AI Social Design Thinking Lab
ATCZ271 - AI SDT-LAB

T1.1.4 - All Partners' Comparison Report on Barriers, Needs, Competences and problem Scenarios regarding AI implementation

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Content

1 Barriers

This section outlines the barriers identified during the analysis of secondary sources (T1.1.1) and analysis of expert interviews (T1.1.3) of Upper Austria, Vienna and Southern Bohemia. The barriers identified are the most critical obstacles to the successful introduction of AI applications in sales and marketing. The important matters identified are summed up according to similarities and differences amongst partners which arose from the analysis, those being:

1.1 Similar barriers amongst project partners

Amongst the similar barriers identified amongst all project partners we can recall the following:

- **Trust:** Barriers regarding trust in AI technology came up in each partner context. Trust in AI can and does mean a variety of things, however the general issue is that to make the most out of AI, technical and social trust must be established within organisations, as well as amongst business, AI stakeholders, and the general public at large. All case partners mentioned some aspect of organisational and cultural bias against AI technology due to a lack of trust in the value proposition of AI. For example, organisational bias against AI implementation occurs due to mistrust in data sources, the gathering data process, and managing the large amount of data. Another example of one of the potential barriers is the low traceability of AI systems, which not only diminishes trust in their use, but can also lead to legal consequences if companies fail to manage their data properly. In Upper Austria, the establishment of trust is linked to tangible outcomes and performances. One example of a barrier to value-based trust from expert interviews was in-between solutions for customer relationship management (CRM) software, which result in companies losing resources in manual processes instead of investing time in strategic or analytical tasks (IP 1, 2 and 6).
- **Knowledge barrier:** For each partner, knowledge barriers are significant hinderances when it comes to AI adoption. Expert interviews from Vienna describe how companies

not only lack the "know-how" (IP3) for a successful AI implementation, but also the knowledge about AI technology, which AI solutions are available on the market and what they can or cannot do. For Upper Austria, there are other knowledge gaps such as many companies not being aware that for AI technologies, a company must generate data and train their own models. In South Bohemia, this was more specifically in reference to issues of knowledge transfer and talent leak, as technical experts trained domestically enter into the private sector or move abroad for employment and thus the benefits of suck skills and knowledge are not realized within the region.

- **Lack of proper infrastructure:** Partners identified a lack of internal infrastructure within organisations and external infrastructure on the level of national and regional R&D policy. Internally, these mostly relate to a lack of knowledge (see section Knowledge Barrier) and processes for training both employees and data streams. In South Bohemian, few educational institutions provide adequate education in the AI field and lack sufficient equipment. There is a lack of economic and programmatic support in the form of knowledge centers, as well as a lack of knowledge transfer infrastructure between research institutes who specialize in knowledge production and SMEs. Another barrier related to infrastructure was described as a lack of intellectual property protection due to poor AI legislation.

- **Resources:** While it can be argued that resources are one aspect of infrastructure (e.g. data as a resource and a part of infrastructure), the resource barrier across the countries can be painted more broadly. In Upper Austria, the carbon footprint of running AI programs was mentioned as a fundamental requirement, much like financial resources, and thus education and research can only go so far without the resources and funding to implement AI on the shop floor level. In South Bohemian, the resource barrier relates to limited access to funding and/or investors for innovative business plans (Strategy of the South Bohemian region 2021-2027, 2021) and which might relate to a major part of state subsidies giving favor to the other Czech regions. Furthermore, all partners identified a need for change management and leadership as an additional human resource need for AI implementation.

- **Will to innovate:** All case countries expressed a need for AI implementation to be an intrinsic willingness. In both Vienna and Upper Austria, the will to innovate was presented as a managerial barrier and task, whereas in South Bohemia, the 'will to innovate' barrier was described as an inflexible workforce and an impossibility of changing old habits or learning a new approach (JVTP 3_D). Generally, these findings suggest that the 'will to innovate' is barrier that must be addressed through some change processes in order to implement AI.

1.2 Different barriers amongst project partners

Following the similarities in barriers amongst project partners, below sums up the main difference found between partners, being:

- **Trust and open discourse:** While trust issues were more technically driven in Upper Austria, in Vienna, issues about trust don't refer to technical trust in traceability and sourcing of data, but to opening the debate about AI such that critical voices are also present. While in Bohemia, issues of AI as a "black-box" relate to a barrier create by lack of awareness, as SMEs are often not even aware of potential benefits that digital transformation could provide.

2 Needs

Following our comparison of barriers across case countries which hinder AI implementation (see previous section 1. Barriers), the next step is to compare the needs to better support the adoption and implementation of AI in SMEs. In many cases, the needs can be closely traced from the barriers, specifically needs regarding 1) development of trust 2) knowledge transfer 3) coordination and planning (vis-à-vis infrastructure development) and 4) more resources to support innovativeness. The needs also reflected the similarities and differences in case countries' handling of these barriers.

2.1 Similar needs amongst project partners

- **A common framework:** uniform legal and technical framework for EU companies. Such a framework should include ethics and a moral framework, binding rules and prohibitions, expectations for transparency, and respect for fundamental rights. A common framework would also support a shared understanding amongst AI stakeholders regarding the megatrends and the skills needed to be prepared for the future of AI. It is also a shared need across cases for framework conditions which are business friendly and thus support innovation within firms. In South-Bohemia, for example, there is an explicit need for the regional strategies to be more responsive to the National Strategy for Artificial Intelligence in the Czech Republic (2009).

- **Knowledge and skills development:** More interdisciplinary knowledge and knowledge centers to inform and guide decision making processes, stakeholder engagement in research and development, AI first tools, and proof of success. For all case contexts, creativity, innovation, collaborative skills and new qualifications were mentioned as skills-based needs. Another important skill is leadership development according to the new demands AI brings with it. Managers need to develop proper communication skills. Learning can be supported various innovation programs such as sandboxes and testbeds for prototyping applications. All case partners reflected a need for stronger learning and educational programs with clear commitment to gaining AI competence. In South-Bohemia, knowledge and skills development needs relate more specifically to the issue of investment in talent in training, which is substantially funded by foreign-controlled enterprises (over one third) with only one fifth going to private domestic enterprises.

- **Coordination and planning:** One significant theme across partners was the need for coordination and planning. Silos amongst teams must be broken down to successfully implement AI, because AI applications often operate across functions or at the very least, can create problems if the cross functionality of data and teams is not considered. For example, this can mean merging IT and marketing teams, IT and business strategy, preparing cross functional teams for both incremental implementation and implementation at scale during the implementation of an AI. In Vienna, it was noted that coordination and

proper planning were also important factors in trust building within companies. At the company level, coordination and planning should be more agile, which experts described in their interviews as one method whereby AI integration is seen as supportive rather than additional work. For managers it is important to not set too high expectations to AI technologies (IP1) and that poor technology integration can be better supported by hiring contact persons and AI managers (IP2 & IP6).

- **Improved knowledge transfer:** Due to the limited time and resources typical of most SMEs, better utilization of research institutions and cooperative partnerships with firms and municipalities would greatly support technology and knowledge adoption. Such knowledge transfer mechanisms can also be used, more concretely, to develop appropriate infrastructure or data, or to create barrier-free exchange of knowledge to instruct businesses and the wider public about AI.

2.2 Different needs amongst project partners

Following the similarities in needs amongst project partners, below sums up the main difference found between partners, being:

- **Support schemes:** In both, Vienna and South-Bohemia, support schemes provide experimental spaces for business development around AI implementation. However, their uptake and utilization vary across the different regions. In Vienna, for example, such 'sandbox' spaces have been crucial for prototyping and testing different use cases of AI. Alternatively, in South-Bohemia, programs such as the Smart Accelerator project are coordinated at the regional level and include a variety of business development and digital transformation programs, however, there has been low utilization of these efforts (RIS3 Strategy of the South Bohemian Region 2021-2027). This is mostly attributed to the high amount of personal and managerial stress brought on by the COVID pandemic, which leaves less capacity within businesses to take on challenges such as AI adoption.

3 Competences

When it comes to analyzing competences which are needed to succeed in any AI implementation, all project partners have highlighted both existing and expected competences within the regions. Some of the highlighted competences are perceived to be important by every partner (see chapter: similar competences) and some are not (see chapter: different competences). Below, we have compiled a comprehensive list thereof.

3.1 Similar competences amongst project partners

During the analysis of secondary sources (T1.1.1) and with the knowledge gained from the expert interviews' outcome (T1.1.3), we have been able to sum up the most important common competences:

- **The growing role of AI-driven knowledge centers** and the identification of those knowledge centers as *"active players"* to promote and foster the acceptance of AI by providing a good degree of information and guidance within the partner regions. The region of *Upper Austria* boasts a remarkable university and applied sciences institutes' network which is moving towards the divulgence of AI, thanks to dedicated projects and ad-hoc curriculum. Some of the existing centers of excellence include: AI Upper Austria, the Software Competence Center Hagenberg, LIT Artificial Intelligence Lab, the Johannes Kepler University Linz (JKU), the TÜV Austria and the University of Applied Sciences campus Steyr with two research projects entirely dedicated to AI and with the intention to include AI in the future study programs. Vienna's most prominent research centers are specializing in expanding the topic of Trustworthy AI with RRI (Responsible Research Innovation) centers such as the Johanneum Research, Centre for Social Innovation, Ludwig Boltzmann Gesellschaft, the Austrian Agency for Research Integrity and the Austrian Institute for Technology, the research group Science Technology and Social Transformation of the Institute for Advanced Studies in Vienna. As well as this, the Security Hub Vienna makes sure that topics like trust and Trustworthy AI are part of the discourse while helping Start-ups and SMEs venturing in AI projects.

- **The AI-driven organization landscape:** *Upper Austria* can be proud of hosting some of successful and world-renown AI-driven businesses within its territory. In *Vienna* Start-ups and SMEs would highly benefit from AI, too (see Summary of T1.1.1 & T1.1.3 – chapter 4.2.1). In *South Bohemia*, there is a growing sensitivity towards digital-driven projects. The center of gravity lies in the establishment of a digital regional data platform, particularly geoinformation systems and internet of things infrastructure. Another significant aspect of digitization is spreading Open Data resources.

- **The importance of influencing policy makers and governments** to address those stakeholders who can influence the AI landscape in terms of trust and compliance. In *Vienna*, the funding programme of the Austria Wirtschaftsservice Gesellschaft (AWS), for example, creates investment incentives for Austrian companies (see Summary of T1.1.1 & T1.1.3 – chapter 3.2.3). For what concerns *South Bohemia*, the basic motivation is the realization of EU cohesion policy interventions in the field of research, development, and innovation. The region's RIS3 strategy is to build functional partnerships at the regional level between the local business community and public research institutions (MPO, 2021c). For this, the establishment of a research infrastructure is an essential element. Following the project Smart Factories in new EU Member States of the European Commission with implementing a network of Digital Innovation Hubs (DIH) (PwC Polska Sp. zoo., 2017) the strong competencies are connections with investors, facilitate access to financing digital transformations, encourage synergies of AI and other technologies. Further connect competences centers (universities and technology centers), enhance incubators and accelerators to help start-ups and mentoring the vision, aims and scopes in process of business model development.

3.2 Different competences amongst project partners

During the analysis of secondary sources (T1.1.1) with the knowledge of the expert interviews' outcome (T1.1.3), we are eager to sum up those differences amongst partners which arise after the analysis of both documents, those being:

- **Knowledge Gap:** South Bohemia have specifically highlighted the lack of AI-specific competences within the region; with knowledge here intended as a combination of both support and professional training. Solving the knowledge gap will help companies understand the value of AI and fully grasp the benefits of it.

4 Problem Scenarios

Problem scenarios have been drawn by each partner as to signify the possible scenarios where AI's power could be harnessed. The results have identified the following similarities and differences.

4.1 Similar problem scenarios amongst project partners

Some of the similar project scenarios identified by all project partners include

- **The fundamental role of local stakeholders to remove entry barriers to AI:** This is a problem scenario which has been confirmed for SMEs, export companies, Start-ups, and production-driven companies, hence common to all project partners. Amongst every project partner there is a shared idea that some of the afore-mentioned research institutions, in synergy with policymakers and influential personalities, can and should foster the spread of AI in the right direction for corporations that are willing to kickstart the digital revolution in an ethical. All project partners, both within the study of secondary sources (T1.1.1) and within the analysis of the expert interviews (T1.1.3), have made it clear that AI is expected to be a disruptive project for any corporation, and that the help of external forces – be it the role of a university or institutes like the Chamber of Commerce – is fundamental to the kickstart of AI projects and the longevity of them as well.

- **AI which proposes trust and a human-centered approach to problem solving and customer experience:** All project partners have identified the importance of conveying trust and a safe environment within the scope of the AI projects set up within any corporation. A lack of quality data and certifications (see Summary of T1.1.1 & T1.1.3 –

chapter 1.2.4) can hinder the level of trust towards AI within a corporation; nevertheless, the quality of the possessed data are much more important than the importance of trust issues as this is considered as the basis of the discourse when it comes to setting up AI in any company (IP 5).

- **Change management:** All partners have identified a common problem scenario in the necessity for a company to be agile and be able to welcome the new technology with a fresh mindset. Leaders need to possess change management skills and to be flexible and open to shift priority to AI (see Summary of T1.1.1 & T1.1.3 – chapter 2.2.4; IP3; IP4; IP6). The importance of training (3.3.3) for the workforce to be competitive is also one of the drivers for a successful implementation.

4.2 Different problem scenarios amongst project partners

One problem scenario described by the partners was particularly different from the others was the following:

- **Increase of AI knowledge for sales and marketing driven corporations:** This problem scenario is specific to the region of Upper Austria where the number of export companies focused on marketing and sales is abundant (see Summary of T1.1.1 & T1.1.3 – chapter 4.1.3). In this context, adopting AI requires a convergence of different aspects. A strategic framework involving a mixture of good interpersonal skills which welcome technological change proactively as well as AI skills including proper data and management knowledge coupled with proper knowledge of systems and procedures. This will be the basis for enacting the change management which is needed to accept AI and exploit all its technological benefits.