



## **Artificial Intelligence and... building construction**

### **Changing Jobs... Microcredentials... First skills hiring... Certificates... and...**

#### **1 Introduction**

In this document we discuss an aspect of the 'healthy building' project that has rapidly gained interest in recent years and that will also have a major impact in the coming years on jobs in which the use of ICT and digitalization is a part of the work. This concerns the use of 'Artificial Intelligence (AI)' in all kinds of components of a function. Not so long ago it was stated that AI will cause many jobs to disappear and that the digitization of certain activities will be the cause. But it now also appears that other jobs are taking their place, so that it is also causing and will bring about a kind of shift within certain sectors of the labor market.

#### **1.1 Small programs to accommodate dynamics within jobs**

But even more interesting is that jobs are changing in all kinds of areas and that, as a result, many workers within their companies need to be retrained. This will not be always possible by offering complete and formal training. We are now looking at whether this can be done by offering targeted small programs, which can be seen as micro-credentials and for which a certificate is awarded.

In the context of our project, it is interesting whether VET Colleges and Higher Education Institutes are eligible for this. This means that it is necessary to consider whether they are already doing so or whether there may be no or very few opportunities as an education provider to provide a range of non-formal qualifications. Government-funded Colleges and HEIs in particular are not always entitled to engage in this. We will publish a document about this in a next phase of the project.

#### **1.2 Looking further into AI and Healthy Building**

In the sections about this we look at a number of issues that are currently happening as a result of the way in which AI plays a role within our society and is important for the economy, regionally, nationally and within Europe. Our aim is to provide incentives for further discussions. But the Colleges and HEIs that provide training in 'Building Construction' can also benefit from this type of information. This could also lead to a joint approach, possibly also internationally. The associated developments surrounding the consequences of the use of AI for this sector and specifically for 'healthy building' can often only be tackled in networks, with education providers, companies and other stakeholders (think of organizations that specialize in digitalization and therefore also AI).

#### **2 Task-Force VS and EU**

This document is partly based on CHAIN5's participation in activities that have been and will be organized by a so-called 'Taskforce for First Skills Hiring' (given the recruitment of people for sectors with labor shortages in the US and in Europe). As CHAIN5 we also contribute to this, partly with input from the experiences gained in our project.

Various webinars were held and participated in to see what is going on around 'First Skills Hiring'. This means that many large organizations in the US and Europe, at the invitation of the American Federal Government and the European Commission, are discussing developments in attracting people to all kinds of sectors.

The most important aspect is that the business community is able to identify the core competences of all kinds of jobs, functions and activities and that people who already work within a certain sector or are interested in a specific job can respond quickly and apply. In many cases it means that a full diploma is not required, just proof that someone has the necessary 'skills' or can quickly acquire them.

Those who qualify will in any case receive additional training. This is done by all kinds of providers of education, training and training, able to develop, offer and maintain these short programs.

Large companies are currently working on this to accommodate all of this in a well-functioning system that can be completed by employers, used by potential workers and seen as a basis for developing programs. These companies are mainly involved in digitalization, AI, software and hardware, as well as in possibilities to optimally market the link between supply and demand. In the US this concerns companies such as Cisco, Intel, Microsoft, etc. They also have their own training providers through all kinds of Business Academies. People in Europe are still a bit cautious... but it seems that more organizations will join in the coming year, partly because of this, as it were, forced by the business community. We assume that the construction sector is also interested in this, and that is why it is good to join in as project partners - if the possibilities are created for this.

### 3 AI and Healthy Building

There is an explicit connection for developments within jobs as a result of the further use of AI for the sector in which 'healthy building' plays a role. This means that it must be considered what the consequences are for the field and therefore the companies involved when it comes to the jobs and the adjustments that are needed. In line with this, providers of qualifications may have to consider the consequences for the courses if they are formally offered. The difficult thing here is always how companies know and recognize what additional training is needed, for workers through certificates and for students within educational units within a course.

Here is a (limited) list of issues that also play a role in 'healthy building' (and other topics relating to 'construction') when it comes to such training components, within all kinds of functions. This mainly has to do with the fact that a lot of use is made of digital resources and associated constructions within a home, an office, a complex or other forms where buildings are involved.

- Control of heating systems and similar systems, and therefore the use of all kinds of components, such as for climate control
- Use of solar panels
- Security of a building
- Remote use of all kinds of devices and their security
- Remote control applications (access, alarms, etc.)
- Applications for internal and external communication
- Reading readings for gas, electricity, etc.
- Use of internet, WiFi and similar facilities.

### 4 Example: research, changing skills and competences – and roles

Within the aforementioned Taskforce, an American research agency looked at the changes for certain jobs within ICT, with regard to the competencies that someone must have - and therefore must also be able to learn, as a worker or as a student within a formal education. This is an initial global exploration, but it indicates that it concerns a broad area of work.

Here is this list when it comes to a number of the jobs that will certainly change due to AI.

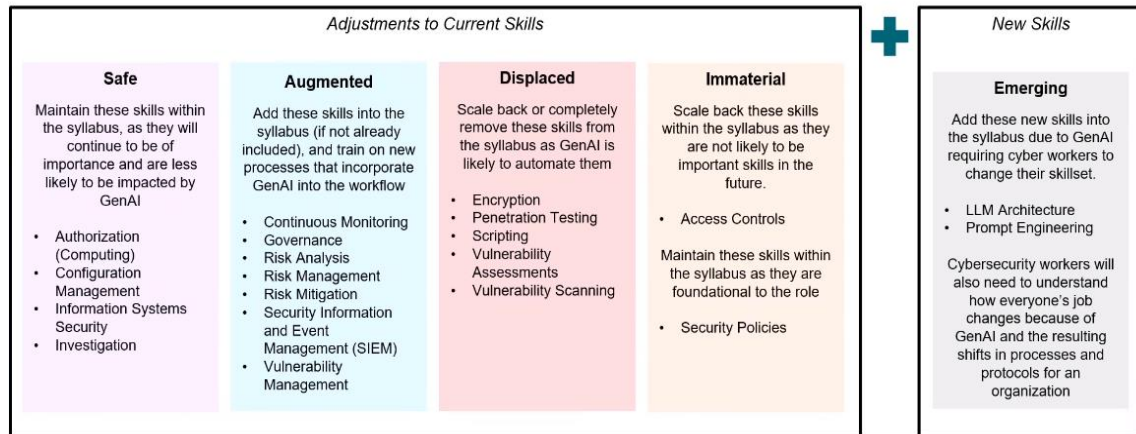
*List of Targeted ICT Job Roles (according to three organisations)*

|                            |                       |                                 |
|----------------------------|-----------------------|---------------------------------|
| CYBERSECURITY ANALYST      | SYSTEMS ADMINISTRATOR | SOFTWARE DEVELOPER              |
| NETWORK SUPPORT TECHNICIAN | IT SUPPORT            | SOFTWARE PROGRAMMER             |
| ETHICAL HACKER             | HELP DESK ANALYST     | SOFTWARE ENGINEER               |
| NETWORK ADMINISTRATOR      |                       | SOFTWARE SYSTEM ENGINEER        |
| NETWORK & IT AUTOMATION    |                       | SOFTWARE AI ENGINEER            |
| SOC ANALYST LEVEL 1        |                       | SOFTWARE ARCHITECT              |
| DATA ANALYST               |                       | SOFTWARE OS EXPERT              |
| IT SUPPORT SPECIALIST      |                       | SOFTWARE TEST AND DEBUG         |
| PYTHON DEVELOPER           |                       | PRODUCT ARCHITECT               |
|                            |                       | PRODUCT DEVELOPER               |
|                            |                       | SECURITY DEVELOPER              |
|                            |                       | ARCHITECTURE DEVELOPMENT EXPERT |

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Subsequently, one of the functions was further examined, namely being involved in 'cyber security'. Looking at this, it appears that it is also possible that, within the focus on 'healthy building', various of those components could be included in the training for this purpose.

### Cybersecurity Analyst Training



It is an interesting overview when it comes to these adjustments for carrying out certain activities. So some of these can be 'left' to be done by 'a system', so to speak.

### 5 Certificates: how to use them...

One of the aspects that are now being discussed within the TaskForce is to consider how the changes can also be implemented in formal training as quickly as possible. The importance of this is that students are not trained with all kinds of units that are then of little or no relevance to all kinds of companies. But, and this is an important point of attention, it is also true that not all companies have to immediately change everything or simply cannot or do not want to do so. The dynamics in the field can turn out differently for many companies, and therefore for the providers of formal training.

It can be considered whether the new competences (knowledge, skills) can first be offered through the short programs, for workers and additionally for alumni - perhaps by another provider, at a higher or equal level. If it subsequently turns out that these competences are generally needed within the professional field, it can be decided to structurally include units in the program.

Within our project it is interesting to recognize all of this and take it into account when it comes to the contacts between the Colleges and HEIs with the (regional) business community. If they are allowed and able to adapt programs themselves, this is a matter that needs to be tackled structurally. If the qualifications are determined regionally or nationally, it is a matter of good cooperation with the organization in question. A procedure can then be drawn up for this, if it is not already in use. But the further use of AI will certainly have to be taken into account.

### 6 QA and other issues

What is described here has to do with changes within the labor market and therefore also for 'healthy building. We list a few things in this regard and briefly indicate what it can mean for the project, its outcomes and also possible webinars that can be held.

- Jobs  
Jobs are changing and that means that training, formal and non-formal, must be adapted accordingly. But the question then is how to do this, at what pace and which other organizations are involved.
- AI  
It is necessary to conduct research into how the use of AI influences the requirements for 'healthy building', also in the formal context. Colleges and HEIs must also consider how all this should be included within the organization and the provision of training.
- Quality Assurance  
Adjustments such as those mentioned here mean that it is necessary to continuously consider how the quality of new educational units can be monitored. The design of these units can be

adjusted for all kinds of reasons, with the use of AI, online education, the use of work-based learning and the use of new materials in the workplace. If there is an external organization that assesses the quality of a training course, it must be ensured that well-founded accountability is possible.

- **Level**  
Innovations within a course, but also additions to it, can be reason to examine whether certain study units may belong at a different level. Then they can be accommodated there. But if, for example, it concerns 'moving' from 4 to 5, it may also mean that another institution has to be involved and that additional agreements are required for this.
- **Working method**  
An aspect that plays a role is to determine what the best working method is for a new educational unit. It can be done through an instruction, a project, an internship, a workplace activity, an online course, etc.
- **Teachers and instructors**  
Naturally, adjustments mean that teachers and other stakeholders (instructors, workplace supervisors and others) also have to adapt – or that new experts have to be recruited. They need to be trained, and then the question is always who is responsible for transferring the new knowledge. Especially now with AI, every educational institution will have to consider how all this will work out for education in general and teachers in particular.

## **7 So...**

What has been discussed here is the result of a study into adjustments to activities within the labor market, given the use of Artificial Intelligence in general and for functions that rely heavily on the use of digitalization in particular. The consideration of what this could mean for training courses related to our project, i.e. 'healthy building', shows that education providers need to be very alert to this point.

This document therefore provides a mainly general review, with a number of developments that deserve further attention. This can be further elaborated in a subsequent document, planned for the final part of the project.