

GAP ANALYSIS, UPPER AUSTRIA

Deliverable D.T2.2.4

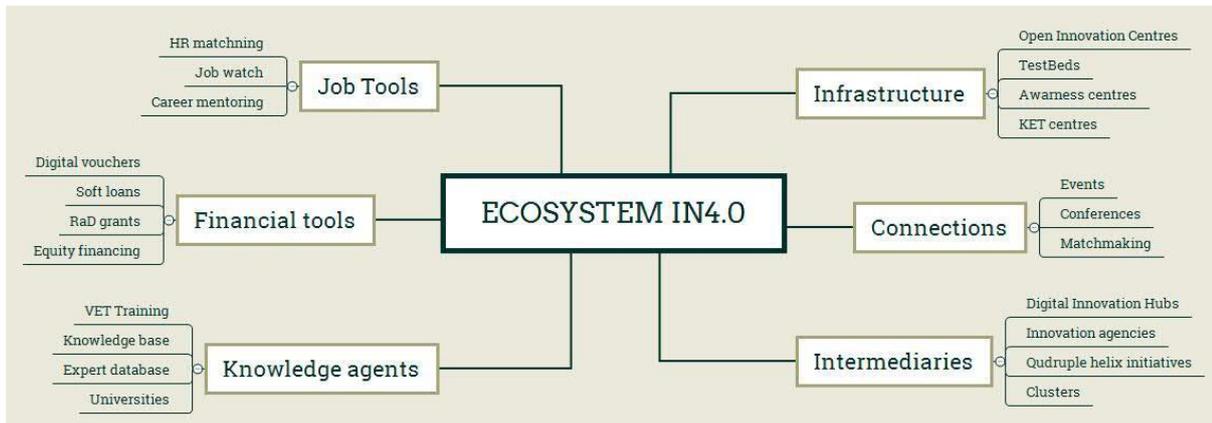
Version 1





Each partner has prepared regional SWOT analysis, deliverable T.2.2.1.

Gap analysis continues the SWOT analysis, involves the comparison of actual ecosystem performance (described in WPT1 and in SWOT) with potential or desired ecosystem structure/performance described in WPT2. It will be text document evaluating current ecosystem and show directions for improvement.



Structure of deliverable for each partner:

1. Performance of ecosystem

Infrastructure

Upper Austria as an economically strong industrial region has a strong infrastructure with good performance. The infrastructure consists of many successful and innovative industrial enterprises on the one side, on the other side – due to the influence of the ever-growing industrial environment – over the years, many scientific institutions have developed, e.g. the Johannes Kepler University (JKU) and the Upper Austrian University of Applied Sciences. Specifically, in the Industry 4.0 infrastructure context there are institutions such as the Open Innovation Center and the Industry 4.0 pilot factory at the JKU, competence centres such as the Linz Center of Mechatronics and the Excellence Center for Smart Production at the Upper Austrian University of Applied Sciences, as well as research institutions such as Profactor and Pro2Future among others. These components are well connected and work together on different levels. The weakness of the component’s ecosystem lies in decentralisation and heterogeneous ownership structures in Upper Austria, which leads to the absence of a uniform, superordinate strategy which would allow the best possible, synergetic use of the existing infrastructure. Another consequence of having no overarching strategy is the lack of prominence of Upper Austria’s existing infrastructure in the international context.

Connections

Upper Austria’s I4.0 ecosystem is well established, mainly through its vibrant and successful Cluster initiatives (Automotive Cluster, Cleantech Cluster, IT Cluster, Plastics Cluster, Mechatronics Cluster, Medical Technology Cluster, Furniture & Timber Construction Cluster, Upper Austrian Food Cluster), of which the Mechatronics and IT Cluster play a crucial role in connecting the I4.0 and digitization ecosystem in the region. A large and proved portfolio is provided by the clusters, both for awareness building and professionalization. Examples are round tables for exchange of experience, conferences, supplier innovation days, workshops and trainings. The aim of those formats is the know-how transfer throughout the region, and also the enforcement of collaboration between companies.



Besides the Cluster Initiatives, which are part of Upper Austria's business agency Business Upper Austria, other actors like universities, research institutions or the Chamber of Commerce e.g. launch initiatives for connecting stakeholders in I4.0 and digitization. It can be concluded, that the Upper Austrian ecosystem is well connected, mainly through the broad and well-established Cluster networks as well as other actors. The weak point, considering the connections within the ecosystem, is the lack of coordination between the various providers, which makes it hard for customers (company representatives) to keep on track with the various offers.

Intermediaries

Upper Austria has a broad landscape of intermediaries which leads to a closely interlinked innovation network. An essential role is played by the various cluster initiatives, whose positive and huge effect can be underlaid by numbers from the Regional Innovation Scoreboard (RIS) which shows, that 68 % of Upper Austrian companies have had cooperation agreements in innovation activities with other enterprises or institutions or developed a new product or process in-house or with other first 2019, which can be accredited to a big part to the work of the Upper Austrian Cluster initiatives. Their goal is to convince companies and research institutions in industry sectors to jointly tackle new challenges and projects and increasingly try to support cross sector networking beyond the cluster boundaries. Also, tech-transfer-methods like Open Seminars, Working Tables, B2B-Matching etc. are operated as daily business within the Upper Austrian Clusters.

A minor intermediary role, compared to the clusters, is also played by the Chamber of Commerce of Upper Austria, where Upper Austrian companies are part of through compulsory membership fee. But the Chamber of Commerce is shareholder of Business Upper Austria and supports the clusters' work.

There is no Digital Innovation Hub as defined by the European Commission in Upper Austria, but Upper Austria is involved in 9 COMET-Centres (from total 22 Centres all over Austria), of which 5 are located in Upper Austria (e.g. Symbiotic Mechatronics at the Linz Center of Mechatronics-LCM, Pro2Future). The national programme COMET (Competence Center for Excellent Technologies) was launched in 2006. The competence centres programmes are internationally recognized as best-practice model and have been among the most successful technology policy initiatives in Austria.

Although many Upper Austrian intermediaries are involved in EU-level projects or platforms such as the Vanguard initiative, there is no strategic and coordinated sustainable use, as the intermediaries mostly have a regional or national focus. Networking at international level can be considered as minor weakness in this context.

Knowledge agents

In the context of Industry 4.0 Upper Austria has competence at the Johannes Kepler University, the Upper Austrian University of Applied Sciences and various research institutions, which altogether act as knowledge agents. Based on the fact that Upper Austria has a strong industrial economy, there is also a huge availability of technical knowledge directly from the companies, a strong expert database can be accessed through the cluster initiatives. The knowledge agents cooperate with each other on a good basis, with mainly large companies taking up the offers. In conclusion, the ecosystems of knowledge agents can be described as good. If there is a weakness to mention, it would be the position of the Upper Austrian universities and universities of applied sciences in the international field. A lack of recognition can be found, as the institutions are not really able to set trends and take the lead on front-end issues. Due to this, they can only to be found in the middle of international rankings. Consequently, international significance is only partially fulfilled.



HR tools

Upper Austria has a very diverse landscape when it comes to qualification in branches connected to and dominated by I4.0 and digitization. In higher education, the University of Applied Sciences and the Johannes Kepler University offer a wide range of studies in topics like Mechatronics, Mechanical Engineering, Automation Engineering, IT etc. In addition to these scientific institutions, there are many other providers who offer a wide range of training formats. One of Austria's success factors, which is also very acknowledged internationally, are the higher technical colleges and the entire apprenticeship system (dual education). The absolvents of these types of schools often form the backbone of domestic companies, especially SME's.

In addition, qualification is offered also by many of the stakeholders mentioned in "Infrastructure". The clusters for example offer qualifications in many areas of the topic, ranging from short workshop format classes to long-term qualification programmes.

The increased demand on specialised staff which comes with the lack of skilled workers who can cope with the challenges of an increasingly digitalized industry is a relevant topic in Upper Austria as in many other European countries. The region is trying to raise awareness of young people for technical education by launching different initiatives (e.g. IT rocks), and also by initiatives which help foreign skilled workers with settling in Upper Austria.

Financial tools

The Austrian and the Upper Austrian funding system in particular have to be described as very broad and good in comparison to the funding systems of other countries. It is used intensively by scientific institutions, companies and other stakeholders. The monetary resources provided by the public sector are relatively large. The spectrum of funding is very diverse – from specific long-term programmes such as the funding of innovative cooperation projects through the cluster initiatives to topic-specific calls for proposals derived from the various strategic programmes such as #upperVISION2030. #upperVISION2030 is Upper Austria's new business and research strategy, starting with 2020. It has a huge focus in the priority of "Digital" Transformation – calls and measures have yet to be defined resp. brought to action. It can be concluded that Upper Austria has an excellent funding system for the means of Industry 4.0 and Digitization. On the other side, there is a lack of risk capital and venture capital in comparison to other regions and countries.

2. Necessary developments in the region

Upper Austria's business and research strategy #upperVISION2030 gives a clear view of the objectives the region should fulfil in the upcoming years. As the economic and social benefits of the digital transformation have been successfully implemented in Upper Austria's business and industry, now the main focus should be on people. By 2030 Upper Austria will be a dynamic and cosmopolitan model region for digital humanism – an era that is now emerging as a result of the cooperation between all political, economic and scientific forces. Artificial intelligence and robotics will be implemented in all areas of life in 2030 wherever they are needed. The underlying technologies have been made comprehensible to the general public leading to a high level of acceptance in daily use.

The objectives in the field of Digital Transformation, but also in the priorities "Efficient and sustainable industry and manufacturing" and "Systems and technologies for people" are:



- Use data to generate knowledge and create value by raising the innovation potential of new technologies, such as Big Data, Artificial Intelligence etc. in priority areas of action and transferring new technologies into applications
- Achieve a pioneering position in the field of human-centred AI and set quality standards in the classification of AI systems in terms of security and reliability in the way they are used
- Maintain and expand the technological lead of companies in the region in order to continue to successfully place innovative products and services on national and international markets
- Position Upper Austria as an international competence region for applications at the human/machine interface, especially in the fields of automation and robotics

Upper Austria's business and research strategy #upperVISION2030 is integrated into the location partners' strategic objectives. Location partners are stakeholders working together to be a leading innovative region. Many of them are also part of the I4.0 ecosystem of Upper Austria, e.g. Chamber of Commerce Upper Austria, Upper Austrian Council for Research and Technology, Upper Austrian Research Ltd., Business Upper Austria, Johannes Kepler University, University of Applied Sciences, National Platform Industry 4.0 etc. A major contribution of the location partners is to see the region as a whole and actively shape the strategy process. The interaction of the individual protagonists ensures close coordination with corresponding strategies. Each location partner has the freedom to act, nevertheless coordinated measures and the use of synergies in the central fields of action are essential for the successful implementation of the strategy and the fulfilling of above-mentioned objectives.

According to the strategic programme, following are the main challenges for Upper Austria in context of I4.0:

- Digitization of all areas of life
- Demographic development with effects on the skilled workforce situation
- Sustainable industry & production
- Structural change in the automotive industry

In context with the ECOS4IN SWOT Analysis, following topics could be suitable for further development in Upper Austria:

- Transfer of scientific results into SME
When it comes to the specific problems of the I4.0 ecosystem, one of the main points is the accessibility of I4.0 infrastructure for SMEs and by that the ensuring of the knowledge transfer. Many of Upper Austria's scientific institutions have excellent competences in the context of I4.0, but their cooperation often is limited exclusively to cooperation with large companies. This is critical insofar as around 80 % of the companies in Upper Austria are SME. The institutions often address a very excellent, well informed and already innovating target group, but does not make the topics understandable for small and medium-sized companies, which consequently cannot bring the scientific knowledge into application. The transfer of scientific results to SME's, trade and crafts has surely to be addressed in further development, as it represents a great opportunity and high potential.



- Practical and application-oriented formats
It is obvious that companies must be given the opportunity to try out and test I4.0 technologies. This lowers barriers beforehand, especially for SMEs, and increase openness to new technologies. Examples are robotic workshops, AI user seminars, factory visits, Open Labs, etc.
- Networking on a global level as opportunity
Networking on international level in the context of I4.0 should be stronger in Upper Austria. Based on existing regional and national structures, networking with similar platforms on I4.0/Advanced manufacturing can be an innovation boost to the whole region. This should not be limited to Europe alone, but should expand to relevant international hotspots and should be used by representatives of the Triple Helix from business, science and intermediaries in a coordinated way.
- Excellence through specialisation
In order to be a trendsetter in various I4.0 areas in terms of content, a consistent focus on key topics is required. This could also mean that topics are no longer dealt with by every institution.
- Consideration of I4.0 aspects in all training areas and sectors
Many opportunities can be found in the renewal and adaption of the content of training plans and the overall consideration of I4.0 aspects. This also may require investment in infrastructure. I4.0 know-how must not be restricted to classical technical oriented professions, but expanded through all training areas and sectors.

3. What will be nice to have in ecosystem in our region (for example specific Open Innovation centre, testbed)

Due to the fact that Upper Austria has a large number of facilities, institutes and initiatives in the field of I4.0 and possesses corresponding competencies in terms of content, a future ecosystem should above all have an overarching strategy with a clear commitment to overarching cooperation and thematic focus. This is not primarily concerned with the further development of new infrastructure, but rather with closer networking between all players in Upper Austria in order to achieve a corresponding global visibility. In this respect, digital innovation hubs could be a good opportunity to act in a coordinated manner at the virtual level and create a point of contact for all companies in the region. At present, there are some considerations concerning the establishment of DIH on specific topics, but in future such a DIH should ensure the achievement of objectives at a strategic level.

4. With whom specific ecosystem components we will share resources with another regions (on national level or on cross board level).

Currently, Upper Austrian stakeholders share and gathers I4.0 knowledge mostly through European projects, with direct neighbours through Interreg AT-CZ and Interreg BAY-AT and with other regions through Interreg Central Europe, Danube Transnational, Alpine Space, Europe and Horizon 2020 among others, where many projects tackle I4.0 topics.

Upper Austria is also part of the European Region Danube-Vltava, together with the Bavarian districts Upper Palatinate and Lower Bavaria, the Czech Regions South Bohemia, Pilsen Region and Vysocina Region and Lower Austria. Among other topics, the European Region Danube-Vltava is engaged in the topic of Industry 4.0 qualification.



Since 2005, the International Forum of Mechatronics takes place yearly. The venue rotates between Germany, Austria, Swiss and Italia. The partners are several cluster initiatives of the mentioned countries. The forum constitutes a European marketplace for technological presentation and discussion of research and development results from science and business, for the initiation of new partnerships and for the increase of innovation dynamics in the participating economy areas.