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Käytä viittauksessa alkuperäistä lähdettä:

Heikkilä, J.; Nurmi, P. & Malve-Ahlroth, S. 2018. University-company collaboration: A platform for open data innovations in the circular economy. Ammattikasvatuksen aikakauskirja. Vsk. 20, nro 3, 54 - 58.

Pysyvä linkki rinnakkaistallenteeseen: <http://urn.fi/URN:NBN:fi:amk-201901221481>

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To cite this, use the original publication:

Heikkilä, J.; Nurmi, P. & Malve-Ahlroth, S. 2018. University-company collaboration: A platform for open data innovations in the circular economy. Ammattikasvatuksen aikakauskirja. Vsk. 20, nro 3, 54 - 58.

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University–company collaboration: A platform for open data innovations in the circular economy

Jonna Heikkilä, Piia Nurmi and Sara Malve-Ahlroth

The utilization of open data has many hidden business possibilities. Services created with open operating models may be the next success story of Finland. The utilization of open data in company-level operations is, however, still in its beginning phase. With the help of universities' innovation potential, companies can reach the next level of open data use. At the same time, students from all fields of study can gain valuable knowledge and skills related to open data by working in open data projects. Open data does not only change how future business is done but also how universities need to prepare their students for working life.

What, when, how?

Open data is data that anyone can access, use and share. Open data is a raw material for the digital age but, unlike coal, timber or diamonds, it can be used by anyone and everyone at the same time (European Data Portal 2018).

A circular economy is an economy that is restorative and regenerative by design and aims to keep products, components and materials at their highest utility and value at all times (Ellen MacArthur Foundation 2015). In the circular economy, open data has not yet been explored in great depth. As a matter of fact, in the field of circular economy the whole system of collecting data and opening it is still in the beginning stages. On the other hand, this makes circular economy a field full of potential. Many of the processes can be designed so that the open data aspect can be incorporated into a circular economy from the very beginning.

Currently, in all fields of business, most of the data information is hidden in different offices and companies, and, for example, SMEs do not have the opportunities to utilize new and challenging themes. Companies use their time to seek for information, read metadata and to adapt information received from different sources.

Strict structures must be reformed to become network-like and flexible operating models.

The key is in finding the value chains wherein producers and enablers create their business through the processing of data and, furthermore, finding companies which utilize processed data in their businesses. Growth and business potential are not actualized into new products and services without the active building of ecosystems and markets, the co-operation of different sectors, co-creation and daring experimentations. In the Open DaaS (open data as a service) project, we do exactly this – universities, together with companies, are creating an operating model for open data and digitalization utilization which can benefit regional micro companies and SMEs.

The Open DaaS project is executed with four, similarly structured work packages, which each have their own theme, and each is led by its respective university. One of the themes is the circular economy. Altogether 28 thematic pilots are organized, during which open data producers, enablers and end-users are brought together. Eight will go forward to the refinement and analyzation phase and, finally, the four with the best market potential will go forward to product or service development.

The role of universities in the development of open data use

The Open DaaS project started in September 2017 and will continue until August 2019. The project is being implemented in four Finnish universities: Turku University of Applied Sciences, Turku University, Metropolia University of Applied Sciences and South-Eastern Finland University of Applied Sciences (Xamk).

Traditionally universities have focused on teaching and research, and have operated in relative isolation from surrounding society. Although Finnish universities of applied sciences UASs have rather close relations with the industries of their fields of expertise, new ways of collaboration and co-creation are constantly needed. The success of universities in effective innovation creation is argued to be based on their ability to form partnerships and facilitate the practical innovation processes. Only when universities and society are organically linked together can the full potential of new knowledge creation can be utilized (Huhtelin & Nenonen 2015).

Like in all university–company collaboration, in the Open DaaS project, beneficial synergies are formed when the different needs and know-how of partners meet. Many companies could gain competitive advantages from the utilization of open data, but it requires knowledge and resources that they do not possess. Companies also need to stay alert for new rising technologies, as well as new talents, in order to ensure success in the long term. At the same time, universities are in need of new ideas and resources for their research. They also face pressure from society to educate skillful future experts in order to meet the needs of a demanding working life. Huhtelin and Nenonen (2015) suggest that successful collaboration between universities and companies is based on being together (as a community), using together (using laboratories, talents) and doing together (doing development, research, innovation and the co-creation of new ideas together). This is also the base upon which the Open DaaS project and its work are built.

Students from all fields of study benefit from open data knowledge

When students from different fields of study come together, they learn new skills from each other while also improving their collaboration and innovation skills. These are skills that can only be partially improved by the means of traditional teaching methods, based on lectures and individual assignments. By forcing students to challenge themselves and get out of their comfort zone through multidisciplinary and experiential learning methods, universities can help them to better develop these skills. In the Open DaaS project this is fulfilled through multidisciplinary hackathons that are organized during the project.

Hackathons can be defined as problem-focused programming events where digital innovation prototypes can be pitched, developed and presented (Briscoe and Mulligan 2014). The idea is that experts from different fields are brought together for an short, intensive period of time to work together on a certain challenge or problem. The challenges are usually set by companies or public officials.

The topics of the second Open DaaS hackathon in Turku was circular economy and the digitalization of the textile industry. This hackathon took place in March 2018 and

three companies from the Finnish textile industry presented their challenges to multidisciplinary student teams there. The teams had two weeks time to come up with newsolutions to the companies. The theme of the hackathon was clothes as a service (CaaS). It is an idea that challenges the conventional business models of the textile industry: companies would no longer sell textiles as products that can be owned, but would sell them as services that fulfill the needs of the customers without the need for ownership. This frees companies from the linear economy that is based on the endless exploitation of natural resources and helps them to transition to a circular economy where materials and energy circulate (Nurmi 2016).

While the students worked on their challenges during the hackathon, they realized how open data and digitalization revolutionize the ways in which our society works, both in the textile sector and other sectors. At the same time, they understood how those two concepts are crucial for the development of new circular economy business models. The collaboration between environmental engineering, business and IT students enabled the exchange of knowledge on both circular economy substance and technological solutions. In future hackathons, it could be the students from social or cultural sectors that bring their substance into the equation. During the two years of the Open DaaS project, dozens of hackathons will be organized around Finland in order to involve more and more students and companies in the open data innovations.

Regional innovation systems bringing universities and companies together

Open data innovations can be effectively facilitated on regional systemic levels. The concept of the regional innovation system originates from, and is much inspired by, the discussions on the national innovation system. Contrary to national systems, regional innovation systems are focused on interactions between diverse actors within the limited geographic area. The importance of the regional dimension of the innovation system has been argued to be as follows: regions differ with respect to their industrial specialization and innovation performance. Knowledge spillovers are also often spatially bounded. Also, tacit knowledge is an essential determinant of successful innovation on the regional level. Higher education and research

institutions are considered to be the primary players of the innovation system (Lyytinen 2011).

Co-creation and collaboration between universities and companies sometimes happens naturally or by accident, but more structured and facilitated systems are needed for the more effective collision of different actors. Regional innovation systems can function as such physical nodes, or social networks, that enable efficient collaboration. The Open DaaS project supports the growth of these networks in all three operating areas of the project: Turku, the Metropolitan area and South-Eastern Finland. Hopefully these regions will succeed in creating vibrant regional innovation systems that give rise to more comprehensive use of open data in all sectors.

Lessons to be learned

The Open DaaS project has revealed the importance of incorporating the open data perspective into many research, development and innovation (RDI) projects in UASs in general. It is an emerging topic that will be relevant regardless of the main topic of the project work. The overall national and international open access policies also require projects to take this theme into consideration. At the same time, the Open DaaS project has shown how it can be valuable to involve students in RDI work in order to gain knowledge about any new emerging topics and not only about open data. The role of teachers has changed from being information providers into being facilitators or enablers who help to guide the students in the right direction. It is hard for teachers to keep track of the most recent knowledge in their field of expertise, thus close cooperation with RDI projects involving various industry or research partners can help in this.

The open data topic is relevant for many fields of RDI work in UASs; therefore, it brings together experts who come from different backgrounds and fields of study. As multidisciplinary projects (like Open DaaS) are implemented more and more, all the time, it is evident that the differences in approaches can present challenges. In the future, all RDI projects will benefit from developing cooperation skills and communication between experts from different fields. When students are involved in

such, they also learn this new way of working in multidisciplinary teams. This is crucial since only individuals with such skills can be successful in the working life of tomorrow.

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Suomenkielinen tiivistelmä

Avoimen datan hyötykäytössä piilee paljon liiketoimintamahdollisuuksia. Avoimilla toimintamalleilla tuotetut palvelut voivat olla Suomen seuraava menestystarina. Avoimen datan hyödyntäminen yritysten toiminnassa on kuitenkin vielä alkutekijöissään. Tällä hetkellä suurin osa tiedosta on piilossa eri virastoissa ja yrityksissä eikä pk-yrityksillä ole mahdollisuutta hyödyntää uusia, haastavia teemoja. Korkeakoulujen ja yritysten yhteistyö tukee yrityksiä avoimen datan potentiaalin

hyödyntämisessä. Samalla eri alojen opiskelijat saavat tilaisuuden kehittää omia innovaatiokompetenssejaan sekä oppia ymmärtämään avoimen datan merkityksen tulevaisuuden työelämän kannalta. Onnistuakseen korkeakoulu-yritys yhteistyön tulee rakentua dynaamisen yhteistyön ja yhteiskehittämisen menetelmien pohjalta. Tällaisia yhteistyöverkostoja rakennetaan kaksivuotisessa Open DaaS -hankkeessa, jossa neljä suomalaista korkeakoulua valjastavat innovaatiopotentialinsa paikallisten yritysten käyttöön monialaisten hackathonien muodossa.

Avainsanat

kiertotalous, yritys yhteistyö, digitalisaatio, yhteiskehittäminen

circular economy, university-company collaboration, digitalization, co-creation

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