DATEurope
Digital Assistive Technology
Industry Association

Addressing the Gap

Building links between the assistive technology research community and the AT industry

A DATEurope Discussion Paper

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Introduction

At the ICCHP/AAATE inclusion Forum in July 2022, DATEurope, The European Digital Assistive Technology Association, held a roundtable to discuss and open debate to understand how researchers and industry in the field of assistive technologies could work more closely to facilitate innovation and more effective access to AT. The discussion was led by an invited roundtable, who were encouraged to openly discuss relevant thoughts, opinions, and experiences. Representatives of Academia, Incubation Centres, Disabled Persons' Organisations and both the AT and broader technology industry participated with additional insight and contributions from the audience.

This paper seeks to summarise the ideas and opinions shared during the workshop. We aim to provide a framework for further discussion and shared action. Such dialogue aims to promote the implementation of innovation in assistive and accessible technologies for the benefit of people with a disability.

Background

DATEurope facilitated the workshop following a survey of members, where the need to encourage and stimulate innovation was highlighted. Members recognised that high-quality research into accessible digital technologies was increasing in universities and was reflected in the WIPO report into trends in assistive technology as evidenced by patents. Members sought to understand the relationship between the research and the ability to bring products to market to serve those who

needed them. How this relationship could be nurtured for the benefit of persons with a disability and the mutual benefit of both researchers and entrepreneurs required further investigation.

Bouchard et al. (2018) Identified a series of factors that impacted the transfer of innovation from research institute to industry. These included: -

- The unprecedented and very intricate interdisciplinary challenge of the questions to be researched.
- The necessity of designing and developing the technology from A to Z by including the users and the professionals at each step of the development process.
- The need for substantial infrastructure and equipment requirements for adequate prototyping.
- The challenge research teams face in establishing solid partnerships with public organisations to carry out experiments that demonstrate the effectiveness of the proposed technological solutions.
- The lack of relations with the private sector and the stakeholders to ensure a fluid technological transfer and systems that meet the need of the market (e.g. robustness, cost, etc.)

In this review, we focus on the last of these factors while recognising the wider challenges suggested.

Bouchard et al. continue, stating that in much research into assistive technologies, the exploitation phase of the research is often misunderstood and/or neglected by academic researchers (Pinard et al. 2016). Most researchers provide results in the form of Intellectual Properties (IP). They may not even be motivated by moving to the creation of a viable prototype such as an algorithm, code, software, or device, and many researchers are not aware of how to handle their IP from that point. IP must be properly protected and must evolve from the research. IP needs to have a clear value for companies, with a pathway to the design of a concrete product, which would have greater intrinsic value for businesses, including the potential limitations and permissions granted with an open licence. A significant challenge can be determining the ownership of IP derived from research which may sit with the institute rather than the individual researcher.

At this stage, the work with industry partners is critical, but industry representatives should be involved in each phase. , The industry partner should take the leading role in the planning and delivery of any exploitation process, seeking to transform IP into usable products and to seize market opportunities.

With these thoughts in mind, the open discussion on the transfer of innovation took place at the conference in Lecco.

Key issues

Within the discussion forum, a series of issues began to emerge that impacted the successful relationship between the researcher and the industry. These included: -

1. Latency and Lag

The timescales from research to market can be extremely slow, and too often, by the time research has been published, the market has moved on. Research and Innovation often have a very long lifecycle, which is very different from product development lifecycles. Usually, there are two quite different processes and expectations in play. The research timescale for those working on a Ph.D or postdoc is quite different to those of developers seeking to influence product design through innovation.

2. The growth of Co-design

Research based on co-design principles often seeks to be disruptive and start from scratch rather than building on the current landscape. Whilst co-design is heralded to engage people with a disability in the design process fully, questions emerged about the viability of co-design in creating market-ready products or services. There was a huge distinction between producing a prototype or concept, sustaining it, and bringing it to market. The creation of effective systems for co-design in incremental innovations of products has been less well defined than that for disruptive or blank sheet design.

3 Where is knowledge stored and accessed?

Ease of access to research studies and publications was discussed as a potential barrier for industry. Often such research is held behind a paywall, beyond the reach of many AT companies, especially small and medium-sized businesses. Few researchers seek to promote their studies beyond publication in high-impact factor journals and academic conferences. Industry representatives welcomed closer relationships with individual institutions. Moreover, they encouraged researchers to promote their activity in non-academic circles, use less specialised language, and feature a greater emphasis on the potential of the findings, with less focus on the methodology used.

Increasingly all recognised that the role of open-access publications was critical to reaching wider audiences, as were platforms such as medium to promote those findings. Research teams might benefit from developing a relationship with writers with the capacity to present concepts and innovations in accessible forms, utilising such skills would need to be included in research proposals and grant applications

4 The role of open source and the choice of licence

Often it was found that researchers had not considered the exploitation of their work. Questions on intellectual property and licence were specialist areas that researchers did not always feel confident determining. Where such confusion and ambiguity existed, it was more difficult for the industry to discuss exploitation openly. The use of open-source licences and creative commons for both code and designs did offer a possible way forward. However, such licences needed to allow for commercial exploitation by industry.

The shift to accessible EdTech and Consumer Technologies

One of the emerging issues in developing the relationship between research and AT companies was that the focus of research might be gradually shifting away from dedicated aids and devices with significant potential for exploitation and towards research into enhancing and making mainstream products more accessible, shifting the focus from assistive to enabling and accessible. Such products have the greatest reach, may offer lower unit costs, and are attractive for research. Such products,

notably apps, are relatively simple to bring to market. Apps are released through device "stores" with a company to receive income and support and further develop the product. Such apps are rarely bundled with assistive devices or hardware; hence, there is less motivation to link companies together to create a seamless solution.

It should be recognised that increasingly grants from public bodies such as Innovate UK are not just for research but for impact. The impact can address breadth, reaching the widest population possible, or depth, having a deeper, greater impact upon a smaller population. In practice, most innovations offer a mixture of breadth and depth.

Incubation

The increasing availability of incubation centres focussing on developing new companies to enter the AT market was welcomed. Incubation can both nurture a new company to enter the market or allow a company with a new product to be established and seek partnerships with existing AT companies and distributors.

For researchers interested in forming a company, the new incubation centres in Vienna, Austria, developed by Hilfsgemeinschaft[1] and the Adapt centre in Ireland, [2]were both initiatives with significant potential to facilitate new companies and help new products enter the market.

Other interesting approaches which could provide a basis for further consideration include the ATIA conference in the United States, which has a diverse set of stakeholders attending and which also publishes a journal linked to some of the presentations at the event. "Interface", based in Scotland, [3]is a government organisation that works with university researchers to identify appropriate industry partners. One company had recently worked with them to specify a challenge and had three credible enquiries, which led to collaboration. Similarly, the SETSquared scale-up programme [4]works with universities on a similar basis to Interface but also acts as an accelerator/adviser to scale up companies within their cohorts.

Research or researchers

Beyond the initial discussion of how to forge closer relationships between researchers and industry, some wide questions may emerge. Such questions consider the nature of that relationship beyond the introduction of products. One such issue for consideration was whether the industry wanted the research or the researchers. Whilst the research offered short to medium-term advances in tools for access and inclusion, the latter option was described as a longer-term opportunity to collaborate and work towards a given aim, bringing new skills and ideas to operate from within the industry itself.

[1] https://www.hilfsgemeinschaft.at/barrierefrei-werden/incubation-center
[2] https://www.adaptcentre.ie/
[3] https://www.sfc.ac.uk/innovation/interface/interface.aspx
[4] https://www.setsquared.co.uk/programme/scale-up-programme/

Whether the industry sought the research or the researchers, the value of research teams engaging constructively with the industry from the project inception and proposal stage was recognised. The relationships between the University of Southampton and AT companies at both a formal and informal level encouraged trust and led to a greater impact of the research on the lives of people with a disability. For some researchers, it led to a long-term role and function within the industry.

Understanding our partners

The importance of trust and mutual respect between academic and business partners was highlighted as essential in working together to bring products and services to market to benefit people with disabilities. Recognising and understanding the motivations of each was an important first step in any relationship.

Representatives of the assistive and accessible technology industry felt that it was important to recognise how academic research can differ from research and development conducted by a business. Both have a common intent, to produce better and more effective tools for people with a disability. But research and development activities are far more conscious that timescales for product development must be lean, and there is a focus on targets for release, both initial releases and updates and upgrades.

Companies may be constrained by size as a factor in engaging with research and which impacts on capacity to be proactive.

Researchers are more likely to be constrained by the availability and timescales of funding for their research and publication deadlines. A critical difference is that research, such as that leading to a PhD, may be planned over 3 or even 4 years. In contrast, commercial research and development will likely be undertaken over months, not years.

No forums are available to enable industry and research to tap into user experience, so often, user voices are missing from the initial conceptualisation of research and development projects.

Motivations

Both researchers and industry share many motivations for the work they are undertaking. They are often motivated by personal connections alongside commercial pressures or academic curiosity. Both share a common desire to see the impact of their activity but differ in that for researchers, the patent/IP/publication is the end of the process, whereas, for the AT industry, it is the start. Industry seeks to take the research and reduce the time to bring it to market. For the companies, the pace is critical

Universities

What universities seek from the research that is undertaken varies significantly. In practice, the aspirations of universities can vary hugely. Some universities have significant knowledge transfer

units that seek to ensure that income is generated from the research undertaken. Others have minimal interest in such an approach and remain focused on the influence of the research within the academic field. The variation in aspirations of universities makes building consistent relationships across different institutions more challenging.

Regardless of the commercial aspiration of the university, there was, in most cases, a desire to promote and share the research undertaken. As suggested above, for some researchers, publication in a peer-reviewed journal meets their needs for dissemination. It may be essential to establishing a reputation and building a career. Others do wish to see the outcomes of their labours distributed more widely, and this may include less "academic" publications, including blogs, and contributing design and code to public repositories. The most commonly used repository is GitHub for code. However, there may be benefits from expanding such an approach to building a more widely available and expansive repository, which has global reach and includes academic activity and the work of other innovators in the field.

Conclusion

Often, researchers and industry are driven by a common aim: to reduce social exclusion for persons with a disability. Despite this, there have often been periods of mistrust and misunderstanding between the parties. Seeking to ensure that research has an impact is most likely to occur when the parties establish longer-term dialogue, leading to partnerships.

This can be done between individual bodies linking together, encouraging industry leaders to offer a guest lecture on courses, and supporting students to undertake internships in AT industry businesses. But in addition, umbrella organisations such as DATEurope and AAATE or ICCHP should seek to understand knowledge transfer mechanisms and promote new and innovative ways to bring parties together. This should highlight real-world problems to shape research questions and share research outcomes to inform design. Such collaboration and partnership may be easier to foster or maintain based on the learning from the pandemic. The availability of cheap and accessible video conferencing platforms removes some barriers and costs of collaboration. It overcomes the issue of accessibility from an early stage, allowing the full participation of stakeholders, including people with disabilities, as co-designers.

Crucially, spaces for stakeholders to engage are extremely incredibly limited beyond traditional conferences such as AAATE/ICCHP. By their nature, these are focussed on serving the needs of academics and researchers. It may be time to instigate a process by which collaborative spaces can be identified which may serve as a starting point in building mutual understanding and trust between all stakeholders. Events such as the assistive Technology Forum in Switzerland offered one approach to this, but success will depend on ongoing and continuous communication.

Furthermore, promoting such discussions outside of academic settings is essential going forward. Industry focussed conferences such as ATIA in the US offer the potential to bring stakeholders together. Equally, universities should seek to encourage students to blog and summarise the key points of their published research whilst the industry can create a platform where such resources could be made available. The framework suggested by Banes (2021), referred to as "5x5x500", maybe a useful starting point.

Ultimately the need to establish collaborative workspaces that draw upon both the virtual and physical environments will be needed to build and maintain momentum.

References

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