Digital Agenda Vienna

Municipal Directorate Vienna – Division Organization and Security
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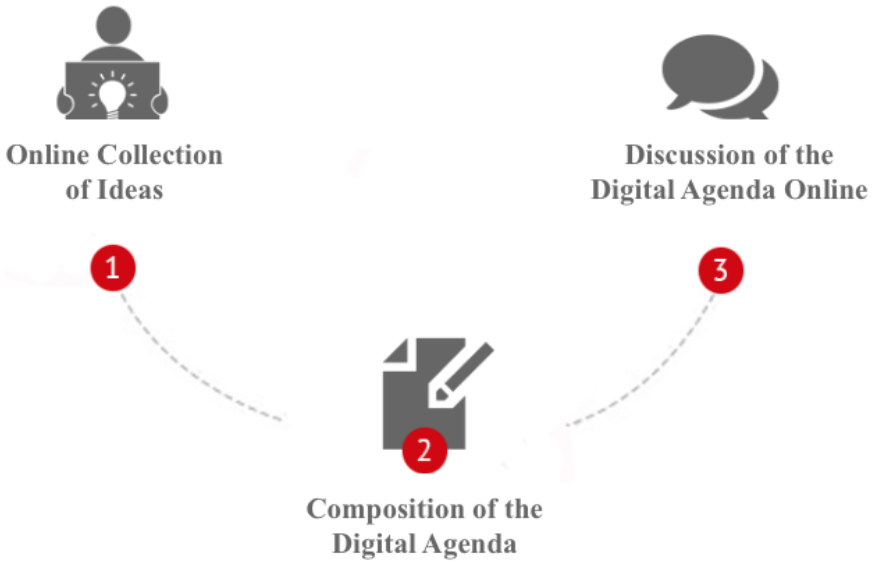

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Abstract

The Latin origin of the word ‘agenda’ essentially means ‘things that ought to be done’. With this in mind, the Digital Agenda Vienna can be seen as a ‘to-do list’ for the city. It summarizes which projects and activities in the area of information and communication technology (ICT) will fall under the responsibilities of the city council.

This in itself implies that the Digital Agenda Vienna does not comprise a rigid set of rules, but is a working document – an overview that will continuously develop and improve. This makes sense, as the demands of our citizens and our technical possibilities are constantly evolving. How the City of Vienna can deal with these demands and possibilities is a question that the Digital Agenda Vienna ultimately aims to answer. In so doing, we address the following questions: How can the potential of new technology benefit the citizens of Vienna? How can we take advantage of these opportunities, while also avoiding the risks associated with these new technologies?

Considering these questions, the Digital Agenda Vienna is a logical addition to the existing strategic documents in the area of research, technology and location policy. Ultimately, however, it encompasses far more, as technological developments continue to play a decisive role in key aspects of city life.

Putting Users First

The main focus of the Digital Agenda Vienna has been the various users that live within its (the) city. Their concerns, needs and interests have been the guiding principles for setting priorities, implementing projects and designing new services. That is why the involvement of users is an essential component in all related processes.

Digital Agenda Vienna’s current proposal has also been a result of this focus. It was not conceived behind closed doors but elaborated with the participation of hundreds of interested people. That is why any further development of the Digital Agenda Vienna will also be carried out in a transparent and open manner.

The Digital Agenda Vienna is consistent with the “Viennese principles” that have emerged in the course of this discussion process. This refers to the nine guiding principles that the city uses to lead the development of new technological opportunities. In addition to transparency, openness, and participation, this also includes trust and security, inclusion and social sustainability, gender equality, citizens’ orientation, the strengthening of business locations, consolidation, innovation, as well as flexibility and learning.

It is these principles that render Digital Strategy Vienna unique, and ensure that the opportunities and potential of digital development benefit all Viennese citizens. However, these principles must also be lived (experienced?). That is why we invite you – and all people living in this city – very cordially, to participate in this process and dialogue.

"The Nervous System of the Smart City"

We live in the age of the digitization of all areas of life. The City of Vienna aims to meet this challenge by using the Digital Agenda Vienna as a strategy to show how to successfully deal with such a process of change. This strategy can also be seen as compatible with Vienna's development into a Smart City.
With the "Smart City Framework Strategy", the city of Vienna has given itself guidelines on how to counter the challenges of the future. Focus will be placed on ensuring a high quality of life for the population, the protection of resources, and the added value of innovation. To achieve these objectives we require the use of advanced technologies, and processes. The digitization of infrastructures, organizations, and lifestyles (e.g. education or health) is therefore a key strategic objective for the city. Information and Communication Technologies (ICTs) have become the nervous system of "smart" cities.

Representing the Smart City Framework Strategy

The importance of information and communication technologies in society cannot yet be fully grasped. New business models, the change of working environments and qualification requirements, a rebalancing of centralized and decentralized modes of production, as well as the acceleration and individualization of many processes, have led to fractures in the existing social conditions. It is not without reason that some writers are talking of the third and fourth industrial revolutions. It is gradually becoming clear what opportunities and risks the extensive use of ICT in most areas of life will bring about. The challenges of current technological developments, such as cloud technologies, big data-analysis, or the Internet of things, are already becoming apparent. Such breaks offer tremendous opportunities for innovative city management, but also lead to uncertainty among the population.

The City of Vienna has always responded to challenges in the public services seriously, and has found solutions to increase the quality of human life: Vienna is one of the most liveable cities in the world for good reason. With the "Smart City Framework Strategy" Vienna has formulated its goals for 2050: Smart City Vienna (accordingly) is the development of a city in which the issues of energy, mobility, building, infrastructure, and technologies, as well as health, education, social affairs, and inclusion as a whole, can be further developed. The aspect of inclusion is given special consideration. In 2011, with its Open Government Initiative, the city government laid another important foundation, which will continue to play a strategic role in the years to come. With the end of 2015, "Innovative Vienna 2020" – the strategy for research, technology and innovation (RTI) – will be introduced, followed by further strategic statements on the development of the RTI-location, and on the use of the city's innovative potential.

The Digital Agenda Vienna presented here, views itself as a contribution to achieving the Smart City-goals, by ensuring that new technologies are optimally utilized. Technologically driven innovations are thereby linked to socially driven innovations, and place the needs of people at the centre of this project. Smart City Vienna differs

from other Smart City initiatives, because people are given priority, rather than the use of technology per se. As users of information and communication technologies are at the centre of its strategy, the Digital Agenda Vienna will seek to ensure that the services of the city will continue to be available to all. Nobody should be excluded from the Agenda, as the so-called "digital divide" – i.e. the disparities in technical expertise between citizens – must be prevented (ameliorated).

Neither the city's cleaning services, energy supply, schools, transport, health facilities, food supply nor the general administration of Vienna can function without ICT. Information and communication technologies do not only ensure the safe functioning of the city, but also offer a major opportunity to provide innovative and clever services to citizens, in accordance with our understanding of a Smart City.

In addition, the ICT sector has become a very important economic factor (force/contributor) in (the city of) Vienna. About 54,000 employees, more than 5,700 companies, and an added value that is four times as high as the Viennese tourism industry (study by Technopolis: "ICT location Vienna – Facts and Figures", 2013) speak for themselves. Even in its first official RTI strategy proposal in 2007 ("Vienna thinks ahead"), the City of Vienna had already defined ICT as a key issue. Thus, the Digital Agenda Vienna sees itself as a logical complement to the city's research and technology strategy, as well as supplementing the objectives and measures of the Vienna Business Agency, within the scope of a comprehensive regional economic policy.

Moreover, a greater part of the population has an increasing desire for participation (involvement), collaboration (cooperation and contribution) and a range of services that accommodate their own personal circumstances or usage behaviour. Digital democracy, social participation, and transparency are key concerns. With creative and innovative products, the City of Vienna is entering into a dialogue with its citizens, and is thus contributing to the democratization of knowledge and information. On national and international levels, Vienna will continue to fight for net neutrality and for net freedoms to be enshrined as fundamental human values.

This process of change, which is currently carried out in connection with the process of digitization, is no short-term trend. It will continue to preoccupy the City of Vienna for the coming decades, and is not an exclusive issue for IT departments, but an important strategic issue, that is relevant for the future of public institutions, such as the economy and society as a whole. It requires the questioning of previous patterns of thinking, and the learning of new technological skills and management approaches.

The Digital Agenda Vienna will also identify spaces within the city, so that its citizens and its guests can shape and promote these developments together. For the City of Vienna, information and communication technologies have been promoted from an initial supporting role, to an essential component of strategic planning.

Creation and Development of the Digital Agenda Vienna

The Development Process

The current draft of the Digital Agenda Vienna is already the result of the "new way of thinking", which it elaborates on. It is not created behind closed doors, but is the result of a collective work process. Over several months, a few hundred interested colleagues from the City of Vienna and urban enterprises have been involved in the development of ideas. In five working groups these ideas were then examined and discussed. Work on the final text is currently open to public participation once again.

This cooperation was only conceivable and possible through the advent of innovative technologies. Above all, it required a break from the traditional and hierarchically imprinted working methods that had been the norm. It is only when new technologies and new ways of thinking come together that the impossible becomes possible.

The Current Draft

The following chapter, also called "Fields of Action", presents the possibilities that become available through increased digitization. In each field of action "flagships" are set as centrepieces, and will be drawn up as guiding projects for the next five years. Some of these flagships are already being realized as a result of this participation. Moreover, short and medium term priorities will be formulated, which need to be strengthened in combination with the institutions of the City of Vienna. The fields of action are based on the ideas developed during the participation phase of the development process, and the work produced in the working groups. In the footnotes the respective proposals will be referenced as clearly as possible.

In addition to implementing the flagship projects and the priorities that we have set ourselves, there are many more ideas and measures that have been discussed by the working groups, which extend beyond the contents of the fields of action. A detailed presentation of these ideas and actions can be found in Annex 1. These projects can be understood as impulses for the City of Vienna. They should be discussed in the next few years and gradually implemented, provided that a consensus and the necessary financial resources are available.

Continuous Development

The result of the whole process – the Digital Agenda Vienna – should not be seen as law carved in stone. As a working document it aims to stimulate its readers to reflect, set guidelines, identify flagships projects, propose ideas, and define accountability. The Digital Agenda is a strategic planning process, the value of which unfolds through collaboration, and will continue to develop dynamically over the next few years.

In the future, the City of Vienna will reflect on the implementation of the planned key priorities, measures and projects online (www.digitaleagenda.wien) and offline via working groups attended by its citizens and the Viennese ICT industry. In addition, the

online platform will provide an annual opportunity to propose new projects and ideas for the further development of the Digital Agenda Vienna.

"Viennese Principles" as Guiding Principles

Following the creation of the Digital Agenda Vienna and the thoughts and actions of all those involved, nine guiding principles have emerged from the process. These are enshrined in the following "Vienna principles" of the Digital Agenda Vienna. We should abide by these principles, because times of great change require principled action.

1. Trust and Security: The citizens' trust in information security is critical for every aspect of the City of Vienna's activities, and is the basis of a modern city. The security of infrastructure, information, and communication is a top priority, and is to be continuously examined.

2. Transparency, openness and participation: More than ever, the City of Vienna is developing from a closed bureaucratic model to an open and participatory city. The active involvement of citizens with smart IT platforms is becoming the standard in the City of Vienna, and this gives rise to creative and innovative partnership solutions. Transparency and openness guide the attitudes and practice of administrative procedures.

3. Inclusion, solidarity and social sustainability: Digital change is a major challenge for political institutions, public management, the economy, and for the entire population. The City of Vienna will ensure that no one is left behind and that all services remain accessible to all people of the city – regardless of education, background, and income. The principle of inclusion is central to Smart City Vienna.[1]

4. Gender equality: Women of all ages are underrepresented in digital professions, and in the digitized world in general. Establishing gender equality in this significant social and economic area is an essential priority for the City of Vienna.

5. Citizen's orientation: Public administration is a service for the citizens. The City of Vienna justifies the digitization of processes and services as a result of the changing lifestyles of its citizens. For their concerns, the city is available online seven days a week and 24 hours a day.

6. Strengthening the business location: The ICT industry has evolved in recent years into one of the most important economic forces in the City of Vienna. The further expansion of this industry is an important task for all those involved.

[1] Idea 27: To consider
Idea 144: Barrier-free Vienna through technological support
Idea 158: Quality check

7. Consolidation: The City Council of Vienna and its companies are perceived in a citizen-centred manner. A coordinated and consolidated approach is a prerequisite for the efficient and effective development of information and communication technologies for the City of Vienna.[2]

8. Innovation: In times of dynamic change, characterized by new ideas and multidisciplinary approaches, information and communication technologies have an even greater strategic importance and must be kept in mind. The City of Vienna is meeting this challenge by not only providing an additional framework for innovative projects, but also actively supporting the growth of a culture of innovation. Together with the RTI strategy, "Innovative Vienna 2020" aims to contribute to the Digital Agenda.

9. Flexibility and learning: Meeting the challenges of the digital transformation requires a learning organization with a high degree of mobility (agility) and flexibility, which allows mistakes to be made and an openness to change. This in turn requires the use of new management methods that support the City of Vienna's innovation culture, the modification of processes, and the use of the innovative technologies of the digital age.

These principles serve as a guide in order to guarantee that the values that made Vienna prosper in the last century also hold true in the era of digitization ahead. Digitization should be used in the context of these 9 principles as an opportunity for enhanced solidarity, as embodied by the City of Vienna. The risks inherent in this process of digital change, as a result of the power of the Internet and the rapidly increasing volume of data, must be seriously considered and discussed at every stage.

[2] Idea 136: Concentrate the City of Vienna's ICT
Idea 170: Consolidating the ERP system of the City of Vienna

"Networked with security"

For many years, information security has been of prime importance in the City of Vienna. ICT-systems have become the foundation of Vienna's business ventures. With the increasing digitization of all city services and processes, ensuring citizens' trust in the security of our ICT-systems, data, and services, is essential.

The protection of data – belonging to citizens and others within the City of Vienna – is necessary for building trust in the digital world. This means that personal data may under no circumstances fall into the hands of an unauthorized third party, or become subject to third-party manipulation.

Likewise, in the context of available and secure information and communication technology, guaranteeing reliable and safe infrastructure (for example in the health and social services, in the education, energy, water, sewage, waste disposal, and transport sectors, etc.) is a vital concern of the City of Vienna. To ensure safe, trouble-free and efficient public services for citizens, these must be guaranteed through appropriate information security measures.

The City of Vienna has already taken a number of measures to ensure a high level of ICT security. To this purpose, an ICT security organization has been set up, which is based on two main pillars: organizational-legal security, and technical ICT security. For its services and processes a Computer Emergency Response Team (WienCERT) was established, which takes preventative and reactive measures against ICT threats, and participates in regular ICT security exercises. To minimize potential damages, ICT threat situations are continually assessed, and suitable measures for risk reduction and prevention are regularly adopted. The challenge is to achieve an appropriate level of ICT security.

The City of Vienna must inspire its citizens and the economy with confidence, that any data they entrust it with is handled with care and according to its intended use.

Therefore, this field of action requires considerable attention, and, in the context of the Digital Agenda Vienna, marks the basis of our actions.

At the heart of this field of action is the following flagship project:

Proof of Safe and Transparent Data Handling[3]

The City of Vienna ensures that the collection, processing, transmission, and storage of data are in compliance with data protection laws, and that the highest level of data security is ensured. In so doing, it ensures information on the traceability of its use. In

[3] Idea 8: Safety initiatives in the education sector
Idea 48: Encrypted communication between authorities, departments, etc.
Idea 105: Contact point for IT-safety

order to guarantee confidence in the safety and protection of the data, the City of Vienna not only takes organizational-legal and technical measures, but also raises awareness of its safe handling of data.

The City of Vienna provides personalised evaluations, allowing citizens to review the use of their data in the ICT System. These document the traceability of the use of the personal, sensitive, as well as statistical data, of the citizens concerned. In addition, the City of Vienna is considering the establishment of a portal, at which citizens and other people concerned can access information on the organizational unit of the City of Vienna at which they accessed and submitted data, and on the capacity in which they did so. The timing and the reason for access are also recorded.

The citizens and other people concerned can, in accordance with the statutory regulations, restrict or expand access to their data.

Further Key Topics

In addition to the implementation of the flagship project, further priorities are set in this field of action:

Identity management[4]

The City of Vienna provides the necessary organizational and technical infrastructure for citizens using third-party and city services to authenticate and identify themselves, via a connected (federated) digital identity management platform. The federated identity management platform is independent of the issuer of the proof of identity. A central service of the City of Vienna supports the production of identity documents by various service providers. Existing tools, such as the citizen's card or mobile phone signatures, should therefore be increasingly used. The City of Vienna provides the necessary organizational-legal and technical infrastructure, which, in connection with the use of the services of the City of Vienna, makes federated identity management possible. However, the provided identity documents must comply, on the one hand with the required safety level of services, and on the other hand with international standards (for example eIDAS, STORK, etc.).

Secure access to data – "Vienna roaming"[5]

In addition to the transparent use of data, the secure access to the data and services offered must also be made easier for citizens and other stakeholders.
The aim will be to summarize the existing WLAN-infrastructure to form a Vienna-wide WLAN-infrastructure with increased ICT security (see also chapter Digital Infrastructure: "Vienna roaming"). For example, if a person is located within a network infrastructure of the City of Vienna or one of its "Vienna roaming"-partners, s/he should be able to use this infrastructure through federated identity management. The operator of the access point to the "Vienna roaming" then takes over the forwarding to the identity provider, which performs the authentication of the person and issues a "ticket".

[4] Idea 97: Promoting the Citizen Card
[5] Idea 88: Secure WLAN / Vienna ROAMING

Promoting Encryption

The City of Vienna will use cryptographic measures (encryption) in order to guarantee the protection of personal and sensitive data, and will provide citizens with secure and cryptographic channels for communicating with the City of Vienna.

Increasing ICT – Security Awareness

The City of Vienna is planning to strengthen the security awareness of citizens for information and communication technologies. Specifically, people are supported in the safe handling of equipment according to their specific lifestyles and needs. This may be effected, for example, by specific sites that warn of dangers on the Internet and provide recommendations for the safe handling of ICT, during workshops on security issues, and during annually held “Security and Safety” fairs.

3. Chapter: Services for the Citizens

"We give the People Time"

In the centre of a smart city are its citizens – their views of the City of Vienna are to contribute significantly to improving its services. In the past, there have already been opportunities through feedback, via the eGovernment services (platform?) of the city, to help improve the city's services. These efforts will now be intensified, and the involvement of the people of Vienna will be expanded into a significant organizational principle. A focal point will be to question existing processes, and to change them where necessary.

The eGovernment services of the City of Vienna have already received international recognition, and act as a role model for Europe. These will be further expanded with the new possibilities made available by increasing digitization. The resulting digital services will be varied, and will make it easier for citizens to find their way around the City of Vienna's administration.

Smart City Vienna is "the city of short distances", and the digital services shall make a significant contribution to this effect. It is important that the digital services save time for the entire population and for businesses. Therefore, it is essential to orient the agenda to the different living conditions of the people.

The active participation of the population plays a central role. Collaboration with the citizens, their feedback and their "view from outside" should guide the development of digital offers in the future. Digital and analogue participation processes become the norm, and thus provide a significant added value for society. Digital democracy is thus available and noticeable.
At the heart of this agenda are the following three flagship projects:

Citizens Portal[6] "Close to my City"

The City of Vienna is setting up a Citizens Portal that serves as a central contact point for their concerns ("Single Point of Contact").

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[6] Idea 1: Citizen services
Idea 3: E-Government
Idea 5: Exact information
Idea 15: Electronic voting
Idea 25: Documents for official channels
Idea 36: Theme-Cloud
Idea 37: Citizens Portal
Idea 52: Help for Support
Idea 60: Kindergarten and School
Idea 86: Media interruption via payment form
Idea 99: ICT as synergy
Idea 108: Every citizen is a project
Idea 110: Digital voting
Idea 118: Central Web Portal and App for concerned citizen
Idea 142: Services in Vienna
Idea I43: WWnda (Wien, Wien nur du allein – Vienna, Vienna, only you alone)
Idea 156: The magistrate as the central point of contact

This portal offers to all those who want to take advantage of the services of the City of Vienna uniform and transparent (?) access to digital services. Important information for every living situation is available locally and in an easily accessible form.

At www.wien.at a personal space has been created for all Viennese citizens to access their preferred city services in combination with their personal management data in one safe place. This "Service Cockpit" provides an overview and enables the citizens to follow procedures online. Notifications via email and/or text message inform users about status changes or already completed processes. Through secure authentication (e.g. via citizen's card or mobile phone signature) this personal information will be protected from unauthorized access. These online administration routes offer users considerably more comfort, for example by providing pre-filled forms. Furthermore, it is possible to complete some procedures entirely online, as for example with a pay interface. Deliveries from the City of Vienna can be retrieved online and thus save citizens a journey to the post office. Secure personal data storage allows users safe access to government documents, including documents such as invoices or issued notices, at any place or time.

The Citizens Portal also features personalized services around the city. It provides automatic notifications about chosen interests (e.g. events, cycle paths, parking zones, etc.), subscription-based newsletter and RSS feeds, as well as providing convenient control with citizen cards or mobile phone signature services for retrieving insurance data or pension account information.

City of Vienna-App[7]

For the purposes of innovation and citizens' orientation, the City of Vienna app allows the use of services via mobile devices. Without any detours, users can access services available online in any situation.

The City of Vienna app is designed as a so-called "umbrella app", where current and seasonal offers are grouped and can be configured by users individually. It also offers the possibility for international guests – of course in various languages – to access useful, mobile information (for example maps, opening times, events etc.), guaranteeing a pleasant stay in Vienna. The simple personalization process allows automatic notifications to select for services and special interests. Thus, the City of Vienna app is a mobile assistant for all people in the city. In addition, a concerns/complaint function and participatory elements are included to invite citizens to help shape digital development.

Developed apps from the open data community are already being included. Almost all interfaces used by the City of Vienna app, are freely accessible and published as open government data.

[7] Idea 47: Native App for the City of Vienna services
Idea 75: New Public Management App
Idea 104: Whats-App for inspirations and complaints
Idea 151: "What I encounter"-App

Use of QR-Codes[8]

QR codes in office buildings, on forms and information brochures of the City of Vienna enable direct access to the desired information on the respective websites. The possible usages for QR codes are far from exhausted. One possible application might be, for example, the payment of administrative penalties. In addition, the use of iBeacons is also being examined – a technology that is particularly suitable to providing information on tourist attractions or monuments.

Further Key Topics

In addition to implementing the three flagship projects, other topics have also been examined:

Digital Participation Culture[9]

"Vienna has 1.8 million brains, let's use them": This motto of Smart City Vienna is also a call for "crowdsourcing", and for the transition from a bureaucratic management model to one that is characterized by participation. For the City of Vienna, it is particularly important to reinforce citizens' involvement in the development of the city.

Following the successful participation process of the Vienna Charter, the current process of the Digital Agenda has also shown that the establishment of a participation culture in the City of Vienna, featuring digital and analog components, remains a core component of this area of activity.

The aim of the City of Vienna is to further strengthen the involvement of citizens in various projects, and to centrally make the necessary information easily available and transparent. For this purpose, digital platforms are established, and actively supported. By this means, a digital community in Vienna is created, and the citizens become aware that they represent the city, and that their opinions matter. These platforms optimize citizens' knowledge of the city, and make it possible to discuss significant events in moderated forums. Access to the participatory events remains effortless, and it is always ensured that analogous processes are also available. Through the combination of online and offline processes, nobody is excluded from participation.

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[8] Idea 4: QR-Codes at tourist attractions
Idea 150: Paying for fines via QR-Code

[9] Idea 23: Mobile GIS – Application development
Idea 24: MiniJobs per App for citizens
Idea 29: Digital participation at public
Idea 45: An overview to current 'participation projects' and consultation in Vienna
Idea 76: Vienna bets on participation and utilizes crowdsourcing
Idea 85: ICT in dialogue with the economy, politics, public management and citizens
Idea 101: E-Democracy DIGITAL
Idea 107: More such initiatives
Idea 114: IT coordinates citizens who want to make Vienna more livable
Idea 149: Shaping the city from your mobile

Living in Vienna[10]

In recent years, numerous improvements to the online service offered have been implemented in the area “Living in Vienna”. It is now a question of going further, supporting the digitization of “Living in Vienna”, and to provide the same high level of service online. Especially when searching for an apartment, the service offered should be tailored to the personal needs of the citizens.

To render the housing and real estate market more transparent, all the available offers in the City of Vienna will be accessible via one online platform. The citizen’s portal should provide information on available apartments in the City of Vienna, released by Open Government Data. The purpose is to ensure an all-encompassing housing and real estate search platform, which would include privately financed, funded cooperative and municipal housing.

Managing Waiting Times[11]

Waiting in offices, at service centres or health service providers takes time. By means of electronic and mobile communication, waiting times can be shortened, on the one hand via electronic appointment reservations, and on the other hand via timely mobile notifications in case of deviations from scheduled appointments.

The waiting times for service centres, offices and health service providers will be optimized through the use of digital solutions, thus enabling citizens to save time. The Citizens Portal can play a significant role, and make services, such as reserving appointments, available and also accessible from a mobile phone. The service immediately informs the user of any changes, and can be integrated into his/her personal calendar, as well as social media account.

Smart Health[12]

Innovative technologies also provide new opportunities in the health and social sectors. The City of Vienna wants to take advantage of this, to establish a "Smart Health" initiative and to promote it as part of Smart City.

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[10] Idea 139: Living in Vienna
Idea 161: Search engine for ‘Feeling well’ in Vienna
Idea 169: Digitalizing the ‘Schwarzes Brett’ (Bulletin Board) in residential building
[11] Idea 9: Reserving your visit to a walk-in clinic
Idea 11: Arranging an appointment with your doctor
Idea 17: Receiving the current number of your waiting ticket at administrative offices online
Idea 19: Information on your waiting time at the walk-in clinic
Idea 66: Reserving a time for an examination at the doctors
Idea 67: Call “Please come now” instead of lingering in waiting rooms
[12] Idea 30: Paperless Medical Rounds
Idea 13: Apps and software development in the healthcare sector
Idea 57: Mobile Health Solutions
Idea 68: Aua – where is the next available doctor?
Idea 69: “Flying Doctors: instead of waiting feverishly in waiting rooms
Idea 133: Free access to health information
Idea 164: Guide towards medical treatment

The aim is to transform Vienna into one of the leading "Smart Health" cities in Europe. The health and care system of the City of Vienna is to become even more efficient and modern with the use of mobile solutions to promote preventive medicine through social media, through support for older persons with handicaps, as well as through the development of telemedicine services.

Technologies are being examined that can aid the elderly and people in coping with limitations in their daily lives.[13] It is particularly important that these devices are as easy as possible to use. The use of Information and Communication Technologies (ICTs) can support aging people who wish to live in their home independently or as independently as possible within care facilities. This can be supported, for example, through telemedicine services, or easy to use technology that has been developed especially for the elderly. In the context of events held for senior citizens, their reservations against using smartphones or tablets should be reduced, and the basic functions explained.

The Citizens Portal can also remind and inform users of appointments (for example, vaccinations) and health recommendations (for example, nutritional advice or fitness tips). The City of Vienna is increasingly using electronic media for preventive medicine and thereby also utilizing mobile health services ("mHealth"). One promising option is to explore a game-based approach ("Gamification") in mHealth Apps.[14] Especially for children and young people, playful elements such as high scores and competitions can raise awareness and motivation, which in turn can encourage individuals to lead healthier lives. Through a technological strategy that adheres to and supports the demanding data protection requirements, which are of critical importance with respect to health data, the city can distinguish itself from other commercial solutions.

In collaboration with Viennese health service providers, a new "eHealth" strategy is being devised that takes into account important issues such as mHealth, transparency in the health sector, electronic workflow in the healthcare system, and easier accessibility/searchability of health information.[15]

The City of Vienna supports mHealth projects and initiatives (for example Health Hackathon), as well as start-ups, which are active in the field mHealth.

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[13] Idea 43: Audio information for the visually impaired
Idea 62: Watch with location finder for those with dementia
Idea 64: Support and communication app for elderly people
Idea 89: Mobility support for blind and partially sighted people
Idea 93: Apps for people with limited mobility
Idea 109: Service contact for the elderly
[14] Idea 65: Free Run-App for Vienna as a preventative health measure – that's fun
[15] Idea 68: Aua – where is the next available doctor?
M-116: Collection patient data via patients
Idea 133: Free access to health information
Idea 164: Guide towards medical treatment

I always have my cultural and leisure activities close by[16]

Vienna is characterized by its wide variety of cultural and recreational opportunities, both for the general population but also for the numerous tourists, convention participants and those who travel to Vienna for business. The comprehensive and diverse range of concerts, exhibitions, theatre performances, museums and sporting events, is one of the reasons for the high quality of life in Vienna. In addition, Vienna also has a significant gastronomy and nightlife industry, with excellent restaurants, taverns, bars, clubs and hotels in all price ranges.

The aim is to integrate the cities treasures with the numerous cultural and leisure activities available, by means of an easily accessible technology, and to present them in a clear and understandable manner. Particular attention should be given to Vienna's international standing (multilingualism). The online offer is always available at all times, and helps users find precise information when needed. A well-established web presence combined with mobile solutions ensures a high quality of life for citizens and increased attractiveness for tourists. Open Government Data will play an essential role in this respect.

In its various forms, the offer (a different term is required) will increase the mobile accessibility of cultural and leisure activities in Vienna. Smart digital solutions are favored for event tips (including Push features), that may consist of interactive exchanges (for example, chats forums) relating to various events, a mobile experience via live streaming, and even intelligent references to monuments and buildings ("Digital Signage").

Efficient and sustainable mobility[17]

The Digital Agenda Vienna aims to take into account the full range of technological possibilities that are available, to further strengthen the public transport services, to render the remaining car traffic more environmentally friendly, and to allow citizens to engage in sustainable, individualised energy management.

The well-developed public transport network offered by Wiener Linien, which represents the backbone of Vienna's urban mobility, will be complemented with other publically available services (for example taxi services, car-sharing, car hire, cycling, walking, etc.). These services are key to the integration of digital, eco-friendly offers as a cost-effective and easily accessible alternative to private car usage.

This way the people of the City of Vienna are able to access modern amenities, can contribute to environmental protection, and can personalize their mobility to meet their own needs. Digital infrastructures help support the barrier-free access to all available public transport services. They link the information of urban transport providers, and provide a standardized and open interface across all mobility services, which is freely available to all individuals and companies free of charge. In other words: The aim is to expand the concept of public transport, which includes the

[16] Idea 28: Digitalizing tourism
Idea 130: App for Tourist information
Idea 141: Spare time in Vienna
[17] Idea 103: Environment Ticket for the public transport

Wiener Linien, to encompass the increasingly growing group of publicly available mobility services (car sharing, bike sharing, free floating system, taxi services, etc.). Digital infrastructures play an essential part, in the promotion of accessibility and inclusion.

The following measures aim to strengthen this vision:

- Ticket diversity for public transport[18]: The development of a standardized and managed platform can enable applications (apps) to present, register and manage various digital ticket purchases (especially seasonal tickets offered by Wiener Linien). In response to the increase in real-time information, fault reports and outside partner services (such as museums, car sharing initiatives, public services, etc.), a centralized management can regulate accessibility, to ensure open and fair representation. This way, comprehensive and needs-based services can be provided to citizens and tourists. In the tourism sector, such a Vienna-guiding digital platform can incorporate public transport, information on tourist attractions, as well as the purchase of travel and entry tickets, within a standardized application. This offer represents a supplement to the Vienna Card for tourists.

- Personalized Traffic Information[19]: Following the integrative role of public transport, an online platform with all services (public transport, car sharing, city bikes, etc.) will be available to customers as a "one-stop-shop". For this purpose a central service interface will be created for citizens and applications. This will freely provide open and quality-assured real-time data and fault reports for all public transport services. Especially with regard to the barrier-free access of public transport services, the nature and content of fault information (for example lifts in stations, wheelchair access, etc.) will be collected and managed via citizen participation, and made freely available via Open Government (?). In addition, the design of the service platform should be compatible with ticketing and access systems, so that the content offered can be quickly adapted to the needs of its users.

- Individual transport[20]: In order to facilitate the transition to electric cars (e-mobility), real-time information as well as location, availability and reservation of charging stations will be provided as a service to Viennese citizens. In addition, information on parking space, applicable parking regulations, and the purchase of parking permits and authorizations, particularly in relation to cost transfer facilities on alternative mobility services, will be supported through new innovative solutions.

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[18] Idea 18: Annual ticket, monthly ticket… of the Wiener Linien on your Phone
Idea 22: Wiener Linien Tickets App
Idea 111: Digital Pay&Go tickets
Idea 130: App for Tourist information
Idea 153: Visitor Ticket
[19] Idea 5: Pinpoint Information
Idea 16: Information on other transport lines at transfer stations
Idea 121: Real-time information for ALL Viennese public transport
Idea 148: Transport Information System
[20] Idea 126: Charging Stations Electric Cars

"City of Digital Literacy"

Education and research are key elements in a knowledge-based society. Currently, digital skills are a prerequisite for succeeding in the labor market. A high digital literacy rate presents a significant advantage for Vienna's business role, and is therefore just as important as internationally competitive research, for the purposes of innovation. The City of Vienna is therefore a strong supporter of the expansion of ICT in education and research. The educational institutions of the City of Vienna, such as the Vienna Business Agency and the Vienna Employment Promotion Fund, have put in place numerous initiatives in recent years to address this challenge. The IT equipment in schools has been greatly expanded, and projects such as "Code Studio" by the Business Agency have been initiated to increase digital literacy amongst children.

The City of Vienna is aware of the potential that arises when information and communication technologies, or digitization in general, are provided in the service of education and research. The city aims to intensify these measures to establish digital literacy as a fourth cultural pillar.

If research findings are brought together, and education and research involve individuals of all social groups, better products and more innovative services are produced for all citizens, and solutions to the pressing questions of the future are provided. For this reason, the City of Vienna promotes exchanges between science, business, civil society and government through digital solutions. The City of Vienna is working with all social actors to connect knowledge, to increase the common good and to give citizens the opportunity to understand and shape the digital world in which they live. Networking between actors is also a focal point of the RTI strategy for the City of Vienna.

In this context, the issues of digitization and raising digital literacy will be given a much greater role.

Flagship projects in this field of action are the initiatives "Smart Kids" and the "Code Studio".

Smart Kids[21]

The "Smart Kids" initiative uses (I think a different term is required here) the City of Vienna to increase the digital literacy of pupils in compulsory (I think a different term is required here) schools. Viennese IT companies and the Vienna education server confer basic programming skills, data analysis methods, and digital literacy in general, on compulsory schools.

[21] Idea 92: Enhanced cooperation between teaching, development and research institutions
Idea 46: "Coding" in Schools

At an early age, the pupils are to develop digital literacy skills in a playful way. They will be taught about the exciting opportunities offered by information and communication technologies. They will then be prepared to use these technologies, and be supported in their endeavours.

Within this project, the partners' companies provide interested schools with instructors available from 2015, to pass on their expertise, among other things, in programming. The Vienna education server helps create suitable packages for each grade, and prepares the experts from the business community to work with the pupils. The coordinated workshop offers are continually forwarded from the Vienna education server to the interested schools, so that teachers can easily incorporate IT basics, data understanding and digital competence into their daily lessons. Particular emphasis is to be placed on the issue of women in IT. This is done by special technique workshops in schools, and successful IT experts will give presentations as role models.

Code Studio

In 2014, the Business Agency introduced the pilot project "Code Studio" to playfully invite children and young people into programming. In the pilot phase, 100 children and adolescents first gained programming experience. On the basis of the results, a scientific evaluation of the project, and recommendations by an advisory board, the project can now enter the second phase of development, which will proceed in cooperation with its partners.

IT essentially characterizes the daily life of young people. Children and adolescents/young adults typically act as consumers of communication technologies and mass media content. With the project "Code Studio" children and young people are encouraged to learn that information and communication technologies are not only a way to consume content, but also to create content. Socially disadvantaged youth, children from immigrant backgrounds, and young women in particular, should be targeted.

Thanks to new software solutions, it is possible for children to gain first-hand programming skills in two-hour workshops. Thus, the "Code Studio" allows children to engage in their first programming (coding) experience: Creating their first personal home page and/or their first self-programmed video game will give children and adolescents impetus in entering the world of information and communication technologies.

After carrying out the first pilot phase of this project, the Vienna Business Agency will be jointly developed with partners in the education sector and in non-school youth work, making it accessible to a wider group of children and adolescents.

Key Topics in the Education Sector

Other priorities in this field of action are media competence and training, as well as the facilitation of scientific networking.

Media competence and training[22]

The handling and the creation of digital content has become an important cultural skill that affects all citizens. It is for this reason that course content will be offered for a variety of needs, independent of time and location. The aim is to appeal to all citizens proactively. They should have the opportunity without fear to learn how to use digital media, to better understand and use them for their personal advantage.

This will be ensured by the following measures:

- Earlier and playful approach to IT: For children, the early and playful access to the digital world should be encouraged.[23] To support this, the City of Vienna is promoting the use of digital games and programs. Already in kindergarten children can take their first steps in this direction. This approach is of course not the only method to impart knowledge at this early age, but it serves as a supplement to pre-existing practices. The early placement of digital skills and content is particularly important because not all children have access to same IT equipment. Through an age-appropriate and playful approach with IT, an early promotion of equal opportunities is guaranteed.

- Digital Competence of Teachers[24]: Teachers are proactively informed and trained to develop appropriate pedagogical approaches, and to optimally integrate the provisions of the Internet and of social media into the classroom. To develop this area of expertise, a "Teach the Teacher" approach is offered, in which teachers can work together with their students to acquire new knowledge. Especially when dealing with social media, young people can take on the role as "experts", which should lead to increased motivation and commitment. Conversely, it is important to raise awareness among young people about the risks of using social media. At the same time, teachers are provided with suitable training, serving as an incentive to take advantage of digital media in the classroom.

The end of the Dark Ages of chalk-and-blackboard teaching[25]

The City of Vienna is committed to ensuring that digital teaching and learning methods will become standardized within compulsory schools, so that students can become more receptive, and better prepared for living and working within a digitized environment. For this, teachers should be increasingly equipped with "mobile devices" such as smartphones or tablets. Students should also have the opportunity to use their own private devices in the classroom ("Bring Your Own Device" or "BYOD").

In a pre-defined framework, pupils should be able to freely navigate through IT-based learning methods and choose whether they want to repeat classroom material that they have already taken, deepen their understanding, or even skip certain items. For a better understanding, learning content can be supported via IT, or illustrated with

[22] Idea 40: Missing link
[23] Idea 145: IT-Knowledge as a cultural technique
[24] Idea 98: School
[25] Idea 134: WLAN in School

numerous examples. Thus, a better, personalised learning process can be provided, and the need for private tutoring[26] reduced. Students are also given the opportunity to support themselves and each other through virtual platforms (i.e.: "cloud" platforms). In addition to receiving factual knowledge, the social skills of students are further enhanced. The following point illustrates the possibilities of these virtual communication platforms in more detail.

Virtual space for Teachers-Pupils-Parents[27]

The City of Vienna promotes the mutual exchange of information and experience by teachers, pupils and parents, as part of a virtual communication platform that has been newly created. Via web spaces, forums, portals and Apps, interested parties can communicate amongst and between each other on topics relating to teaching activities and school life. Learning outcomes can easily be made available to all teachers, and shared via the cloud, which can encourage teachers to replicate or adopt particularly successful methods.

Even for parents of kindergarten children, the new technology offers many benefits: Important notices that often hang in lobbies and corridors in kindergarten can be received and managed on virtual communication platforms or apps. Communication between parents and kindergarten teachers – in addition to private consultation hours – will be enhanced.

Promote lifelong learning[28]

Learning does not end at high school: The concept of "lifelong learning" should enable people to acquire knowledge and skills throughout their lives. The City of Vienna is committed to ensuring that all citizens – regardless of educational attainment, age and origin – have the opportunity to participate in digital cultural activity. Through the use of digital communication platforms (digital spaces), appropriate educational content can be provided for all citizens. Citizens with very little IT knowledge are introduced to the new technologies via group-specific services offered by the City of Vienna: For example, special courses are offered to older citizens who have little experience with the possibilities and dangers of the Internet or the latest technological devices such as smartphones or tablets.

[26] Free private tutoring, for example, is not offered in every subject, http://www.wien.gv.at/bildung/schulen/gratis-nachhilfe-ausweitung.html
[27] Idea 135: A Cloudlet per Class within a Vienna School-Cloud
Idea 106: School Portal: End of the Stone Age
Idea 147: Kindergarten APP
[28] Idea 145: IT-Knowledge as a cultural technique
Idea 102: Knowledge-based Society
Idea 98: School
Idea 40: Missing link
Idea 12: Courses for elderly Citizens

Open and freely usable content

The City of Vienna promotes an open curriculum, which can be used and edited by students, teachers and organizations. According to the model of a “creative commons”, it should be possible to re-use and modify information by all users.

Rooms for Creativity

Even outside the virtual world, the City of Vienna provides rooms for mutual creative exchange: In the Viennese districts, there will be meeting places where people can broaden their horizon through personal contact and knowledge sharing. By involving the local “Maker” scene and the development of novelties through the creative help of current technologies, this should stimulate the creative processes and foster innovation. In addition, as part of the “Citizen Science” initiative, citizens at meeting places should be given the opportunity to be actively involved in research projects of Viennese research institutions or to be supported in their own amateur research project.

Büchereien Wien – Vienna Public Libraries

Via the Virtual Library, the Vienna Public Libraries offer access to more than 40,000 eMedia.
The Austria kiosk is free of charge on all user PCs of the Vienna Public Libraries, and can be accessed at internet address: www.kiosk.at. The Austria kiosk refers to the digital newsstand of the Austrian Press Agency (APA), in which a total of 190 Austrian and international daily newspapers, numerous periodicals, magazines and specialised media can be digital read (in PDF format) and enjoyed.
The online newspaper portal Library Press Display allows all customers of the Vienna Public Libraries access to the latest e-paper editions of more than 3,000 international, national and regional newspapers and magazines, from 100 countries, and in 60 languages.
Schools of Vienna can, among other things, download digital educational media for teaching, via Media Wien’s media rentals. The digital services of the Viennese libraries will be further advertised and expanded in future.

Technology in Youth Work

The Vienna Youth Work offers Internet access and infrastructure, and supports young people through easy and informal education programs at over 100 locations throughout the city. Adopting a gender and diversity-oriented approach, the “Digital Gap” will be reduced, and digital literacy will be promoted.
Young people are often referred to as “digitally native” when it comes to using modern technologies such as smart phones. Especially in extracurricular youth work, there are major challenges due to the increasing societal changes, such as an increasing proportion of young people who drop out of the education system.
Together with the Vienna Youth groups (youth centres), the start of a project will be evaluated, while the potential of using technology for youth work in organized workshops, and the Viennese technology scene should be used much more than before. These workshops range from the exploration of the diverse potentials and

risks of the digital world via e-Sports, to Youth Work in Web 2.0 and workshops for the artistic design of mobile videos.

Key Topics in the field of Science and Research

Internationally competitive research and networking in the field of science with all relevant social actors characterize innovative scientific locations. With its research and innovation strategy, the City of Vienna is sending important signals for the future of the research and business location of Vienna, which will benefit from increased ICT research and networking.
The information and communication technologies are already one of the key areas of strength for Vienna's economic and innovative landscape. More than 40 per cent of the funding for operational research and innovation projects, which are managed by the Vienna Business Agency on behalf of the City of Vienna, currently flows into ICTs.

The position as an ICT research site will be further expanded and Vienna will become a "hotspot" for innovative products and services in the digital world. On one hand emphasis will be placed on basic research, and on the other hand interdisciplinary networking will be promoted. Intersections between ICT and humanities as well as the social sciences and economics shall be created and strengthened.

To this effect, the following measures will be implemented:

<u>Intensification of research funding for the digital domain</u>

The support programs of the Vienna Business Agency will be expanded and developed to further accelerate the dynamics of the sector. For example, a new funding program will be initiated for the construction of jointly used research infrastructure, so as to enable cutting-edge research in Vienna, and to create a stable basis for the commercialization of research results.

With the COMET program, the City of Vienna in cooperation with the federal government is funding strategic research collaborations between academia and industry. In 2015 and 2016 there will be a renewed call for tenders for COMET competence centres and projects. The Vienna Business Agency promotes cooperation between science and industry ("consortia") and is committed to the development of joint programs. The City of Vienna actively supports the dynamic developments in the areas of data analytics, ICT in production ("production 4.0") and Technology Experience.

To intensify the promotion of the ICT research location Vienna, the City of Vienna will specifically focus on the so-called "ICT-calls" (funding for ICT research projects), the expansion of the infrastructure program for universities, the talent program "Vienna Research Groups for Young Investigators" as well as the establishment of endowed professorships.

Promoting exchanges between research, ICT industry and the City of Vienna[29]

In the field of applied research, the exchange between the City of Vienna, the ICT industry, and the ICT research will be intensified. Externally funded projects, joint EU projects, as well as bachelor and master theses interested in practical applications are identified and then presented in common forums.

Advancement of scientific communication through new media

Viennese ICT research institutions are making important contributions to lifelong learning: Through the use of new media for the creation of modern knowledge transfer formats, current ICT-knowledge and digital literacy of the general public will be made available. For the needs of various groups (for example for citizens, students, second-chance education, etc.) modern formats such as “MOOCS” (abbr. “Massive Open Online Course”) or “Science Slam” are offered, which also allow greater audiences access to a flexible form of knowledge acquisition.

Excitement for technology and innovation – Funding

The openness of civil society towards new technologies is essential to the City of Vienna becoming a centre of innovation. An innovation-enthusiastic population ensures that pilot-users for new products and services can be found. Only by arousing excitement for science and technology, and kindling curiosity for training programs and studies in these subjects, will a sufficient number of highly qualified professionals emerge to reinforce technology developers and innovation drivers within Vienna.

For this reason, on behalf of the City of Vienna, the Vienna Business Agency will promote private initiatives that intend to break down technology scepticism and increase excitement for science and technology among the general population. Ideally, social and environmental risks associated with technological developments will be addressed here, as well as the economic potential in the emergence of new markets.

[29] Idea 92: Enhanced cooperation between teaching, development and research institutions
Idea 102: Knowledge-based Society

"I like IT – Digital City Vienna"

Approximately 5,700 companies with about 54,000 employees and a gross added value of 5.6 billion euros make up the ICT sector in Vienna. The ICT sector has not only become the most promising and innovative pillar of the Viennese economy, but it also provides the key and cross-sectional technologies for all other sectors and areas of life. In providing citizens with a modern and useful value-added ICT infrastructure, the ICT industry is the driving force of Smart City Vienna – for example in the fields of energy, mobility, health or transport.

With the help of the Vienna Business Agency, the City of Vienna has already sent powerful signals to strengthen the business location. At www.technologieplattform.wirtschaftsagentur.at the Vienna Business Agency operates a technology platform for Viennese innovation drivers. On this site, current projects, finished prototypes, and development expertise "made in Vienna" are presented. The platform also helps in the search for project partners and pilot customers. In addition, the business agency is already a strong service provider for consulting IT companies. ICT experts can inform themselves about appropriate programs and funding opportunities. One focus is the networking of Viennese technology developers, innovative companies, and potential pilot customers, such as the event "Business Meeting".

For the future, the City of Vienna wants to create the right conditions for innovative and successful companies by cooperating closely with the TINA Vienna as a Smart City agency, the local IT industry, and with research institutions. This is to ensure that the ICT business location Vienna remains successful, and is made even more attractive in future. The flagship project in this area of action is:

Digital City Vienna

The "Digital City Vienna" initiative is an independent and non-profit initiative of the City and dedicated ICT companies located in Vienna. Numerous ICT topics are addressed in accordance and coordination with the "Smart City Vienna Framework Strategy of the City of Vienna"[30]. The aim is to take action against the shortage of skilled workers, to support digital competence and excellence, and particularly to inspire and promote women in IT professions. Other important objectives are an acute responsiveness to eruptive technology trends, and the strengthening of economic power in Vienna. An important feature of the initiative is its participatory approach: ideas and collaboration platforms form the basis of an active exchange between experts of research institutions and Viennese citizens. This gives rise to future Smart City Vienna projects.

To draw particular attention to the importance of the ICT sector in Vienna, the "Digital City Vienna" brand will be promoted both nationally and internationally.

[30] https://www.wien.gv.at/stadtentwicklung/projekte/smartcity/rahmenstrategie.html

Further Key Topics

In addition to the implementation of this flagship project, the following priorities are set:

Modern Infrastructure

The availability of ultra-fast access to the Internet has become a central location factor for businesses and for the entire population. A functioning infrastructure (see especially Chapter 6) guaranteeing high bandwidth and enables the interrelation of services, and contributes to economic growth and to the further development of the economy.

The City of Vienna aims to achieve a near full supply of ultra-fast broadband (from 100 Mbit/s) by 2020. In addition to this expansion, Vienna will offer broad Wi-Fi access with 400 hotspots by 2015, in order to make the city's digital public services more readily available on mobile devices, and to be able to offer additional services for tourists.

In addition to developing a Viennese broadband strategy by the end of 2015, Vienna will also swiftly implement new EU Regulations to reduce costs in the deployment of broadband networks. According to these Regulations, new and renovated buildings must have a high-speed-capable broadband infrastructure. In addition, access to the infrastructure must be possible on fair and reasonable conditions. To guarantee this the related infrastructure projects will be coordinated, and the authorization procedures will be simplified. In addition to a change in the Vienna Building Code,

and through adaptations of the housing subsidies criteria, optimal conditions will be created for a basic ICT infrastructure.

Innovative Marketplace[31]

Vienna will establish an ICT marketplace with relevant partners where supply and demand can meet, and Viennese IT companies can present their products and services.

Within the framework of public procurement, the City of Vienna is prepared to adopt new modes of innovative procurement. In this manner, the city will make a significant contribution to strengthening the IT location and preserving the value added in the ICT sector. This adds another point of reference to the objectives and activities of the strategy "Innovative Vienna 2020". Furthermore, Vienna is present in European as well as in national committees for the reform of public procurement law with regard to possibilities of innovative procurements. The targeted promotion of the Viennese start-up scene is playing an essential role.

Innovation meets City

The City of Vienna's public administration and its enterprises represent an extremely attractive and important guiding market for companies developing new products and services. To facilitate an exchange of information between technology developers and potential users within the inner city administration, the Vienna Business Agency has made an overview of innovative Viennese solutions "Made in Vienna" available in the context of the project "WienWin".

The online platform www.technologieplattform.wirtschaftsagentur.at provides a current overview of Viennese product development and prototyping. Innovative solutions are exclusively listed here, whose innovative content independent technical experts have confirmed. In addition, the business agency supports departments and enterprises of the City of Vienna in finding suitable technological solutions for the current challenges ("Usecases") in city administration.

Open Data[32]

The City of Vienna already has an attractive Open Government Data service/provision that is often used. In the future, the existing system will be further developed into a "real time Open Government Data" service/provision. Measures will be taken[33] in combination with the creation of processes and structures, so that the data is available at any time for analysis and management measures in an updated and consistent form ("data governance"). Content and functional enhancements increase the value of the data for the Viennese business and science location. The City of Vienna will also make further statistical data available, such as classification systems

[31] Idea 171: Start-App
[32] Idea 162: http://www.wien.gv.at/stadtplan/
[33] Idea 35: Smart Data – Innovation from Data
Idea 20: Expanding Open Data Offers
Idea 6: Semantic Web Technologies for the Viennese ICT

(thesauri), Vienna registers or the like. The City of Vienna also encourages other data delivery services to offer regulated Opendata.

Through the establishment of a network for data management, Vienna has the potential to excel, and thus assume a leadership role in Europe. The increasing importance of massive data in-/output will play a crucial role. A data management institution, a corresponding cluster, or an Open Data Institute within this field of research, is being examined as a possible starting point.

Innovation-metropolis Vienna

Through the implementation of the Smart City framework strategy, Vienna is to become one of the five largest European research and innovation cities, and is thus to consolidate its position as the preferred headquarters location among other ICT companies in Central and South-eastern Europe. Eruptive trends such as 3D printing, robotics, cyber-physical systems, the Internet of Things and innovative functional materials should be swiftly enforced into site-compatible concepts.

This will be ensured with the following measures:

- Development of the start-up ecosystem in Vienna: Regarding the creation of new, growth-oriented companies that develop innovative products and services and bring them to market, Vienna has exhibited an encouraging dynamism. The Vienna Business Agency supports start-ups by offering individual coaching and support programs, the “Start IP Award” or the day of action “reasons in Vienna”. More than 40 companies and organizations took part in this initiative, which is to be continued and even further expanded as a contribution to Digital City. In cooperation with the Vienna University of Technology and the University of Vienna, the City of Vienna manages the business incubator INiTS. 150 start-ups whose business ideas are based on the latest research results have already been supported by INiTS. These measures should be expanded and intensified in the next few years in cooperation with all the relevant stakeholders (for example, research institutions, industrial enterprises, etc.). In Vienna, a successful and innovative IT start-up scene is to be established and experienced as an independent (?) lifestyle. To this purpose, existing initiatives are to be linked and promoted. The initiative shall be developed in close connection with the existing funding landscape, and an even greater focus will be placed on simplifying the process of establishing new companies. Measures for financing and funding opportunities, as well as in training, are key areas. This way, Vienna is to be developed into a European start-up centre.

- Welcoming Research Centres: The city will actively work to ensure that research centres for internationally renowned IT companies settle in Vienna. As a result, innovation, expertise, internationality and Vienna’s high quality of life will be emphasized and advertised.

- 4.0 Industry and Maker Movement: The manufacturing industry 4.0 and the self-producing “Maker” movement are converging gradually. Its pilot projects aim to test in a playful way the emerging possibilities for collaboration

between makers and industry as part of an interdisciplinary “Digital City Internet of Things Makers Challenge”.

- High Tech Research Forum and High Tech Academy: A “High-Tech Research Forum” is designed to invite local experts of different disciplines to work together on research projects aimed at trend-detection and evaluation of application possibilities for the location Vienna. In addition, it should enable a regular personal exchange in a series of talks. The format of a “High-Tech Academy” is designed to bring the knowledge of leading specialists and experts from all over the world to the City of Vienna. Experts from Viennese companies, university professors and students from high-tech studies or relevant research areas, not only have the opportunity to attend lectures given by international speakers, but can also watch – via a growing digital Knowledge-Hub – video recordings of the presentations and discussions.

Vienna as an innovative IT-Hub

As a result of its geographical location and its extremely high quality of life, Vienna has the best conditions to become an innovative IT powerhouse (“IT Hub”) for start-ups, One Person Companies (EPC), small and medium-sized enterprises (SMEs) and large companies. In Vienna, a virtual IT campus is growing, that understands the importance of information and communication technologies, and their contribution to the Smart City concept. This open forum provides all interested persons an overview of what an ICT location has to offer. In addition, the city of Vienna supports the creation of physical IT locations for networking between ICT companies of all sizes with research and innovation centers as well as project and product creation.

Furthermore, a “business hub”[34] is also being developed, which will strengthen the expertise of the Viennese IT industry. Along value-added chains, cooperation is promoted on the international market. This can lead to new value-added chains and vital ecosystems. International funding programs with proven evaluation and monitoring processes help support the risk management of private funders, and offer investment opportunities in the real economy.
The hub brings together the corporate world and professionally oriented education programs, as well as research and development (R&D). In the private sector, the hub contributes to the development of opportunities and prosperity, keeps entrepreneurs interested in Vienna and raises the profile of the city’s business location. Its industry partners and the city can use the hub to offer rewards for innovative solutions. As a result, the industry partners and the city, provide the hub with access to their infrastructure, contacts and networks, in exchange for financial participation.

Digital Excellence

Education, business, research and technology are the main driving force for innovation. At the heart of a strong business location are highly trained and motivated employees. Therefore, the issue of education is an essential part of the Smart City Vienna Framework Strategy.

[34] Idea 44: Supporting the Startup-Ecosystem

In order to counter the shortage of skilled labour in the ICT sector, the City of Vienna has placed special emphasis on an attractive digital education. The existing, excellent private and public initiatives of the City of Vienna are integrated and made more accessible. The activities will be scaled and should reach a large number of potential employers.

The improvement of the infrastructural conditions in kindergartens, schools and universities is not the only central concern of Digital City Vienna. It must also develop formats for the themes and content of the Smart City Vienna Initiative, which can be used in classrooms.
Generally, the age-appropriate teaching of digital literacy should be included in the curriculum of kindergartens and schools. With an exciting and adequate treatment, this learning content will not only influence the behaviours of children, but also impact on their teachers and parents.

Awareness for the strength of the ICT industry

The ICT industry in Vienna has developed a special dynamic and strength in recent years. Vienna is proud to be a Digital City and has positioned itself prominently. This development should be aggressively communicated throughout Austria, as well as internationally. Through targeted information offers and events, Vienna should become better known as an ICT metropolis and more attractive as a location for new and existing businesses and employees. It is essential that Vienna be prominently visible on the international innovation landscape, via modern, novel means of communication.

Due to the intensive support offered by international oversees experts (“expatriates”), who (temporarily) live and work in Vienna, the city has positioned itself as an attractive location and hub in the heart of Europe. At the same time, Vienna will win over a large number of “ambassadors” who will communicate to the world the high quality of life in our city and the attractiveness of Vienna as a research and innovation center for information and communication technologies.

6. Chapter: Digital Infrastructure

"Foundations for mobile citizens, modern city management and a successful economy"

Smart City Vienna also intends to be an intelligent city. Innovative solutions are devised to safeguard the development and effective, safe use of natural, as well as technical resources in all areas of city life. This is only possible with intensive use of information technology, and applies specifically to the interrelated fields of energy, buildings, mobility, and infrastructure. A substantial contribution to Smart City Vienna is an excellent digital infrastructure, functioning as the "central nervous system" of an intelligent city, where digital democracy is particularly important.

Obvious elements of the basic information and communication technology services of a city are, for example, broadband Internet access or Wi-Fi, as a foundation of digital infrastructure. In addition to these elements, the latest technologies and information technology solutions, such as cloud computing, Big Data, social media technologies and procedures, as well as the Internet of Things, increasingly serve as building blocks for innovative solutions. Standardization and "interoperability", i.e. standardized and open interfaces, are the prerequisites for efficient ICT operation in a networked world.[35]

Only on the basis of a well-functioning digital infrastructure, is it possible to develop a range of services that take care of citizens and take on an "infrastructural function" for the economy. In this regard, the already designed Viennese Citizens Portal will serve as a further expansion of e-government offerings, and provide personalized information and interaction opportunities together with the city management.

Objectives of a modern digital infrastructure for the City of Vienna are:

- Supporting as best as possible the development of digital living and the working environment of the city, in the interests and for the benefit of the citizens and the economy.
- Facilitating the effective and safe use of natural, technical, and human resources.
- Improving the services offered by the city.
- Increasing the attractiveness of the Viennese economic and knowledge centre.
- Strengthening the participation of citizens.
- Ensuring barrier-free access to the services and information offered by the city.

The flagship project in this area of action is:

[35] Idea 78: Smart ICT

Digital Mobility[36]

A modern digital infrastructure is characterized by the development of fast, broadband Internet connections. The city of Vienna aims to provide a near full supply of ultra-fast (wired and mobile) broadband with a bandwidth of 100 Mbit/s – in both directions and with no volume restrictions – by 2020 (see also Chapter 5, "Strong ICT industry"). Until the end of 2015, a broadband strategy will be developed, which will take advantage of broadband funding offered by the federal government. This also includes the establishment of a city-owned broadband infrastructure, which will provide a crisis-proof, independent, and affordable Internet supply. To support the sustainable effectiveness of the Broadband Strategy, a commitment to the installation of empty piping in new buildings, and to other refurbishments will be added to the Vienna Building Code by the end of 2016.

In addition to the expansion of broadband, Vienna will offer 400 hotspots with free Wi-Fi access from 2015. Until mid-2016, a concept will be developed for the further expansion of Wi-Fi hotspots in Vienna, with the target of uniform and low-threshold Internet access. Thus, the digital public services in the public spaces of the city will be made easily available through mobile devices, and an additional service will be provided to tourists. Through the targeted provision of terminals with control systems, tourists' information and infotainment services can also be used without Internet connection. In addition, the availability of Wi-Fi is reinforced in the area of public transport.

Further Key Topics

In addition to the flagship project, the following additional priorities have been set in this field of action:

Vienna Roaming[37]

Citizens of the city, as well as those temporarily residing in Vienna, can conveniently access the services offered by the City of Vienna via a transparent infrastructure. The City of Vienna and its partners provide the necessary infrastructure to enable a safe and unified mobile access to information and services. To this purpose, the existing WLAN infrastructures of various wireless providers are combined into a Vienna-wide WLAN infrastructure ("Vienna roaming"). The operators of each access point

[36] Idea 7: Gigabit City Vienna
Idea 10: Free WLAN
Idea 26: SharePoint Services
Idea 33: WLAN
Idea 43: Free WLAN
Idea 74: Broad WLAN-access for citizens
Idea 127: Expanding broadband networks,
Idea 128: Infrastructure
Idea 132: Missing Internet Bandwidths
Idea 153: Visitor Ticket
Idea 163: Radius and Network Policy Server
Idea 166: Wienenergie Blizznet
[37] Idea 88: Secure WLAN / Vienna ROAMING

undertake the identification of users, and equip each user with a "ticket" with which he/she is identified in the entire infrastructure. Registered users can thereby take advantage of the services of the multiple organizations participating in the Vienna roaming scheme, without having to log in repeatedly. Via a location-based website ("landing page"), it is also possible to provide users with information on each location (for example, information in the hospital).

Energy Management[38]

Smart energy management supports the environmentally friendly use of natural resources. The City of Vienna will make visualization of energy consumption and the energy performance certificate ("GIS layers") available in the city plan.[39] Thus, more environmentally friendly means of energy consumption and value-added services are made available to the citizens and the economy.

This measure facilitates the intelligent and transparent use of energy in a sustainable city, the efficient and sustainable supply of renewable energy, the overall transparency of energy consumption in urban objects, such as transportation, and the transparency of energy performance certificates at house, block and district levels.

Communication[40]

Modern digital infrastructures offer better accessibility, easier communication and improve the protection of citizens in emergency and crisis situations. For this, the City of Vienna has examined the establishment of comprehensive information and communication points ("terminals"), while taking into account customer frequency. Existing systems (for example radio) are to be utilized and, if necessary, adjusted or renewed. The terminals also allow those without Internet access to make use of the city's services.

Cloud Computing[41]

For the effective, economical and environmentally friendly use of information technology resources, the use of safe and modern IT services or technologies, such as cloud computing, are essential. The City of Vienna wants to use the economic and technical possibilities of cloud technologies to support and further develop modern ICT administrative structures and strengthen citizen services. For this, the city will develop a municipal cloud strategy by the end of 2015. A crucial framework condition will be ICT security. In this context, the city of Vienna is planning among other things,

[38] Idea 14: Charging stations for mobile devices
Idea 112: A platform for energy management should be included within the ICT Strategy
[39] Idea 23: Mobile GIS – Application development
[40] Idea 54: Feedback terminal
Idea 58: Selfie-Station
Idea 96: Video station information for tourists and industry
[41] Idea 79: Mobility and Consumerization
Idea 80: Cloud Technology
Idea 123: Stone Age of Public Management
Idea 125: Private Cloud for public management

the design and provision of services to guarantee the secure and trustworthy filing of documents. This can be also be developed in form of a notice-archive with personalized access ("personal electronic document safe").

Standardisation and interoperability

Through standardization and cooperation, ("interoperability") economic and organizational benefits can be derived for the city's administration. This applies both to the city's diverse ICT systems as well as for cooperation with other authorities and the business community. With increasing standardization on one hand and a tight product and platform strategy within the city of Vienna on the other, the ICT operation can be made more efficient. The communication between ICT systems and applications is made easier, while the cooperation between the city's ICT departments is made more flexible.

Through on-going coordination of strategic and operational activities, greater synergies can be exploited between Vienna's ICT departments. This will have a positive impact on business processes, which are designed to add value for the customer. Until the end of 2015, a strategy for interoperability will be developed, which will identify general standardization issues. It also aims to determine a sustainable approach to processing solution-specific strategic and operational issues (for example cloud strategy, BYOT etc.).

"Bring Your Own Technology" (BYOT)

The City of Vienna is working on a "Bring Your Own Technology" strategy (BYOT), which is linked to the current "Bring Your Own Device" strategy (BYOD). Private mobile devices such as laptops, tablets or smartphones should be integrated into the infrastructure of the City of Vienna, while guaranteeing a high-level of security. For this reason, a secure platform will be set up to manage the new equipment. In addition, organizational policies are created to safely govern the terms and conditions of use.

The use of BYOT is possible in the area of municipals administration, health and social sectors as well as schools and other (educational) institutions. A consequence of this strategy will be that users can be offered a greater freedom of choice and that the City of Vienna is better equipped to focus on the personal needs of its employees. Especially in education, BYOT also provides economic and ecological potentials.

New Working Methods[42] - collaborative, flexible, mobile

Modern ICT devices and the latest software technologies (collaboration platforms, etc.) increase work efficiency, provide greater accessibility for clients, enhance the flexibility and improve the cooperation of the employees. Through on-going development and adaptation of the technical workplace equipment, the attractiveness of Vienna as an employer increases.

[42] Idea 71: Efficient, cost-effective Communication
Idea 83: Mobile First
Idea 84: Collaboration

Through the systematic implementation of pilot projects and the testing of new technology and equipment, crucial technological developments can be identified and incorporated into the city. As well as the technological challenge of integrating ICT systems into the City of Vienna, there are also organizational issues (working time models, learning models, models of cooperation etc.) regarding hierarchical structures and personnel management.

ICT-Architecture of the City of Vienna

Through the further development of the ICT architecture in the City of Vienna, technical and organizational requirements can be achieved to introduce new cost-effective citizen services. But changes in the external ICT infrastructure of the City of Vienna and current technological trends, also require further development of the internal ICT architecture.

Until mid-2016 a new formulation of the ICT architecture for the City of Vienna will be developed to includes both hardware and software platforms. A necessary framework cannot solely rest on the principles of the Digital Agenda without creating internal administrative potential and synergies, improving cooperation between ICT departments and utilizing standardization opportunities.

Big Data

“Big Data”, is the name given to the extraction and use of decision-relevant findings from qualitative diverse and differently structured information. Such information is accumulating – especially in cities – in an unprecedented scale. In the future, relevant Big Data analyses should contribute to the City of Vienna’s management decisions and the implementation of the Smart City Vienna.

Until mid-2016, a “Big Data strategy Vienna” will be developed from a previous internal city data warehouse strategy and its related concepts. It is essential that opportunities and risks are considered and a special emphasis is placed on cooperation with research institutions.

High Tech Innovation

Current and innovative ICT trends in areas such as the Internet of Things, robotics, artificial intelligence, cyber-physical systems, quantum computing, ubiquitous computing or pervasive computing, offer great opportunities for the ICT business location Vienna. Their developments have to be closely watched by the City of Vienna and if they are found to be relevant, location compatible concepts need to be implemented in due time.

In this regard, the “Digital City Vienna” planned “High Tech Research Forum” will be used for local experts from different disciplines to work together on research projects to detect new trends and evaluate their possible application for the City of Vienna. Cooperation between government, science and industry will be particularly intensified in this area.

"Coordinating the Central Nervous System of the Smart City Vienna"

"IT Governance" uses management and organizational structures and processes to ensure that the Digital Agenda Vienna can be implemented in a timely manner. The establishment and the orchestration of IT governance fall under the responsibility of the group 'Process Management and ICT Strategy' within the 'Organization and Security' division of the Magistrate. The office works closely with all stakeholders within the city of Vienna and its related enterprises and companies.

The key to a successful implementation of the Digital Agenda Vienna lies with competent coordination between all sides. These currently include those responsible in the ICT services of the magistrate, the enterprises of the city (Vienna Hospital Association, Wiener Wohnen and Wien Kanal), the institutions and companies in the vicinity of Vienna (for example Wiener Stadtwerke) and those in the IT industry as well as interested citizens.

In times of increasing digitalisation, IT-Business-Alignment[43] is an essential part of the city's ICT. This incorporates continued mutual coordination between business divisions and IT on the strategic level (objectives, strategies, plans, portfolio, infrastructure) and on the operational level (routine operations, projects, business processes). It can be further differentiated between structural alignment (organization, structures, processes) and social alignment (communication quality, mutual trust, cross-functional knowledge).

The responsibility to shape and achieve this common approach lies with the Chief Information Officer or (CIO) of the City of Vienna. The Office of the CIO is in charge of the strategic planning and management unit of information and communication technology and aims to enhance the efficiency of the city's process management. The CIO department simultaneously functions as a Think Tank and a driver of innovation, as social and technological trends are observed and then given an impetus for the development of innovative ICT and process management solutions. ICT consolidation and increased cooperation is also promoted between the City of Vienna and its various companies.

In addition to the strategic orientation of the office of the Magistrate, the operational IT of the City of Vienna has to align itself with the principles of the Digital Agenda. This ensures that the contribution of IT, which is offered to the entire city, is further enhanced. By providing solutions to the City of Vienna, IT receives a special responsibility.

In the next few years, the City of Vienna's operational IT will greatly transform to meet the requirements of the era of digitization. Therefore, a focus must be placed on expanding its capabilities and applying an appropriate organizational structure. Another emphasis will be placed on the diversification of employees, both in terms of

[43] Idea 100: Introducing/Deploying new IT-procedures

the relationship between men and women and in the existing age structures. The operational IT industry will continually to use role models (“Industry Best Practices”) to certify relevant standards and thus present itself as a trusted and reliable ICT service provider with a stable performance record in a rapidly transforming environment.

In order for these objectives to be implemented, it is necessary to consolidate ICT in the City of Vienna and entrench a strong desire for cooperation. The aim of consolidation is that the individual ICT departments can focus and specialize themselves on their respective areas, at which they have a comparative advantage, and allow them to achieve the greater added value. Cross-divisional solutions and generally available services should be strengthened and developed on a common platform, while synergies are to be used in the area of maintenance and operation. Finally, technology trends need to be analysed and developed into a joint strategic assessment.