimated capacity of the Instructional Designer: approx. 25 modules/presentations/videos= 25*3,2 = 50 80 hours = **10 Man Days**

1. **Initial Script Simplification Slide Structuring**

The script of the recording is uploaded in ChatGPT and simplified, shortened. For instance, a 15-minute presentation is transformed into a concise script of approx. 5 pages or 5 minutes.

The script is divided into logical slide sections—typically by sentence or key phrases—assisted by ChatGPT or alternative Large Language Model (LLM) for clarity and flow.

Duration: 20 minutes

2. **Script Upload to HeyGen**

Each section of the script is uploaded into HeyGen, either manually or in bulk.

Duration: 20 minutes

3. **AI Video Generation**

HeyGen automatically generates a several-minute AI video per section based on the uploaded script.

Duration: 2 minutes

4. **Video Segmentation**

Longer videos needs to be manually split by sentences or keywords to enhance clarity and engagement.

Duration: 60 minutes

5. **Language verification**

Native speaker from the respective partner verifies the 5 minute video and suggests changes, if needed. The instructional designer updates the changes in the AI generator.

Duration: 20 minutes

TOTAL DURATION OF AN AI-PRODUCED VIDEO FOR ALL 9 LANGUAGES: 2 hours

Costs for the production:

- Hay-gen: $29-30 per seat/month* 6 month subscription = **180 USD**
- MS Teams: **0** (as part of existing toolset of the respective partner)
- Costs of work of the Instructional Designer: approx. 18 modules/presentations/videos= 18*2 = 36 hours = **4,5 Man Days**

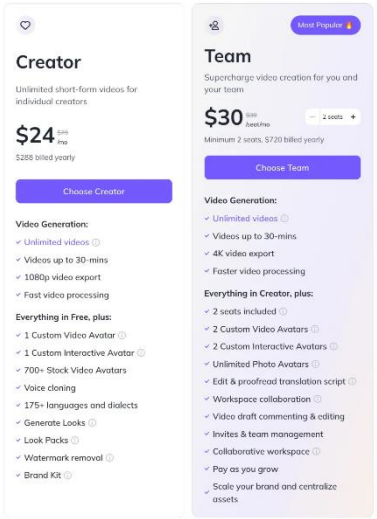
Annex 4: Analysis of AI-based tools

We conducted a thorough analysis of available tools for content creation, video production, and subtitle generation. The evaluation considered factors such as automation capabilities, customization options, multilingual support, ease of collaboration, and cost-effectiveness. Tools such as HeyGen, Canva (including Canva AI), Pictory, Lumen5, and Veed.io were assessed for their ability to transform scripts into engaging video content with interactive features, while subtitle creation tools including Subly and YouTube Studios were examined for their suitability in producing multilingual, accessible content. This analysis allowed us to identify an optimal combination of platforms that balances creative flexibility, speed of production, and scalability for the multilingual and regionally customized MOOCs.

Tools for the Design and Production of MOOCs

HeyGen

https://app.heygen.com/home



PROS:

- Turns scripts into voice overs or uses realistic AI avatars to narrate on the screen.
    - Voice's gender, tone, and pace can be edited.
- Allows you to add images, videos, or graphics to each slide, making it more dynamic and visually appealing.
- Narration and subtitles can be automatically translated into multiple languages
- Creates the feel of a human presenter without needing to record video
- Fast Video Generation

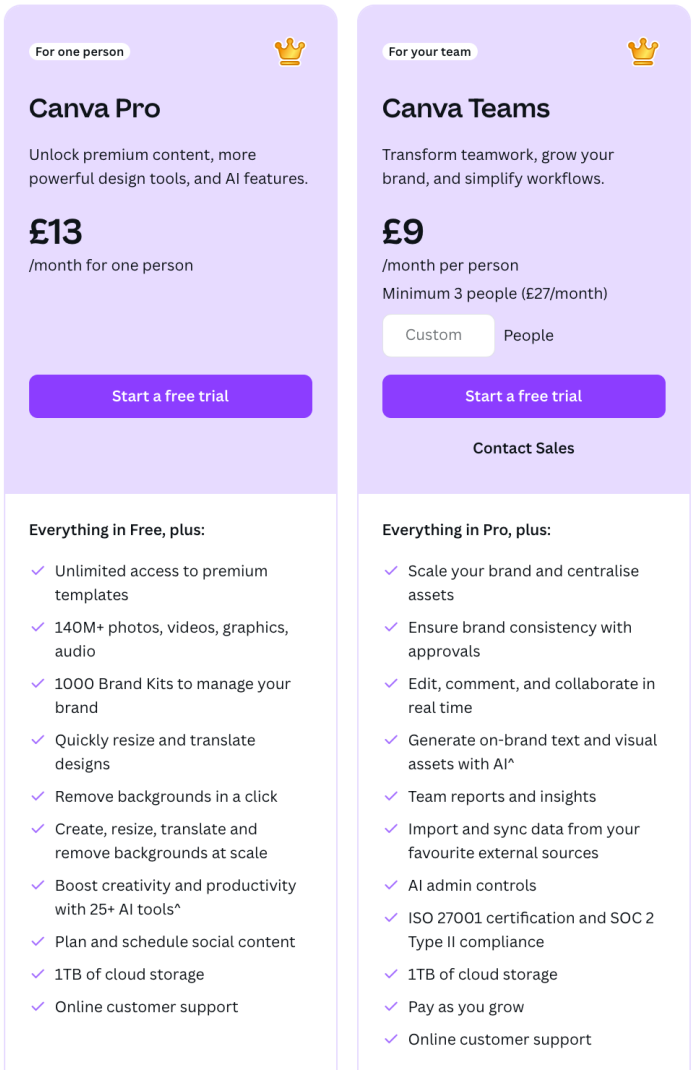
CONS:

- Offers fewer options for custom layouts, animations, and graphic design compared to Canva.
- While there are some visual options on the software → most must be uploaded or created on another platform—no built-in design tools like Canva for creating infographics or slides.

- The use of Canva and HeyGen might be necessary.

CANVA:

https://www.canva.com/



PROS

Access to a wide range of stock photos, videos, icons, and templates included in Canva Pro → can also upload your own media

Ability to upload pre-recorded audio (MP3, M4A, WAV)

- useful for AI-generated voice overs in multiple languages

You can insert a video of a person speaking alongside slides, replicating traditional Presentation-Style MOOC formats.

Every element—animation, transitions, layout—can be manually customized for a polished and branded look.

Canva AI turns text to images (Dream Lab) allows for custom illustrations.

- This element could be created and used to make images to use on other ai software.

CANVA is perfect when wanting to make specific and descriptive slides.

CONS:

- Time-Intensive Workflow because you have to manually add everything to each slide.
- Canva's script-to-video feature often generates slides with too much text, making them hard to edit and translate.
- Unlike Pictory or HeyGen, Canva does not offer AI voice narration or avatars—voice-overs must be externally created.
    - Or someone must record their own voice or video.
- Better for short to medium-length explainer videos; lacks advanced tools for long, continuous lecture videos.

May need to combine with other tools (e.g., for AI voice or animation), which can make the process tedious and costly

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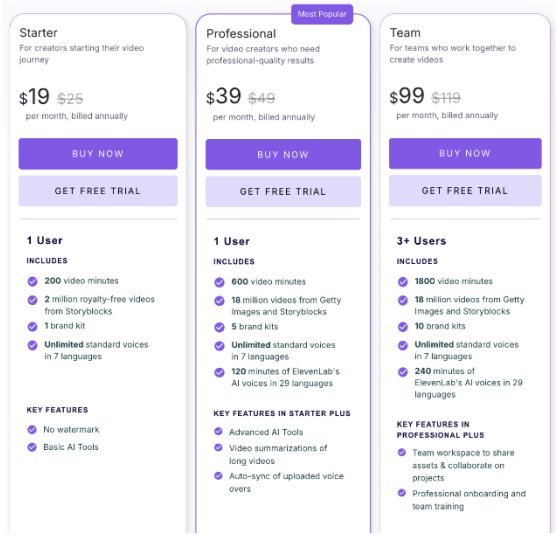
PICTORY:

https://app.pictory.ai/v2/home



PROS:

- Script-to-Video Automation
- AI Narration
- Automatic Subtitle Generation
    - Offers a variety of narrator voices with adjustable language, gender, and tone (e.g., casual, professional).
- Automatically selects relevant stock visuals to match your script content
    - Allows manual replacement of images/videos with more suitable visuals, giving some creative flexibility
- Subtitles are auto-generated and can be translated into multiple languages
- Collaboration with a team

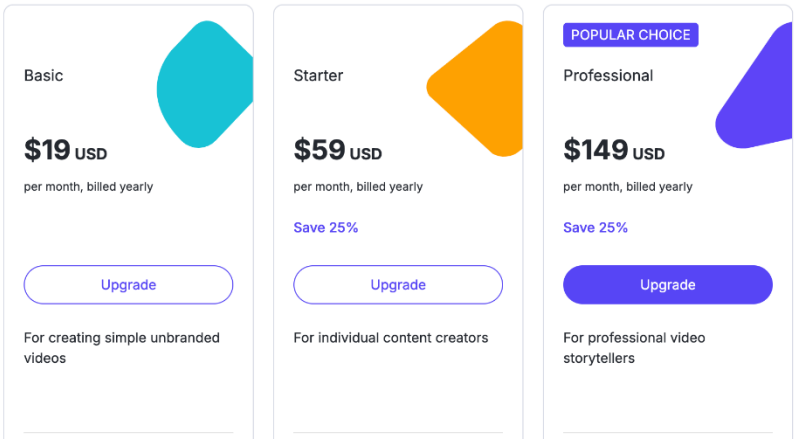
- A group of people can edit and work on the same video

CONS:

- Limited Custom Design Control
  - Lacks full creative freedom for layout, animation, fonts, branding, and detailed scene design (compared to Canva)
- Auto-selected visuals aren't always accurate; manual tweaking is often needed for relevance.

Lumen5:

https://lumen5.com/intro/?id=13966501**



PROS:

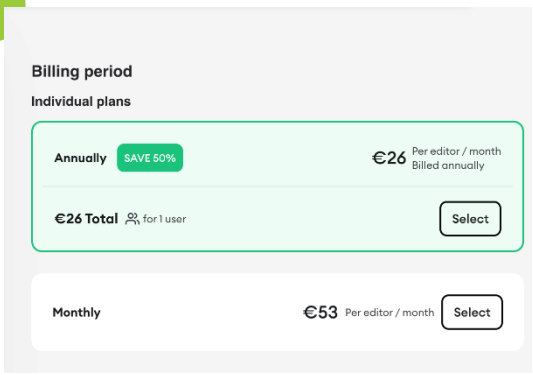
- Allows you to insert your own script to be converted into a video.
- The narration (voice-overs) as well as subtitles can be translated into other languages
- Automatically selects relevant visuals to match your script content
  - Allows manual replacement of images/videos with more suitable visuals, giving some creative flexibility
- The presentation transcribes the text directly on the video, making it easy to follow along.

CONS:

- More of a presentation format rather than visual video
- Can only use a voice over, rather than a visual narrator.
- Once again, it doesn't have the same creative flexibility as Canva.
  - Cannot directly create a slide, but rather upload one from your files (this could be created on canva)

Veed.io:

https://www.veed.io/ai



PROS:

- AI script to video and voice-over generator.
    - The Narrator's language as well as the subtitles can be translated into preferred languages.
    - Option of having an AI person narrating the script on stage or just their voice over videos.
- Additional music can be added in the back of the narration
- You can add, replace, or remove images, video clips, and graphics to match the script or visuals needed.
- Collaborative work: team editing, project sharing, and comments.

CONS:

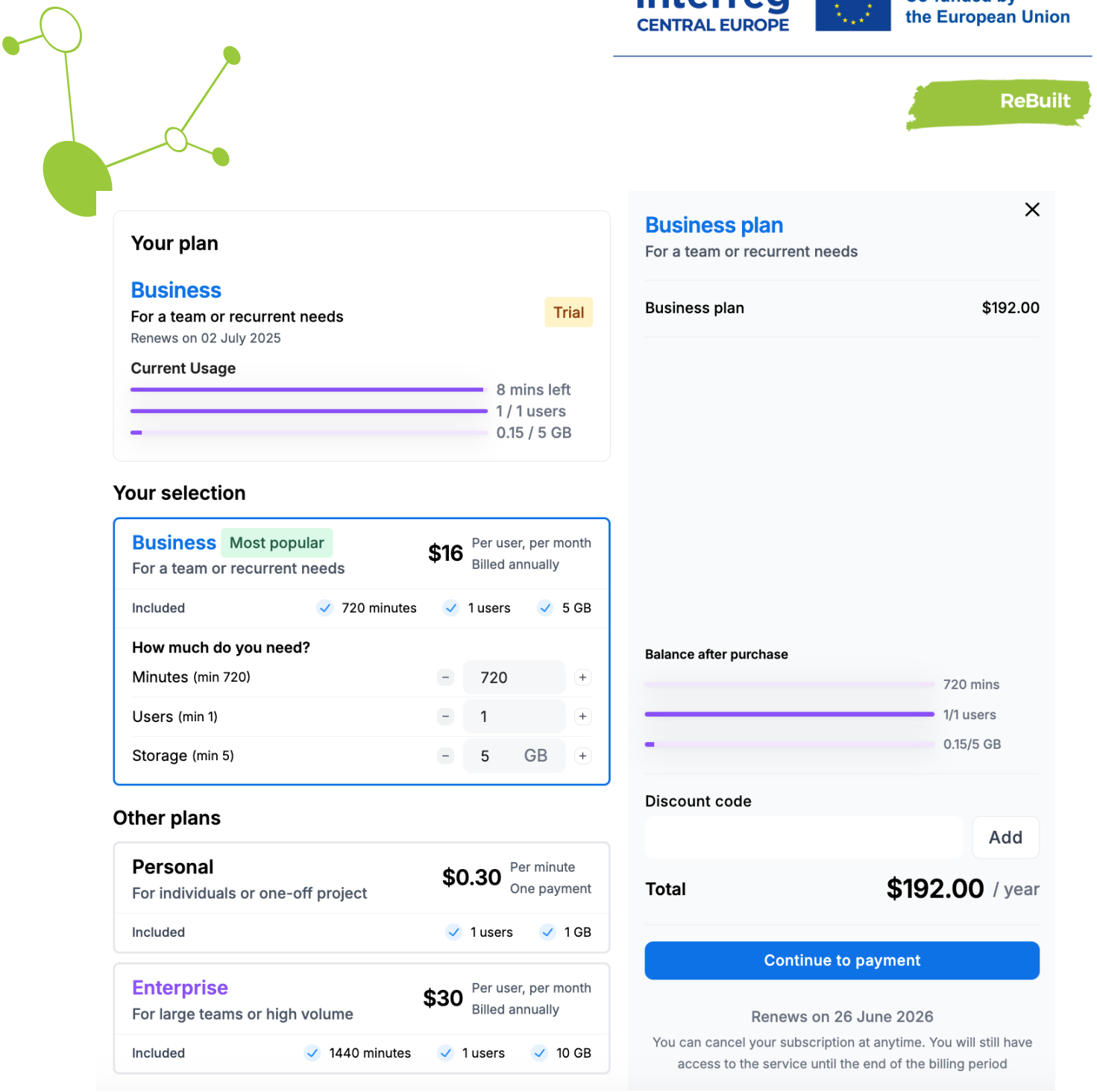
- Can't create your own graphics or images like in Canva, so there is limited creative space.
- Auto-selected visuals aren't always accurate; manual tweaking is often needed for relevance.

Tools for subtitle creations:

Subly:

https://my.getsubly.com/media/70554b84-3e4b-40a9-86f4-c63506a76e59

https://www.subly.app/#pricing



Price:

- Offers a free trial for a few minutes

PROS:

- Easily attach a video to automatically generate sub-captions from the audio.
- Captions can be translated into all of the multiple languages as needed.
- Audio is transcribed directly into time-synced sub-captions.
- Captions are embedded directly into the video or recording and can be manually edited.
    - This also allows users to create captions even without audio by typing or pasting text.
- Subtitle's visual designs can also be adjusted to different formats.

CONS:

- If there is no audio, captions must be manually written or pasted into the software.
    - The tool does not automatically generate captions based on visual presentations or slides without spoken content.
    - But it can be added manually
- Using this software would mean that multiple versions of each video would have to be created to offer different language.
    - It doesn't allow for captions to be translated by the viewer (like in Youtube Studios) —> the creator must create multiple versions of the same video in different languages

Youtube Studios:

https://studio.youtube.com/channel/UCxecjVE060p6ygitNDFRCPw

Price: Free (with a YouTube account)

- Built-in tools to automatically generate captions for videos uploaded to the platform.
- Once uploaded Youtube's AI system uses speech recognition to create english subtitles, which are automatically timed to match the spoken audio.
    - Youtube also provides an auto-translate feature that allows you to convert captions into over 100 different languages, including the ones we need.
- Captions can be edited directly with the platform.
- This is a great choice if the final product is created as a youtube video.
    - EX. Individuals can navigate the MOOC website and then be brought to youtube after pressing on each video.

CONS:

- Captions can only be auto-generated for videos with spoken audio.
    - This means scripts cannot be turned into captions on their own, and captions cannot be manually added to non-speaking videos within the tool.
- Captions are not burned into the video by default, they work as an input above the video.
    - This means that the captions are only available through YouTube
    - But this does make it easy for users to adjust the language to their own preferences without having to create replicated copies of the videos for each language.
- Speech recognition may require manual correction for accuracy, especially with accents or background noise.

Excerpt from the Terms of Use of Youtube[10]:

1. Rights you Grant

You retain all of **your ownership rights** in your Content. In short, what belongs to you stays yours. However, we do require you to grant certain rights to YouTube and other users of the Service, as described below.

2. Licence to YouTube

By providing Content to the Service, you **grant to YouTube a worldwide, non-exclusive, royalty-free, transferable, sublicensable licence to use** that Content (including to reproduce, distribute, modify, display and perform it) for the purpose of operating, promoting, and improving the Service.

3. Licence to Other Users

You also grant **each other user** of the Service **a worldwide, non-exclusive, royalty-free licence to access your Content through the Service, and to use that Content** (including to reproduce, distribute, modify, display, and perform it) only as enabled by a feature of the Service.

4. Duration of Licence

The licences granted by you continue until the Content is removed as described below. **Once removed, the licences will terminate,** except where the operation of the Service, use of Content permitted before your removal, or the law requires otherwise. For example, removal of Content by you does not require YouTube to: (a) recall Content that is being used by other users within any limited offline viewing functionality of the Service; or (b) delete copies we reasonably need to keep for legal purposes.

Right to Monetize

You **grant to YouTube the right to monetize your Content on the Service (and such monetization may include displaying ads on or within Content or charging users a fee for access).** This Agreement does not entitle you to any payments. Starting June 1, 2021, any payments you may be entitled to receive from YouTube under any other agreement between you and YouTube (including for example payments under the YouTube Partner Program, Channel memberships or Super Chat) will be treated as royalties. If required by law, Google will withhold taxes from such payments.

Removing Your Content

You may remove your Content from the Service at any time. You also have the option to make a copy of your Content before removing it. You must remove your Content if you no longer have the rights required by these terms.

Conclusion:

Using YouTube in **unlisted mode** to generate subtitles for video content does not constitute an infringement of intellectual property rights (IPR), provided that the user is the rightful owner of the content or has permission to use it. When a video is uploaded as unlisted, it is not publicly available or indexed by search engines, and can only be accessed via a direct link. YouTube's platform provides automated subtitle generation and editing tools, which can be used without transferring or forfeiting ownership rights. The content owner retains full copyright, and YouTube is granted only a limited, non-exclusive license to process and display the video within the scope of its service. Importantly, this license ends once the video is deleted. Therefore, using YouTube's subtitle generation features in unlisted mode is a lawful and efficient method for creating captions, without violating IPR.

[10] https://www.youtube.com/t/terms?hl=en&override_hl=1