vienna business agency

A service offered by the City of Vienna

User Centered Design

Technology Report

Vienna, January 2017

Address Vienna Business Agency. A service offered by the City of Vienna.
Mariahilfer Straße 20
1070 Vienna, Austria
Phone +43 1 40 00-86 70
Fax +43 1 40 00-86 720
E-mail info@wirtschaftsagentur.at
Web viennabusinessagency.at

Introduction

Dear Readers,

Vienna is among the top 5 ICT metropolises in Europe. Around 5,800 ICT enterprises generate sales here of around 20 billion euros annually. The approximately 8,900 national and international ICT companies in the "Vienna Region" (Vienna, Lower Austria and Burgenland) are responsible for roughly two thirds of the total turnover of the ICT sector in Austria.

According to various studies, Vienna scores especially strongly in innovative power, comprehensive support for start-ups, and a strong focus on sustainability. Vienna also occupies the top positions in multiple "Smart City" rankings. This location is also appealing due to its research- and technology-friendly climate, its geographical and cultural vicinity to the growth markets in the East, the high quality of its infrastructure and education system, and last but not least the best quality of life worldwide.

In order to make optimal use of this location's potential, the Vienna Business Agency functions as an information and cooperation platform for Viennese technology developers. It networks enterprises with development partners and leading economic, scientific and municipal administrative customers, and supports the Viennese enterprises with targeted monetary funding and a variety of consulting and service offerings.

Support in this area is also provided by the technology platform of the Vienna Business Agency. At technologieplattform.wirtschaftsagentur.at, Vienna businesses and institutions from the field of technology can present their innovative products, services and prototypes as well as their research expertise, and find development partners and pilot customers.

The smart city of Vienna is dedicated to ensuring that the application of technology in Vienna is also oriented to the quality of life of the individual. User centered approaches to technology development and indeed the entire product cycle represent one route and method of providing systematic technology support and, consequently, also the cost-effective utilisation of technology. With this in mind, this technology report presents an overview of the various trends and developments in ‘user centered design’, with specific consideration afforded to the commensurate specialists, protagonists and activities in Vienna.

Your Vienna Business Agency team

vienna business agency

A service offered by the City of Vienna

Contents

1 Focus on the individual – more than just a phrase

The current digitalisation of every sphere of life is not least the product of major leaps in technology. Technical advancements in areas such as big data, cloud computing, social media and mobile computing have resulted in an omnipresence of software within all sectors and, consequently, our daily lives. This digital transformation manifests not only in even greater convergence between the stated areas, but also in the establishment of sensor networks (buzzwords being 'Industry 4.0', smart home, Internet of Everything).

On an economic level, information and communication technologies facilitate cost-effective, scalable business models that can be implemented comparatively quickly and are an important prerequisite for innovations in general and the start-up boom specifically. In light of these developments, following a phase of technology-driven innovation, companies, developers and research facilities are once again perceptibly focusing on the individual (namely customers, users and citizens). Evidence of this in innovative practice can be seen in the establishment of expanding user centered methods and approaches to validate the user focus of products being developed, such as open innovation, living labs, rapid prototyping, agile, scrum, lean development and various testing methods.

User centered design involves the strategic assurance of customer and user orientation – from the concept phase through to development and distribution – to ensure validity and ultimately product quality through constant, iterative tuning and using a systematic, methodical approach throughout all the specified phases. Standard DIN EN ISO 9241-11 (in Austria ÖNORM EN ISO 9241) defines the following requirements in connection with the usability of interactive systems:

- Effectiveness in achieving a specified goal
- Efficiency in relation to operation of the system
- Satisfaction of users with a software

1.1 Product effectiveness based on user acceptance and participation

In the final analysis, a decisive factor for the success of any technology is the effective embedding of, for example, an app or office software within the context of real-world use for an online shopper or office employee. This aspect is particularly pertinent in the case of major projects with an extremely wide-ranging target group, such as a 'smart city'; in this instance ICT is a basic requisite and innovation driver for the competitive and innovative capability of the cities of tomorrow, while at the same time highly diverse manifestations of acceptance or 'digital literacy' are encountered. Essentially, technological solutions frequently require explanation and are often greeted with a lack of understanding or scepticism outside the IT sector. A similar situation is apparent in other areas, where narrow interfaces between humans and computers exist, such as 'Industry 4.0', or the complexity of the context of use is particularly evident, for example in the case of 'ambient assisted living' projects that are targeted towards older or impaired people.

This is where 'user centered' or 'human centered design' comes into play, on the basis of which greater consideration is afforded to the needs of users and customers in order to increase acceptance and participation and exploit the potential of information and communication technologies as a growth and innovative sector in an economically sustainable and socially acceptable manner. Currently, however, there is no broad consensus regarding the necessity of integrating these strategic approaches within the respective business models, while the terminology and understanding

of variously applied terms, methods and (sub)topics also differ. Terms such as usability, user experience, customer journey, design thinking, design, interface design, human computer interaction, or prototyping are all frequently expressed.

Nevertheless, clear definitions are available for the strategic and iterative employment of user centered methods within product development. Accordingly, “human centered design for interactive systems” is defined in ISO 9241-210:2010 and characterised by the following basic principles.

- Design is based on a comprehensive understanding of users, the tasks they carry out and their work environments
- Users are involved throughout the entire design and development process
- Refinement and adjustment of design solutions is continuously expedited on the basis of user centered evaluation
- The process is iterative to check customer orientation of the project
- The user experience in its entirety is considered during design
- The design team brings together multidisciplinary knowledge and perspectives.[1]

[1] Standard DIN EN ISO 9241-210:2011-01Title (English): Ergonomics of human-system interaction - Part 210: Human-centred design for interactive systems (ISO 9241-210:2010); German version EN ISO 9241-210:2010, List of contents. Online at: http://www.beuth.de/de/norm/din-en-iso-9241-210/135399380, 04.11.2015

Typically, user centered thinking within the product process also involves commensurate alignment throughout the entire company (as opposed to a more technology- or organisation-driven alignment). “We interpret human or user centered solutions as products, services and applications that strongly reflect the actual needs and wishes of customers and users,” explains Markus Murtinger of Vienna-based company USECON, specialist national and international advisors on the subject of experience design and consulting. This also means a rethink is necessary in terms of how these products and services are developed.

Reflection from a ‘human centered or user centered’ perspective is a philosophy of both thought and action. This specific focus sees the needs, values and context of users shifted to centre stage, in turn meaning that commensurate technical solutions have to be found. In highlighting the differences to the traditional development process, Manfred Tscheligi, founder of Usecon and head of the ‘Technology Experience’ unit at the Austrian Institute of Technology (AIT) and also professor for ‘Human-Computer Interaction & Usability’ at the University of Salzburg[2], states that “Individuals and their characteristics, in other words their embedding within corresponding real-life situations, deliver the key principles for development of a technology.”

Given that the needs and requirements of technology cannot always be articulated, it is important to ensure that users are not only (or not always) directly involved, but that the context of use is documented in a valid format using plausible methods. Methods such as design thinking, ethnography, or prototyping deliver findings on which measures are actually deemed needed, desired and useful.

Up to 90 percent of all innovation attempts fail, for one thing, because the needs and context of use are gauged incorrectly. New developments are too remote from habitual user routines or require (overly) extensive mental adjustments.[3] In the opinion of Professor Peter Purgathofer of the Institute for Design & Assessment of Technology at the Vienna University of Technology, “Development is frequently technology-centered, in turn giving rise to products that fail to meet the needs of the individual. Incorporation of the interests of the future user is increasingly becoming a unique selling point of successful products”.

[2] http://uni-salzburg.at/index.php?id=38601
[3] Reinhold Bauer, Prof. of Technology History at the University of Stuttgart in interview, in: Hauck, Mirjam: Was Nutzer nicht mögen. Gescheiterte Innovationen, in: SZ.de, 24.09.2014, online at: http://www.sueddeutsche.de/digital/gescheiterte-innovationen-was-nutzer-nicht-moegen-1.2142747, 06.09.2015.

2 Market relevance of user centered design

The number of companies becoming devotees of 'holistic customer focus' is on the increase in Austria, which may well result from the fact that major groups in the B2B market frequently pave the way and can only serve as limited role models for small and medium-sized businesses (possibly also operating in the B2B sector).

A prime example of this is Apple; with its focus on intuitive operating concepts and user experience, the American company has radically transformed the market. Meanwhile, major global players in a variety of areas are now endeavouring to clearly re-focus on the individual – examples being innovations such as voice or gesture control, smart environments tailored to the user, or the trend towards 'wearables' and location-based services. Nonetheless, a distinction should be made between whether a business case is 'human centered' or 'user centered' within the meaning of flexible alignment to customer needs, or whether 'the path', i.e. the entire product cycle to meet this end, was also 'user centered' in its realisation.

As such, the subject appears to have arrived on the market. "User centered design is obligatory," says, for example, Sandra Murth of IT-solution provider alysis, which specialises in user experience and usability. Experts at the Vienna University of Technology (TUW) are convinced that user centered design is 'a must' for any project encompassing user interfaces. Murtinger also affirms that "Interest is constantly growing, with related communities such as the 'Professional Association of German Usability and User Experience Professionals' also heavily expanding". In the shape of UXpro Austria, the Austrian organisation for usability and user experience, Austria too has an independent association devoted to promotion of the subject. The non-profit association organises events in Austria, such as UXCamp Vienna and the World Usability Day. Similarly, the popularity of UX-meetups in Vienna is also progressively on the rise.

A requirement that still needs to gain a firmer footing on the market and in the minds of developers is to ensure this is also methodically implemented with explicit planning and the commensurate expertise. Tscheligi adds: "Misgivings in terms of time and resource application are a frequent occurrence; however, such misgivings are easily resolved with corresponding planning and efficiency in terms of implementation." According to alysis, a greater tendency for

reluctance is apparent in companies or public bodies in a monopoly position. “But in areas where competitive pressure is more dominant, the benefits have already been recognised,” confirms Murth.

2.1 Economic effects

In terms of return on investment (ROI), individual use cases show promising results, above all when simultaneously considered within the scope of a strategic framework model. Internal drivers, for example, would be increased user productivity, savings on development through iterative design, or a reduced operational error ratio. In terms of external ROI drivers, factors frequently referred to include increased sales figures and greater customer satisfaction or lower customer support costs – as established by USECOM in a white paper with CRM update.[4]

User centered design affords a clear competitive advantage, whilst also striking a chord from the experts’ perspective as it leads to increased technological acceptance. Murth is convinced that “Good products are worth the money for most people. No one wants to waste their valuable time on things that are unnecessary, boring, or even frustrating because they were developed without focusing on the user.” She also points out that ‘user centered design’, for example in a business setting, enhances employees’ working environments and demonstrably improves motivation. An opinion also shared by Thomas Zahler, managing director of intuio: “The impact of optimisation and user experience methods on various key performance indicators can often be graphically illustrated and substantiated with simple computations.”

“Commensurate investment in quality has a demonstrably positive impact on other parameters,” agrees Tscheligi. Accordingly, the duly optimised design of processes can verify time savings. Respective optimisation of visualisation processes leads to greater efficiency in the interpretation of data and consequently lower error ratios. He also points to the subjective satisfaction that can significantly influence purchase decisions.

[4] http://www.usecon.com/wp-content/uploads/2013/05/usability_whitepaper_finale_DE.pdf

In terms of the market, user experience offers a unique selling point: “In a world simply inundated with digital services and commercial offers, outstanding user experience is the only way to positively distinguish oneself from the competition,” states Thomas Zahler, managing director of intuio. However, users must be incorporated in the respective projects from the very outset in order to ultimately achieve improved results that meet with greater acceptance. Assumptions initially made about potential customers, their needs, or the respective market need to be “continually reassessed and validated,” states Prof. Purgathofer of the ‘Institute for Design & Assessment of Technology’ at the Vienna University of Technology. Nevertheless, there is still work to be done in terms of convincing the various stakeholders that it makes sense to invest the additional time and money required up front.”

2.2 User centered design process

The user centered design process presents a framework model for transforming specific conceptual formulations into commensurate solutions, whereby the various phases are repeated as necessary in order to achieve the optimum results. “A tested concept must be in place even before the very first line of code is written, a design is drafted, or the initial prototype goes into production. This agile method offers enormous cost savings throughout the entire course of the project,” explains Sandra Murth of alysis, who also attaches particular importance to an iterative method in order to be able to learn from each individual step and optimise accordingly.

Usecon similarly emphasises the importance of maintaining the focus on user insight and continual re-evaluation also in the further stages (design, prototyping, realisation, evaluation). Such an approach, however, requires a change of perspective up front. Accordingly, the primary distinctions in comparison to traditional processes are the amalgamation of business, technology and customer perspective into a single goal, a methodical and systematic approach to customer findings and the introduction and measurement of customer centered KPIs (key performance indicators).

Tailoring a system to subsequent users and their preferences and anxieties requires a methodical approach extending well beyond a simple requirements analysis. Ethnographic studies are one such example, whereby researchers become part of a real-world setting regardless of whether this is an office, production hall or shopping boulevard.

This approach allows for the creation of solution designs that are adapted to the circumstances in question and which best match the needs of the target groups within the respective context based on commensurate empirical validation. Professor Peter Purgathofer advocates that, in each individual case, “The systematic inclusion of users in the iterative process is of critical necessity so as not to lose sight of the respective user needs, priorities, perspectives and wishes.”

A further difference compared to traditional projects is the intensive application of prototypes or prototyping. The objective of such is to test the future experience of a product or service with the aid of creative resources and tools. Selection of method depends on the context, whereby prototypes can be in paper form or also be digitally assisted. Thomas Zahler of intuio points out the advantage of “mapping interactivity and multi-device support within HTML, CSS and JavaScript for responsive designs given that static wireframes are unable to map such a high level of interactivity.”

In contrast to many other projects, ‘user centered design’ focuses on the human context at the time a requirement arises and/or the context of using a given technology, thus giving rein to more holistic thinking, affirms Christina Maria Busch of Research Studio Smart Agent Technologies. From the very outset, the project definition and requirements must be created in conjunction with the subsequent (operators and) users; while users must be considered and treated as equal project partners as far as possible and be involved throughout the entire project term. In this respect, quantitative data such as that obtained through market research provide initial references, but will hardly proffer the requisite insight in terms of the overall context, in other words the commensurate user rationale, values and preferences.

In the smart city context, it is important to ensure the inclusion of not only an elite minority able to invest a great deal of time and resources to participating in such a project through workshops and discussion events; as stated by Schnäbele: “Public participation must not essentially come down to the involvement solely of experts, which is a problem frequently observed.”

3 User experience, etc.: activities in Vienna

That ‘user centered design’ is gaining ground is also reflected in a progressively increasing number of related events; one such example of support in this field being the research call “Users in Focus 2016” sponsored by the Vienna Business Agency, which also organises various other relevant business events on the subject.

3.1 Training

In terms of training opportunities in the field of ‘user centered design’ at universities and technical colleges, the range of courses on offer has progressively expanded over recent years. As an example, since autumn 2015, the Life Long Learning Academy at the University of Applied Sciences in Vienna has offered a Master’s degree in ‘User Experience Management’. Unique in Austria, the study program leads to qualification in all relevant areas pertaining to user experience, usability and ‘user centered design’. Graduates of the course are able to professionally develop usable products and establish user-based development processes within a company environment. The course of study can be completed in three modular stages, with an opportunity also to gain international certification in Usability- (IBUQ) and Requirements Engineering (IREB). The Master’s degree ‘Media Informatics’ offered by the Vienna University of Technology also includes study of the complex of issues surrounding ‘user centered design’.

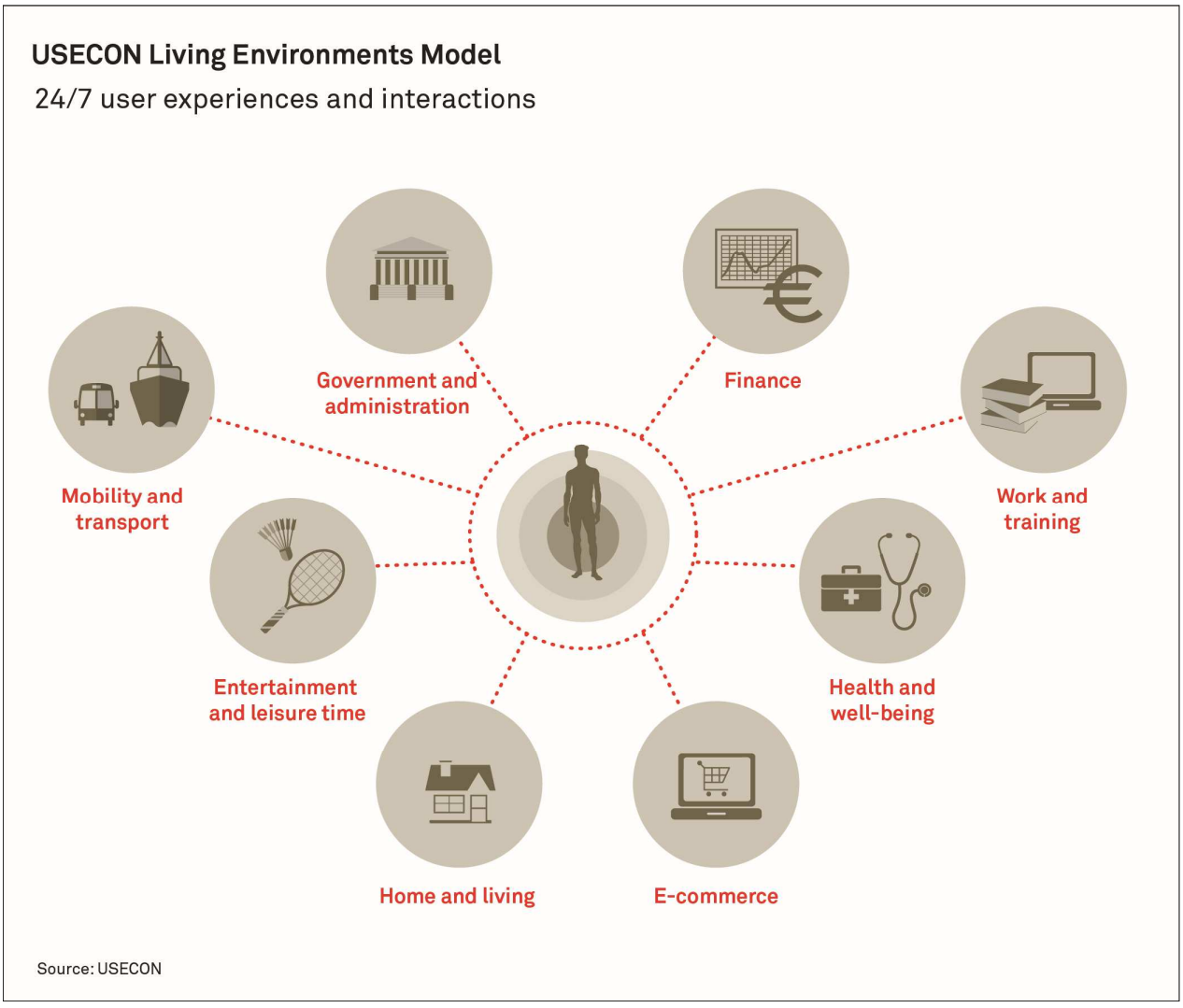
Other activities in this field are offered by the University of Salzburg at its 'Centre for Human-Computer Interaction', the 'Human-Computer Interaction Group' at the Vienna University of Technology, the Joanneum University of Applied Sciences (Graz) and Hagenburg campus of the University of Applied Sciences Upper Austria.

USECON and IT company alysis both offer training and courses for companies. In terms of the overall situation, experts state that "Much is still at the development stage, with a certain degree of catching up to do." Well-qualified employees in this field are consequently somewhat scarce, with 'learning by doing' and 'training on the job' currently the order of the day. Major Austrian companies are also progressively developing commensurate units.

4 Use cases

Generally, from the user perspective, no sphere of life can be disregarded. The trend is moving towards a 24/365 approach given that we are practically connected to information technology around the clock or otherwise supported by it in some shape or form. The trend for 'on-demand' and 'quantified self' systems, which gather personal status data with the aim of improving well-being, is also pointing in this direction.

Commercially robust areas are also apparent in 'banking and finance' and 'public and e-government'. As such, to offer an insight into domestic activities in this field, a number of use cases from exemplary sectors are presented in the following.



4.1 Health

One living environment that, from a social perspective, will also undergo enormous change is the health sector. A number of projects, such as those being carried out at the Austrian Innovation Institute or at the Vienna University of Technology, provide examples of how assistive technologies in the area of ambient assisted living (AAL) can support older people and persons with disabilities. Further insight into the future is similarly being provided by companies such as the evolaris centre of excellence, which was responsible for the development of an app for the rehabilitation of stroke patients, and Otto Bock, which was awarded the 2013 State Design Prize for a microprocessor-controlled knee joint.

The 'Centre for Applied Assistive Technologies' at the Vienna University of Technology has set itself the goal of helping older people without computer knowledge to participate in these opportunities in order to bridge the digital gap. One example of this work is the 'intelligent photo frame'[5] that incorporates 'hidden' Internet telephony features to enable those lacking in computer skills to use the device. As an example, simply tapping the photo of a person on the screen is all that is needed to make a call using this technology.

Other projects address the topic of activity monitoring, which, in addition to improved safety for older or disabled persons, also maintains a level of social contact. As an example, the project looks at how 'status updates' can be sent to relatives via the Internet. A particularly important aspect in this respect is ensuring the inclusion of the user in accordance with ethnic and data protection guidelines in order to preserve the rights, integrity and self-determination of the individuals in question. As explained by Paul Panek of the Vienna University of Technology, 'User centered design' is particularly important in the case of applications where users do not (are unable to) select a solution of their own accord and where acceptance is therefore not necessarily a given from the very outset.

Last but not least, the health sector is also being 'disrupted' by start-ups which provide, for example, self-diagnosis tools that necessarily offer fit-for-purpose handling of medical devices, sensitive data and mobile applications for a highly diverse user base.

[5] http://www.tuwien.ac.at/aktuelles/news_detail/article/8007/

4.2 Smart city

Examples of specific user centered approaches in the smart city realm are living labs, such as the Austrian Institute of Technology's 'Smart City Experience Lab', or also crowdsourcing to engage citizens. Crowdsourcing platforms to facilitate citizen participation, the brainstorming of ideas and creative cooperation are offered in Vienna, for example, by companies such as c-based, lekton, evolaris and Lynx Quest. To this end, companies, organisations, cities, regions and educational facilities approach the respective 'crowd' directly.

'User centered' or 'human centered' development within the smart city context does not present the population or those involved with a 'fait accompli'. These stakeholders are able to help shape the transparent process in which they are involved; while conversely, the commensurate platforms must assume a high degree of mobilisation and usability in order to attract and gain the commitment of a critical mass of users. Consequently, regional and city developments are obvious stomping grounds for 'user centered design' projects.

4.3 E-commerce

Generally, commercial activities provide a wealth of opportunities for user centered offers. Given the dynamic changes in terms of suppliers and user behaviour alike, a user centered approach can even be termed a necessity. Trends such as 'on-demand' or 'location-based' services render user centered design obligatory when it comes to facilitating an individual 'experience' for customers. The enormous number of offers also gives rise to demand-based models.

In the shape of its 'Web of Needs'[6] initiative, Studio SAT of Research Studios Austria Forschungsgesellschaft is endeavouring to counter the fundamental asymmetry between the large number of goods on offer and the minimal level of explicitly formulated needs. Specifically, the aim is to expand the Web with a needs-based, decentralised market infrastructure, whereby the stated objective is to create an open system within which offers and needs are published as objects on an equal footing and automatic matching services seek out the appropriate counterparts in each case. As such, to a large extent this will facilitate the automatic location of suitable solution options – including to meet more complex, mutually dependent needs (such as flight and hotel for a holiday trip).

In most cases, consumers are linked to sellers via an Internet search. Studio SAT is developing an infrastructure that will allow consumers to describe and publish their needs, before these needs are then ultimately matched to commensurate offers in a semi-automatic process.

"While preserving user anonymity, offers will be presented as matches to users in order that they may independently decide which provider they wish to contact; and all within the scope of an open infrastructure and open source published protocol," explained operational Studio manager Christina Maria Busch.

4.4 Work

As a result of digitalisation, the working environment is also undergoing transformation that is seeing human-machine interfaces skyrocketing. This ultimately involves digitalised office concepts and software-assisted, flexible working practices ('bring your own device') in equal measure to 'networked production', which digitalises internal processes and products and presents employees, partners and end-customers alike with both opportunities and challenges. Efforts devoted to analysis of this topic include those of the 'Technology Experience' business unit's 'Work Experience Lab' at the Austrian Institute of Technology.

[6] http://sat.researchstudio.at/web-of-needs

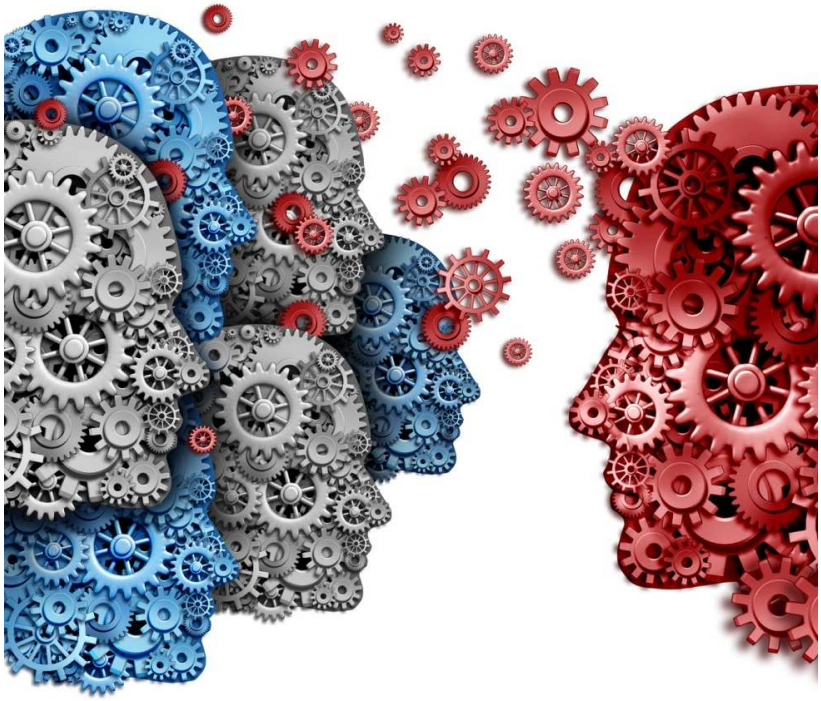
5 Trends

The topic of 'user centered design' or the 'human, business and technology' mindset is meanwhile gaining greater relevance. Evidence of this trend is apparent, not least, in the fact that companies are beginning to develop their own customer experience departments, while in the same vein, external consulting agencies are also in great demand. Above all in the field of software development, orientation in line with customer needs is on the increase, as is evident in recent years through methods such as scrum, prototyping and similar.

Such developments are also the result of economic considerations, in that a fall in IT budgets has increased pressure on decision-makers to achieve better results with fewer resources. Those continuing to pursue a technocratic approach will end up devoting enormous sums to development. By contrast, the current trend is moving towards longer analysis phases and evaluation with users, before ultimately embarking on development.

Trends such as 'quantified self' involving 'self-monitoring' – namely, the constant acquisition of health data, for example – have resulted in the omnipresence of interfaces and a ubiquitous need for 'user centered design'. The same can also be said of autonomous driving or Industry 4.0. A further indication of the topic's increased importance is reflected in the fact that participant numbers at the 'Human-Computer Interaction' conference, which is heavily supported by companies such as Google, Microsoft and eBay, have seen a ten-fold increase in the last 15 years.

Without 'user centered design' approaches, many innovative products would indeed still function in technical terms, but would nevertheless fail to fit seamlessly into the living environment of users – in turn leading to a possible lack of application and acceptance (negative 'experience'). In short, more than ever before, information and communication technologies are the basic prerequisite and innovation-drivers in terms of safeguarding the competitive and innovative capability of a city.



Ultimately, the efficiency and effectiveness of information and communication technologies depends to a decisive degree on the technical acceptance of each and every user (B2C and B2B), namely on how effectively technologies are designed from a functional, usability and operational perspective. Not only are areas such as the working environment, trade, leisure, entertainment and banking decisively influenced by software, its interfaces are also undergoing increasingly dynamic changes. At the same time, users are requiring an ever greater level of flexibility and direct 'on demand' capability in relation to design. A claim that is true today, but which will apply even more so in the future given the impending, increasingly intensifying interaction of humans with 'machines' throughout their daily lives.

6 Services Offered by the Vienna Business Agency

The objective of the Vienna Business Agency is the continuous development of international competitiveness by supporting the Vienna-based companies and its innovative strength, as well as a sustainable modernization of the business location. To achieve this, the Vienna Business Agency provides free consultations to all entrepreneurs in Vienna on the topics of business creation, business location or expansion, business support and financing. Furthermore, networking contacts in the Viennese economy are also made available.

The Vienna Business Agency supports and helps businesses complete their research and development projects with both individual consulting and monetary funding. Depending on requirements, they will receive information about sponsorships, financing opportunities, possible development partners, research service providers, or research infrastructure, according to their needs.

The Vienna Business Agency sees itself as a network of the Viennese ICT industry and supports businesses with consultations, as well with distribution and networking among themselves. Events and workshops on topics from the field of ICT are held regularly.

Additionally, the Vienna Business Agency helps company relocations or internationalization services. Help is provided to business founders and young entrepreneurs in the start-up area. Free workshops and training sessions on topics of everyday business are offered as well as small, affordable office spaces.

6.1 Sponsorship of user centered design: 'Users in Focus call'

'User centered design' projects can be put forward within the scope of various funding channels of the Vienna Business Agency, such as creative funding, innovation funding or research funding. Winter 2015/2016 sees the announcement of an internal research call specifically relating to this area. In the form of the '**Users in Focus 2106**' call, the Vienna Business Agency is supporting individual projects that focus on users throughout all phases of the innovation process with up to EUR 500,000. The call consequently fosters R&D projects that systematically consider the needs, requirements and living environments of the user. In particular, projects of an interdisciplinary and cross-technology nature are being sought, in addition to projects contributing to interface optimisation.

7 Companies and research institutions in Vienna

The alphabetical directory[7] listed on the following pages presents an overview of selected companies in Vienna that offer software and services relating to 'user centered design'.

An overview of Vienna technology businesses is also provided by the Vienna Business Agency's Technology Platform. At technologieplattform.wirtschaftsagentur.at, Vienna businesses and institutions can present their innovative products, services and prototypes as well as their research expertise and find development partners and pilot customers.

[7] This list provides no claims to completeness

Companies and research institutions

Companies	Since	Employees	Description	References	Contact	Website	Email
AIT Unit Technology Experience	2013	23	They examine selected User Experience factors as special standards for Experience Quality, create goal-oriented experiences in special technological areas and for special application contexts based on fundamental considerations of the future forms of interaction, and deal with methods and tools to support the development of high-quality Technology Experiences.	New possibilities in the creation of Experiences => for example the development of gesture recognition, motion-based interaction forms, pico projection, or tangible interaction. In order to formulate successful Contextual Experiences for the future, they carry out additional experiments with them and upcoming forms of interaction (e.g., food as interface).	AIT Unit Technology Experience Donau-City-Str. 1 A-1220 Vienna T +43 0 50550-4577 Contact person: Manfred Tscheligi	www.ait.ac.at/departments/innovation-systems/business-units/technology-experience/	manfred.tscheligi@ait.ac.at
Alysis	2011	9	Alysis is an IT services company with a focus on user experience and usability, app development, software development, and user experience seminars. Their customers come from the following sectors: Industrial, automotive, medical and e-Health, consumer, enterprise, public sector and e-government. They support their customers in the approach, design, and implementation of intelligent IT solutions and IT service products. Alysis enables customers to design products and services in such a way that the needs and requirements of users and customers are satisfied.	In addition to app development for industrial companies, Alysis develops medical apps like "Urtikaria" and "COPD Help", which help patients deal with their illnesses and serve as support for physicians. Additionally, Alysis develops sites and enterprise-level web services such as reiseinsel.at, yachtcenter24.com, and zeroemissioncities.at. Training sessions on usability and user experience (CPUX Certified Professional for usability and user experience) and innovation (INNUX Toolbox) round out their offering.	alysis GmbH Schrotzbergstrasse 6/1 A-1020 Vienna T +43 1 9463992 Contact persons: Ludwig Meyer & Sandra Murth	www.alysis.at/	office@alysis.at
CREATE.21st Century	2000	45	This company designs and develops media-training solutions in the fields of human resource management (recruitment, training, blended learning), marketing (digital marketing, web & app development), and change communication. International awards such as the German Design Award, Comenius Award, the eLearning Award, and inclusion in the IT Leaderboard confirm the high quality of their projects. CREATE is one of Austria's top 15 new media agencies and is the benchmark leader in eLearning content production.	With 7 locations in Germany, Austria, and Switzerland, CREATE works with clients such as: Audi, ERSTE Group, Salzburg AG, Deutsche Bahn, Siemens, Telekom Austria, REWE Group, UniCredit Bank Austria, G+F, University of Stuttgart, BMVIT, SEW Eurodrive, ÖBB, Vienna International Airport, and many more.	CREATE.21st century Taubstummengasse 7/3 A-1040 Vienna T +43 1 78 66 318 Contact person: Christoph Schmidt-Mårtensson	http://create.at/	office@create.at

Companies	Since	Employees	Description	References	Contact	Website	Email
evolaris	2000	35	As an innovative company, evolaris realizes the potential of digital networking. They advise companies in the selection of appropriate technologies, design custom application scenarios, and develop digital applications based on mobile devices and wearables. To ensure a unique user experience, evolaris delves into the living environments of end-users via the co-creation methodology and integrates it into each step of application development.	evolaris designs and develops innovative software solutions in the areas of Smart Production (smart glasses applications and Smart Services for Industry 4.0), Smart Commerce (mobile applications for customer loyalty) and SmartVision (applications for smart glasses and wearables in the tourism & leisure sector).	evolaris next level GmbH Spittelberggasse 3 II/6 A-1070 Vienna T: +43 316-351111 Contact persons: Udo Kögl & Christian Kittl	http://www.evolaris.net/	office@evolaris.net
GP Designpartners	1992	7	GP designpartners specialize in designing products and services that stand out dramatically from their competition and are popular with the majority of customers - unique yet popular. They succeed with a radical customer perspective and their four design principles: Analog, intuitive, concise, and universal.	They design their products for companies like Artweger (shower enclosures), smartflower (mobile small solar power station), Ottobock (surface simulator, neuro-prostheses, and software), Doppelmayr (lift station), City of Vienna (charging station), Siemens (hearing aids, remote control), Blaguss (bus terminal), Vienna Airport/Mazur (parking service), Philips (voice recorders), or JCI (conference registration).	GP designpartners gmbh Schottenfeldgasse 63 1070 Vienna T +43 1 5233598-0 Contact persons: Rudolf Greger & Christoph Pauschitz	http://gp.co.at	design@gp.co.at
intuio User Experience Consulting GmbH	2008	2	intuio is a consulting company and design studio based in Vienna and established in 2008. They make easy to use and efficient user interfaces for a variety of devices with different interaction methods for international customers.	They are proud to have successfully completed more than 100 national and international projects for, among others, NASA, Metropolitan Police, A1 Telekom Austria, Siemens, Otto GmbH, fielmann AG, Metropolitan Police, Lufthansa, KTM, and many more. The core areas are B2B applications, safety-critical applications, responsive user experience, and e-commerce.	intuio User Experience Consulting GmbH Lange Gasse 33/4a 1080 Vienna T +43 1 2363762 Contact persons: Thomas Piribauer & Thomas Zahler	http://intuio.at/	hello@intuio.at
Research Studios Austria Forschungs-gesellschaft (RSA) **Studio Smart Agent Technologies (SAT)**	2003 (2008 Spin-off from ARCS)	51 (RSA total - Studio SAT: 9)	The Research Studios Austria (RSA) Forschungsgesellschaft [research association] is an intermediary between university expertise, application-oriented research, and businesses. The Studio SAT is one of seven Research Studios Austria Research Association studios. The Studio SAT develops methods to combine the diversity of information from the Internet and to reduce its complexity. Their focuses are Machine Learning & Natural Language Processing as well as personalization, recommender systems, user experience management, and the open source projects Web of Needs & the easyrec® recommender system.	Scientific links with the Business Informatics Group at the Vienna University of Technology. R&D collaborations with 30 Austrian start-ups to date, including Flimmit, Wikifolio, ClearKarma, meinKauf, factline, Diagnosia, ubergrape, Hosted.by, Eversport, Rublys, Tripwolf, Payolution, or Gaminside.	Research Studios Austria Forschungsgesellschaft mbH Studio Smart Agent Technologies Thurngasse 8/2/16 A-1090 Vienna T +43 1 9042165-313 M +43 664 8251350 Contact person: Christina Maria Busch	http://sat.researchstudio.at	office.sat@researchstudio.at

Companies	Since	Employees	Description	References	Contact	Website	Email
Vienna University of Technology (TU)			The Institute for Design & Assessment of Technology combines technical, design, and social science research with applied, human-oriented development, and work with mobile and sensor based technologies. The research groups bring together different disciplines such as computer science, engineering, psychology, sociology, medical computer science, games research, music, media art, and design as well as evaluation of visualizations. The Institute is associated with the Department of Computer Science at the Vienna University of Technology.	The Institute for Design & Assessment of Technology consists of two research groups: Multidisciplinary Design (MD) and Human Computer Interaction (HCI), which is also home to the Centre for Applied Assistive Technology (CAAT, formerly Fortec). The Institute has a rather interdisciplinary orientation and covers areas such as computer science, engineering, psychology, sociology, medical computer science, games research, design, music, media arts, as well as the design and evaluation of visualizations. The research is based on technical, design, and social science research with a particular emphasis on users, in order to achieve both theoretically and practically relevant results that are tailored especially to humans. They have particular experience with: - Mobile and sensor-based technologies - Research approaches and qualitative ethnographic methods, laboratory-based user studies, exploratory and creative methods - Iterative prototyping and application development - Evaluation of on-site studies. The research makes contributions to a variety of areas such as learning, digital games, visualizations tailored for people, design for the elderly, health and wellness, healthcare and nursing, ambient assisted living, sustainability, music and audience participation, do-it-yourself culture, research ethics, and human cooperation and social interaction.	Vienna University of Technology Department of Computer Science Institute for Design & Assessment of Technology Workgroup: Multidisciplinary Design Group Favoritenstrasse 9-11 A-1040 Vienna T +43 1 5880118702 Workgroup: Human Computer Interaction Argentinierstrasse 8 A-1040 Vienna T +43 1 58801 18703 Workgroup: Centre for Applied Assistive Technologies Favoritenstrasse 11-187-2b A-1040 Vienna T +43 1 58801187701	http://www.informatik.tuwien.ac.at/fakultaet/institute/e187 www.media.tuwien.ac.at igw.tuwien.ac.at/hci www.aat.tuwien.ac.at	
USECON	2001	19	USECON provides expertise, solutions, and consulting in strategic experience management. A company specializing in consulting services for the activities associated with the user-oriented design of interactive systems.	USECON provides services for the entire product and service development cycle within the framework of user-centered design model. They've focused on the following four areas of work: - User research & analysis (collection of needs & requirements) - Experience design & prototyping (creation of user interfaces and prototypes) - Innovation & future (exploring future developments & trends) - Strategy & opportunity (anchoring a customer-centric perspective in the company)	USECON - The Usability Consultants GmbH Businesspark MARXIMUM Modecenterstrasse 17/ Objekt 2 A-1110 Vienna T +43 1 7435451 Contact person: Markus Murtinger	www.usecon.com	office@usecon.com

8 Imprint

Vienna Business Agency. A service offered by the City of Vienna.
A-1070 Vienna, Austria, Mariahilfer Straße 20
viennabusinessagency.at

CONTACT: Christoph Henrichs, Technologie Services
T +43 1 4000-87083, henrichs@wirtschaftsagentur.at

PHOTOS & GRAPHICS: Vienna Business Agency, Fotolia, iStock Fotos, Vienna Business Agency/David Bohmann, Vienna Business Agency/Christian Husar, Vienna Tourist Board/Christian Stemper

ICT DATA SOURCES: Statistics Austria, G. Haber, METIS, University of Klagenfurt "Impact Analyse: Software und IT-Sektor 2011," KMU Research Austria, Economic Database

LAST UPDATED: January 2017

Technology reports are available on the following topics:

- Big Data Open Data
- Cloud Computing
- E-Government
- E-Health
- Emerging Technologies
- Enterprise Software
- Entertainment Computing
- IT-Security
- Mobile Apps
- User Centered Design
- Visual Computing

The digital versions can be found at https://viennabusinessagency.at/technology/technology-location-vienna/

At technologieplattform.wirtschaftsagentur.at Viennese can present their innovative products, services and prototypes as well as their research experience to enterprises and institutions in the technology sector and find development partners and pilot customers.

The information and networking support offered in the key areas of information and communication technologies, energy, environment, mobility & construction, production technology, and process engineering is funded by the "Intersectoral platform for technology developers project", part of the EFRE's Investments in Growth and Employment in Austria, 2014 - 2020 programme.

Europäische Union Investitionen in Wachstum & Beschäftigung. Österreich.