

DIGITAL CHANGE – FAIR AND JUST



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1. FOREWORD

RUDI KASKE



Our aim: Not only a small (new) elite is to profit from the digital transformation but society as a whole.

Even though it may not appear so today, the Internet was not invented by large internet companies but was originally a publicly financed infrastructure. A closed military network was made available to public universities and has grown to become an enormous infrastructure available to previously unimaginably large sections of the population. It has made democratic participation, discussion and networking of knowledge possible in unprecedented forms. At the same time commercialisation has developed rapidly, creating the need for various types of regulation. These contradictions can be found in all aspects of the digital transformation.

New developments must not be used as a pretext to legitimise the erosion of current standards. On the contrary: only if the digital transformation can improve living and working conditions of broad sections of society can it be considered successful.

Our vision could be summarised as follows:

New earnings and gains in productivity and efficiency resulting from the digital transformation **are distributed evenly. Work** performed under changed conditions **ensures people a fair income** and the new “digital employers” **pay fair contributions to public social insurance and health systems. The welfare state is extended, not cut back** to meet new needs and make opportunities accessible to everyone.

Developments that offer more equitable distribution and greater democracy should be **supported** actively. For example, the **potential in the field of education should be maximised** and new

opportunities in open education utilised in order to reduce socially selective mechanisms. At the same time **the issues** posed by **entrepreneurial strategies hidden behind new concepts – with positive connotations** – such as the sharing economy or seemingly innovative employment platforms (key-word: crowdworking) **must be discussed in public. The circumvention of current fiscal, social and working standards must be limited**, as must the discernible **monopolistic tendencies of companies** who base their business models on digital networks, particularly to ensure that innovations are not hindered by market power. It is also a question of fighting to ensure that **employees and consumers retain ownership over their data**, without any disadvantages ensuing to them, and that the economic interests of third parties are clearly identifiable.

Classic questions of distribution are being raised in the digital transformation age, as they have always been. It is an essential task of workers' representation organisations to work towards ensuring that all layers of society benefit from the earnings generated by the digital transformation. A question of importance for the coming discussion is **where classic demands “merely” have to be adapted to the new conditions of the digital world; where it is a question of rethinking the enforceability of current regulations so that they can be implemented in the conditions of the digital world –and in which areas completely new requirements and perspectives have to be developed.**

This paper is intended as a basis for discussion and to encourage future debates. The paper is divided into visions; the “questions” allocated to each vision are intended as a basis for further research and can help our work on special interest groups.

These ideas make no claim to be finalised. **They provide basic content to encourage further discussion.** They are open to discussion.

DIGITAL TRANSFORMATION

How can we make the digital transformation fair?



2. THE FUTURE OF WORK, WORK OF THE FUTURE

Gernot Mitter (paper coordinator), Gerlinde Hauer, Caroline Krammer, Sylvia Kuba, Georg Lahner, Doris Lutz, Hildegard Weinke, Florian Wukovitsch

In view of recent developments, the “digital transformation”, the forthcoming “fourth technological revolution” will have a **significant effect** on the extent and organisation of gainful employment, psychological and physical stress on the working population, organisation and financing of social safety nets and on the role and tasks of workers’ representatives.

Employment systems around the globe are faced with **profound and far-reaching changes**, although the direction, speed and actual extent of these developments cannot be forecast with any certainty.

The “visions” described below about the future of work were elaborated on the basis of the following assumptions:

- **Stable interests and needs in a changing working world:** The forthcoming fourth technological revolution does not affect the basic needs of people who have to earn their living through labour. As stable and secure opportunities for work as possible; working conditions that do not exceed the psychological and physical capacity of employees and that support ongoing personal and professional development; forms of gainful employment are compatible with private and personal interests and the highest possible level of social security for employees and their dependents.
- **Active participation, capitalising on opportunities for good work and placing the factor of distribution in the centre:** The effects of digitisation of the production of goods and the provision of services for people can be influenced through politics – how productivity-related earnings from this technological revolution are distributed is of decisive importance. It is not a question of rejecting and preventing such change, but rather of actively influencing and utilising opportunities for employees.
- **Change as a process – the old will remain side by side with the new:** The “digital transformation” is not coming out of the blue. Therefore workers’ representation must be oriented to familiar forms of organising work, as well as forms that are expected or are already emerging.
- **Transnational business requires transnational representation of the interests of workers:** It will be more difficult to represent the interests of workers or of people who have to earn a living through their own work on a national basis in the future. In view of the increasing concentration of power of disposition over enormous amounts of data in companies with transnational business activities or the acceleration of a global division of labour through platforms, establishing representative structures for workers’ interests that are capable of taking action will be one of the decisive factors for success or failure.
- **Labour and social law alone no longer offers sufficient protection:** Labour and social law as hitherto classic legal disciplines for the protection of workers will have to be supplemented with other legal disciplines; in particular, aspects such as copyright and data protection legislation will have significantly greater relevance than before for policies regarding workers’ representation.

Vision 1:

Comprehensive, international legal framework for gainfully employed persons who are personally and/or economically dependent

How do we address the removal of boundaries in the working world beyond classic contractual limitations and national legal systems?

Assuming that the digital transformation leads to

- new forms of gainful employment at the boundary between employed and self-employed work
- a change in the global division of labour (also linked to carrying out work for clients/employers in other countries) and a
- “segmentation surge” in labour markets and to
- a considerable potential for improvement in the working environment for the gainfully employed (greater autonomy of time, greater selection in the place of work, more opportunities for active participation etc.),

how can the core rights of those in employment (appropriate income, limitation of working hours, health in the workplace, individual and collective participation in decision-making, individual opportunities for development) be extended, protected and enforced?

Vision:

A framework of legal regulations is being created at national and EU level which is establishing appropriate standards of protection in the individual legal disciplines (e.g. in labour and social law, general contract law – GT&Cs – trade law, data protection law, copyright, fiscal law, etc.) for those gainfully employed who are personally and/or economically dependent, and is making these protective standards enforceable in an international context.

The “digital transformation” is already creating a series of new types of gainful employment, which essentially relate to in-time management of resource utilisation in (also virtual) enterprises and to the possibility of centralising monitoring tasks with concomitant decentralisation of performing tasks.¹ They facilitate the availability of human work for companies - essentially in all manifestations described previously – according to narrow operational efficiency criteria and in the vast majority of cases mean

- that entrepreneurial risk switches to those in paid employment (e.g. with zero hours contracts or crowdworking),
- a permanent tightrope walk along the line between dependent and independent employment,
- an enormous increase in flexibility (work content, place of work, working hours, organisation of work),
- the danger of limitations to working hours being removed and a significant erosion in employee protection

and hence encourage the already discernable trend to destandardisation and casualisation of paid employment.

¹ Cf. for example Eurofound (2015), New forms of employment, Publications Office of the EU

At the same time the assignment of gainful employment across national borders is made possible via the Internet as labour market - the enforcement of rights for those in paid employment is becoming even more difficult than it is currently.

The developments made possible by technology and types of work with personal and/or economic dependency **need a legal framework** which ensures employees basic rights (remuneration, recovery periods, occupational health, limitation of time-related availability) and their enforcement in the clearest and simplest manner possible.

This legal framework allows the essentially positive aspects related to new technological opportunities to be utilised and developed for those in paid employment, in particular with regard to active co-determination of work content, place of work and working hours.

“Destandardisation” of paid employment is reflected in the organisation of those in paid employment in trade unions: all those in paid employment are members of the mandatory workers’ representation in Austria.

Questions for research

- A legal and comparative law analysis of new forms of work that are emerging - labour and social law evaluation of new forms of gainful employment (in particular crowdworking, micro jobs, casual work, collaborative work, employee sharing)
- Analysis of opportunities to incorporate “worker-oriented flexibility” in labour law (e.g. right to further training, working at home, switching from full to part-time work and back, etc.)
- Analysis of the opportunities and limits of the right of co-determination in Austria with regard to the expected changes brought about by digitisation in labour relations and the development of options or the need to develop them further
- Analysis of incomes and their development in the digital economy (new types of gainful employment, in relations determined by contracts of work in “digitised companies” incl. economically dependent employees) at a national and international level and determination of courses of action regarding the wages policy of trade unions
- Analysis of developments in the organisation of work (e.g. man-machine-interface) and definition of the conditions necessary to ensure “flexible, self-organised team work according to the situation” instead of the work and rhythm being set by machines in production and the provision of services
- Analysis of possibilities for the re-regulation of labour and service markets, incl. an analysis of legal and political constraints
- Research on digital start-ups centred on workplaces with high quality and security

Legal analysis of the following challenges in the field of crowdworking:

- Applicability of minimum wage requirements under collective bargaining agreements, rights regarding working hours, entitlement to leave and co-determination
- Applicability of the HeimArbG (Home Work Act)
- Actual implementation of CS platforms domiciled abroad
- Need to control content (in acc. with Art. 879 (3) ABGB (Austrian General Civil Code) in prejudicial clauses in the GT&C of CS platforms
- Economic analysis of the business models of CW and employment service platforms

Vision 2:

Social security - adapt benefits, uncouple financing from earned income

Increasing flexibility, new qualification requirements for employees and economic structural change induced by the digital transformation are likely to lead to **greater demands on social insurance benefits, in particular from unemployment insurance contributions**. Together with the expected “uncoupling” of work and the expected further segmentation of the labour market, erosion of the income from social insurance contributions is to be expected.

Therefore the key question is: How can financing, standards of benefits and cover ratio of the social security system be maintained in Austria?

Vision:

A comprehensive social security system based only in part on contributions from earned income, for unemployment, illness and old age must be created which allows those in gainful employment to cope with the increasing challenges to their flexibility. Insurance against the social risks named above must remain based on solidarity and at a level that avoids the risk of poverty.

The digital transformation is expected to bring massive **job losses**, according to some estimates. Others point out that the effects on employment of the looming fourth technological revolution is not dependent on a theoretically possible substitution of human labour with machines, but depends at least as much on developments in the organisation of work. However, all forecast more intensive segmentation of the labour market into a (smaller) segment of employment possibilities with a good income, working conditions and opportunities for development and a (larger) **segment with generally vulnerable employment conditions**.

Furthermore, a high level of **uncertainty** is linked with the Internet as a labour market (for example for employment options such as crowdworking or micro-jobs), whether, and if so who, has to pay contributions to and earn benefits on which basis of assessment and to what extent in order to finance the social security system.

The greater **flexibility of labour relations** which indicates **more unstable employment** and with the difference between classic paid employment and self-employment becoming more blurred, it will become increasingly more difficult to link the amount and length of social security contributions to previous periods of employment.

A social insurance system in combination with financing and benefits linked only to earned income seems to be less well suited to ensure social security for those in gainful employment to the extent necessary in a potentially global labour market with highly flexible forms of employment and employment relationships and with great pressure of competition.

The aim should be to establish a social security system financed in particular from the **value created by the employment of capital** and which does not put fiscal pressure on incomes from paid employment, or only to a small extent. In any case, the level of benefits should guarantee extensive par-

participation in social and cultural life and allow people to maintain their life style or prevent them from falling into poverty.

Questions for research

- Development of alternatives to the current method of financing social security systems (tax on value creation, etc.)
- Development of requirements for welfare state regulations at EU level - volume of benefits, preconditions for claims, equalisation of financing
- Guaranteed employment, minimum wage, basic income: Analysis and evaluation as the basis for developing recommendations/strategies oriented to specific interest groups in view of changes/acceleration of the global segmentation of labour, changes to the Austrian system of employment and increased atypification and more vulnerable employment conditions

Vision 3:

Working hours – shortening and limiting

Key question: **What effects** on the conditions and extent of working hours are expected from the digitisation of production and provision of services? How can the digitisation of production and provision of services be used to organise **working hours in the interests of employees** and how can the political scope for distribution and the expected productivity gains be used **to shorten working hours?**

Vision:

Clear rules for organising work in companies prevent restrictions on working hours from being dismantled and ensure uninterrupted leisure and rest periods. More flexible ways of organising working hours as a result of the digital transformation give employees more autonomy over their time. The current political scope for distribution and the productivity gains achieved through the digital economy result in a clear reduction in working hours and compensatory wages for those in paid employment. The minimum incomes for those in paid employment are regulated collectively at a level which ensures that employees are financially able to enjoy sufficient leisure and rest periods.

The digital economy is expected to bring about a significant **rise in productivity** – estimates talk of up to 30% increases in productivity. At the same time studies and experience show that the digitisation of production and services also poses the risk of dismantling restrictions on working hours – with all the concomitant negative effects on health, social and labour policies.

The expected increases in productivity must be **distributed appropriately between capital and labour**; otherwise we would be threatened with an increase in economically absurd inequalities that endanger social cohesion, and the impoverishment of further sections of the population.

With regard to the social and individual role of paid employment, which remains important, a significant **reduction in working hours** is called for so that as many people as possible can participate in gainful employment.

More equal **distribution** between the sexes of the **volume of work** offered in the domestic labour market is equally imperative. Shorter standard hours for full-time work in combination with more extensive all-day childcare are a suitable approach, as trends in Denmark, Sweden and France show.

The potential for more flexible working hours through the digital economy should be used at all levels to direct the extent and conditions of working hours to the interests of employees.

Policy on working hours as a result of the “digital transformation” appears to be a **significant field of conflict** for the interests of workers in the coming years – how working hours are handled (limitation, conditions, extent) will decide whether the opportunities offered by the digital transformation can be based on “good work” or not.

Questions for research

- Analysis of the effects on working hours of digitisation processes in sectors or at a company level and development of options for “employee-oriented” organisation of flexible working hours and work assignment models
- Synopsis and evaluation of current models/concepts for shorter working hours (national and international)
- Analysis of the positive effects (increases in productivity, positive effects on employment and health, more personal free time, etc.) when working hours were shortened in the past and conclusions that can be inferred for potential shorter working hours in view of the digital transformation
- Analysis of possible political scope for distribution and scope offered by the gains in productivity achieved through digitisation and their implementation in models for shorter working hours

Vision 4:

Security and healthcare for those in paid employment and workers in the digital economy - how work is organised is decisive

The “digitisation” of production and services will bring about significant changes to the demands made on workers. How work is organised in companies will be decisive for the extent and impact of these changes - **how the man-machine relationship is handled** is a decisive factor. Furthermore, the possible removal of restrictions to the place and time of work means new employment protection measures will have to be regulated and implemented.

Therefore the key question is: How can we influence changes in the organisation of work within companies so that possible positive effects of new technologies on the **psychological and physical welfare of employees** can be implemented to the greatest possible extent?

How must occupational health & safety regulations be developed at a national and international level, including monitoring and implementation?

Vision:

Further developing **employee protection laws** at the EU level will mean that changes to the organisation of work in companies can be influenced so that tasks and activities to be performed, work processes and the interaction of employees with each other and with their superiors can be determined with employees' health in mind. Workers' representation at the sectoral level will play a decisive and influential role.

Constant **monitoring** is implemented, at least at the EU level, in order to identify possible **negative changes to the psychological and physical burden** on those in paid employment as a result of the digitisation of production and services and in types of employment independent of place and time from the place of business or from the working hours at that place of business. The results provide the basis for continuous development of legal and practical measures to avoid health hazards.

Clear legal instructions, in particular for new types of employment via intermediary platforms (e.g. crowdworking), state that these platforms bear **responsibility for the occupational health** of workers when performing tasks/activities; appropriate rules to implement such responsibility are established.

Digital production or provision of services has the basic **potential to significantly lower the pressure of work** and hence the negative effects on the health of those in gainful employment. According to relevant research, whether this potential can be increased or whether the potential risks to health & safety innate in the "digitisation of work" will prevail, depends very largely on how work is organised, the tasks involved and social security.

Therefore **employee protection must be developed further to include mandatory evaluation and regulation of work processes**, in particular the interaction between man and machine.

In view of the uncertainties and the expected rapid rate of change, ongoing monitoring of the pressures at work and the effect on employees' health resulting from the implementation of digital technologies – particularly with forms of teleworking – is required as the basis for dynamic development, oriented to processes and organisation, of occupational health in gainful employment.

Questions for research

- Analysis of newly emerging types of employment with regard to the potential psychological and physical risks (e.g. multiplicity of tasks, determining time sequences, man-machine interface, focus on deriving mandatory measures to avoid risks)
- Identification of appropriate procedures and precautions when re-organising work (in particular when determining man-machine interaction) during digitisation phases in companies (case studies)
- Comparative law analysis: Legal possibilities for employees and their representatives to participate in and co-determine the re-organisation of work and the introduction of new technologies (focus on questions of employee protection) in the EU
- Focus groups of employees in new forms (crowd and teleworking, micro jobs) to identify needs and demand regarding occupational health protection (incl. working hours)

- Researching possibilities to raise awareness and inform those in paid employment of the need to observe precautions to protect their health at work and to demand compliance.

Vision 5:

Labour market policy – investing in the abilities and skills of those in paid employment

The successive introduction of the “digital economy” into companies also leads to some fundamental changes in **required skills and abilities of employees**.

Therefore the key question is: How to help employees so that they can deal with these changes in professional skills?

Vision:

The core task of labour market policy is to support those in paid employment to come to terms with dynamically changing requirements for professional or task-related skills and abilities. As part of a comprehensive social security system it also contains measures to maintain employees' psychological and physical performance.

AMS (Labour Market Service) has developed to become the operator of an internet-based, free employment service platform with quality assurance, as well as an agency for professional training and further training or re-training.

Those in paid employment have the right to professional training and further training and re-training. Companies invest significantly more than at present in the development of the professional skills they require - for their current employees, for those in paid employment, contracted by them and financially dependent on them, and for those seeking work.

Estimates of the effects of the digital transformation on employment vary widely: Regarding figures, research forecasts massive job losses through to the assumption that new fields of employment with new opportunities for employment will be created. In terms of quality, new requirements for specialists and further segmentation of the labour market is expected.

It is likely that before 2020 public **employment services** in Austria will be internet-based, focusing on skills. This signals digitisation of public employment services, although advice and support will remain necessary for those who still have problems dealing with these technologies. Nevertheless the current core task of public labour market facilities will be offered mainly via digital channels and not analog. These “employment agencies” will be extended to include “skills placement”, simply in order to present a publicly controlled and influenced alternative to profit-oriented “employment opportunity agencies” (e.g. clickworker in German-speaking countries).

However, the future core task of labour market policy should be to **support those in paid employment with ongoing essential “investments in their manpower”**.

In particular the question of professional **training, further training and re-training** arises, as well as the need for secondary health risk prevention measures in gainful employment.

One particular difficulty is to identify qualifications needed in the future - pertinent studies reveal little useful information.

Possible questions for research:

- Case study: Accompanying the transformation process within a company to “digital business”, with the works council, trade unions and the Public Employment Service (PES) to identify appropriate qualification processes for employees
- Comparative study: Commitment of companies to further training for employees and the labour force in the area during digitisation of their production/services (also for those financially dependent and those seeking work) in selected EU Member States

Courses for action

- Consistent, continued application of the strategy for implementation of an “investive labour market policy” in the committees of the PES
- Development of the opportunity, accessible to those in paid employment within the social security system and endowed with legal rights, to comprehensive professional further and re-training
- Development of an instrument for an active labour market policy in the field of “secondary prevention” based on the experience gathered in the Fit2 Work project

3. EDUCATION, QUALIFICATION AND E-EDUCATION

Kastner Andreas (paper coordinator), Birkner Michael, Leidl-Krapfenbauer Ilse, Sinowatz Lisa

With the potentially unlimited availability of digital knowledge and networking, **education will not automatically lose its selective character**. However, new preconditions for education, professional qualification and the dissemination of knowledge create an enormous democratic potential for comprehensive empowerment to economic, social and cultural action of wide sections of society.

At the same time technological advances will create new divisions due to unequal access to education: a division into those who, thanks to their digital skills, can utilise the gigantic world of digital information for themselves and for social progress as so called “prosumers” and those who are either completely excluded from the digital world of knowledge or who, as consumers supplying data, are at the mercy of the new internet power conglomerates.

Digitisation will affect all aspects of social and economic life. Again, purely analog or manual activities are already being supported by information technology or even replaced by it. At some point, however, almost all activities and sectors will, to some extent at least, be affected by digitisation in the future. Progressive digitisation, global networking and new media require employees, entrepreneurs and consumers to have good digital skills and abilities.

Educating people in digital skills enables people to use digital sources of knowledge, IT facilitators and new digital media and means of communication consciously, responsibly, prudently and in a targeted manner for learning processes, professional qualifications and for private and professional interests. Broad-based and high quality digital education for all members of society is therefore not simply a necessity to create equal opportunities and the possibility of participation, but is also a precondition for further developing science, the economy and society in the interest of all.

Vision 1: Digital education for all

Vision:

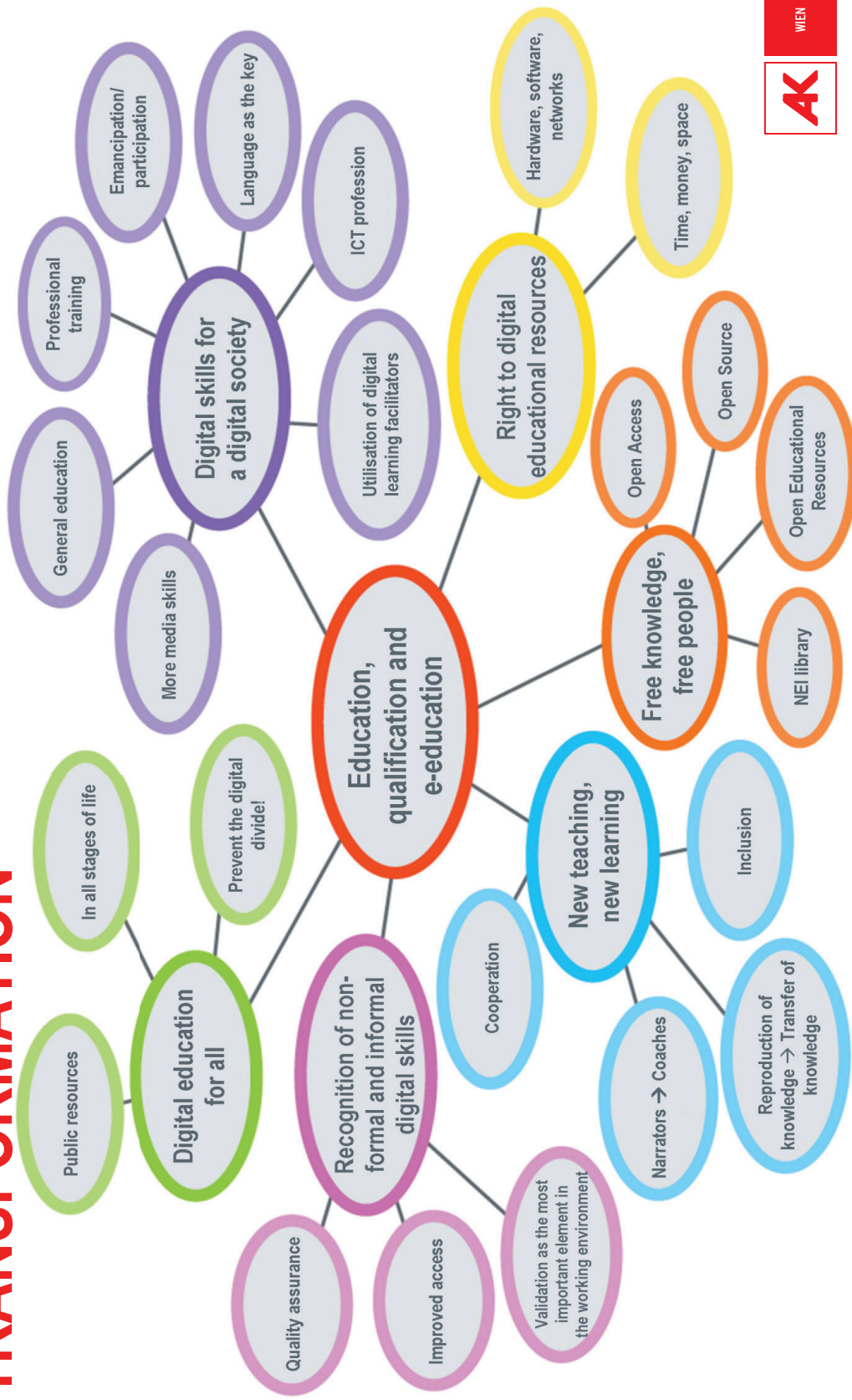
Everyone has the right to acquire digital skills at any stage of life. Public investment in the educational system and the necessary resources prevent a digital divide from emerging.

The digital divide means the **gap in digital education** between sections of the population/classes of society. The hypothesis of a gap in knowledge means that people with a higher socio-economic status and/or higher formal education tend to acquire (and utilise) information more than those with a lower socio-economic status or lower levels of education. This means that the knowledge gap threatens to force the different sections of society ever further apart instead of closing the gap. Digital skills are an essential precondition for active participation in a digitised society and in the labour market.

DIGITAL

TRANSFORMATION

How can we make the digital transformation fair?



Hence the successful acquisition and targeted use of digital information and resources corresponds to new forms of expression of social and cultural capital. The ability to use digital media depends on a wide range of subjective and social factors. In addition to access to the necessary material resources (end devices, infrastructure and networks; see Vision 3) the potential of the individual to take action plays a decisive role.

Not everyone can utilise the opportunities linked to digitisation. In similar fashion to functional illiteracy, many use the Internet frequently without knowing exactly what they are doing – independent of personal characteristics such as age, sex, etc. However, virtual learning also means understanding how information is created on the Internet, how we distribute it or how a search engine works. Only when we have this knowledge can we make a competent assessment of the value of information from the Internet.

Questions for research:

- How can the dynamics of the “digital gap” be recorded and observed? How can we measure threshold values and developments using ongoing research programmes (indicators)?
- How can we use existing statistical data to check where the current digital “line of error” runs? Can aspects of computer literacy/inclusion be incorporated in current canonical questions of social science?
- How are digital skills polled in standardised surveys (e.g. PIAAC)? Which aspects are missing?
- Which factors exacerbate the digital divide and which measures help to close it?
- What are the digital skills of children and young people like, where do we find digital divides and which measures can lessen or prevent the gap?
- What are the core (basic) digital skills necessary for full participation in the digital society? How can these needs be identified?

Vision 2: Digital skills for a digital society

Vision:

Digital education is an ongoing learning process and enables digital emancipation as well as economic and social participation. Digital education and media skills are an integral part of general education and professional training.

The opportunities to participate in economic processes and the future labour market will be highly dependent on access to digital skills. The accelerated pace of intellectual and economic developments results in ever new qualifications being required. **A selective focus on qualifications and special training programmes will only ever be able to close urgent shortages.** Only when all employees acquire **essential ICT skills pre-emptively** will they be prepared for future digitisation phases.

Wide-ranging media skills enable people to use new media and social networks in a personally and socially responsible manner. Information technology is not only a key tool for economic activity but is also a key learning tool. The success of many educational processes will be dependent on **digital skills**. Digital skills will become a key aspect of literacy. An informed approach and the utilisation of IT will be an **integral part of general education and specific professional training programmes**.

A further partial aspect of digital skills is the ability to use digital learning facilitators and the opportunities offered by the Internet to acquire and exchange knowledge and to shape media. The fast expanding number of information channels can rapidly lead to information overkill. It is not simply a question of users being able to sort and identify the source of information (source criticism, focusing) but it is also a question of how well informed they are of their rights and obligations as users. Hence digital skills and a competent approach to new media will be a **necessary part of a thorough basic education**.

The continuing rapid development of the living and working environment determines **life-long learning and qualification processes**. Digital skills are basic preconditions for ongoing further training. The corresponding resources and conditions must be created (Vision 3).

With advancing digitisation the **demand for specialists** to create and maintain the technical infrastructure, software and user support will also grow. The extremely rapid rate of developments for specific requirements regarding IT specialists requires the flexible organisation of syllabuses and teaching practices. The provision of appropriate training, further and re-training courses for IT specialists requires the corresponding capacities to be provided and great **flexibility on the part of training establishments**.

Advanced digital training and professional qualifications for ICT-based activities of so-called **digital immigrants** poses a challenge. Special emphasis must be placed on people with basic difficulties in reading and writing (functional illiteracy). They face the danger of losing their connection to social development and the labour market. In order to maintain social and economic cohesion, low entry-level and largely free courses for adult education and access to resources for digital education are needed (Vision 3).

New communication technologies lead to greater internationalisation of the economy and civil society. This is accompanied by a need for **foreign language qualifications**. English is the omnipresent lingua franca for economic and social exchange in a digital environment. Additional foreign languages and non-German first languages can be used in this networked world as an aid to entry and a bridge-builder for new economic and cultural networking.

Questions for research:

- How can digital skills be integrated in basic skills? Which digital skills are especially important?
- Should digital skills be emphasised explicitly in basic education or taught as an integrative part?
- What role do digital skills play in general education and development of the personality?
- What connection is there between weak reading and writing skills and a lack of digital skills?
- Can aspects of digital skills (regarding methodology and content) be integrated in syllabuses and curricula in the current educational environment?
- How can syllabuses be made flexible so that they can respond to new changes?
- How can the segmentation of access to the teaching of digital skills be prevented?

- Identification of gaps in qualifications in newly digitised sectors, attempts to offer qualifications in these sectors – which sectors are particularly affected by digitisation, how do syllabuses respond to this?
- Which digital skills can be found in training measures in an active labour market policy?
- How firmly established are digital skills in syllabuses and training programmes? Which gaps have to be prevented on a preemptive basis? How can the motivational ability for the independent acquisition of knowledge be strengthened?
- Which best practice examples are available in Austria for the integration of digital skills in an everyday (learning) environment?
- How can educational materials be kept flexible and up to date?
- What need is there for teaching staff to undergo further training? How can teaching staff be trained to deal with digital challenges?

Vision 3: Right to resources for digital training

Vision:

Everyone has the right to access the most important resources for digital training (time, hardware, the Internet, software, learning environment)

The ability to use technology, to understand and hence influence it; the time to be able to learn; the necessary hardware – the corresponding equipment – and access to free software and learning content; all these are important factors so that people can take part in training and advanced training courses in the future.

The digital transformation will essentially promote access to training and the range of training courses offered; however, in view of the increasing polarisation of workers it will be important to give people a **legal right to access to the most important resources for digital training**. People must not be excluded from the digital transformation because of a lack of income, a lower socio-economic status, unstable paid careers (atypical forms of gainful employment, crowdworking, etc.) or the obligation to care for a family member. The necessary hardware must be accessible to all; access to software (see Vision 4) must also be ensured.

Above all, people need time to educate themselves and undergo further training. If people are employed in unstable types of employment to a greater extent, the responsibility for current training and further training will fall increasingly on the individual. Therefore **training periods** (similar to training leave), and a **legal right to them** are needed which people can make use of during their working life. These training periods must go hand-in-hand with ensuring **a means of livelihood**. This must be financed from tax income so as to create as broad a basis as possible for financing, as well as the range of recipients. Teachers and learners need free access to digital learning facilitators and the corresponding digital networks so that they can utilise digital learning opportunities.

Training-on-the-job will increase with greater specialisation; however, here too it is important that learning environments are created for learning processes **during working hours**.

Free access to education and training must continue to be ensured in schools; since **no school fees are levied**, this means that the **use of the corresponding hardware** (laptops, tablets) and **digital learning resources** (esp. the Internet) **must be free** in the digital society.

With increasing differentiation of professions and training and further training courses and greater pressure on people to take responsibility for shaping their careers, training and careers advice centres are needed which help people to plan their training schedules and careers. These facilities should make the technical infrastructure available and help people to take advantage of digital learning opportunities.

Questions for research:

- How can local authorities provide rooms with the appropriate technical infrastructure (e.g. PC workstations, internet access, software, etc.)?
- Which material resources (infrastructure, end devices, etc.) should be provided in public training facilities – and what logistical and financial costs would this imply?
- How can existing tools to secure a livelihood during further training be developed so that a comprehensive legal right to it can be created? Option: Move away from the mindset of social insurance contributions in relation to financing further training (at present largely via unemployment insurance contributions) towards financing through taxes?
- Who should offer training and career advice in the future and what are the requirements regarding content and equipment for these facilities?
- Who will bear the costs for digital learning facilitators in the various training facilities?
- How will access to adult education change with digital training?
- What importance does digital training have in the dual education system, especially in companies as learning environments?
- Should people have a right to access digital hardware or to the hardware itself?
- Opportunities and risks of exclusion of the BYOD approach (bring your own device) in the various training institutions?

Vision 4:

Free knowledge for free people

Vision:

Information and software will be freely available in the future for everyone. Open Access and Open Source have established themselves in the world of training and software development. Open data can be modified and developed further, thus creating new open knowledge, acting as a trigger for social and economic development. Fundamental needs such as data protection are ensured.

Open access to information, and hence to education, is already on the march and will establish itself even more in the future. Above all **knowledge created in institutions financed by public funds** – such as universities – should be **freely available to the public**. People have a **right to access knowledge, the creation of which was made possible by the taxes they have paid**. In technical terms access independent of place and time to this information is already possible. However, numerous learning opportunities and information sources are only available offline, or there are obstacles to accessing them. However, numerous learning opportunities and information sources are only available offline or there are obstacles to accessing them. The large media groups have already identified the field of digital learning and are investing massively in all-in-one solutions for schools and universities. However, in addition to many positive and innovative approaches, profit-oriented companies are gaining questionable control over learning platforms, syllabuses and personal data of learners.

The use of open licences, as offered by Creative Commons, for example the processing, re-utilisation and creation of new knowledge, can be safeguarded for the benefit of the whole population. Access to information and learning opportunities should not be subject to commercial interests alone, but should be visible without limitations in the World Wide Web.

Open source programs such as Linux, Open Office and GIMP prove that expensive and proprietary computer programs – i.e. created by commercial companies – are no longer necessary to view and process all types of information. The spread and availability of open source software will continue to progress and will be continually developed by a growing community of interested people with programming skills and who can find the knowledge they need in freely available documentation. It will be thanks to the availability of open source software that people from less privileged social groups will be able to educate themselves. At the same time we must ensure that designing open source software and open access projects is not limited to a small group of highly qualified programmers. Commercial networks and software systems must be designed so that open applications and add-ons are still possible.

If some people cannot afford the required hardware (computer, tablet, e-reader), they can be used free of charge in public educational facilities such as libraries. The high level of public financing for educational measures and materials (e.g. schoolbooks campaign, public universities, Public Employment Service courses) needed for the digital age demands public, not-for-profit access to knowledge. **Open educational resources** (OER), i.e. free access to learning software and digital teaching aids with open licences, are an important prerequisite for a fairer educational system as well as providing an opportunity for innovative teaching and up-to-date training. Other open educational sources such as MOOCs (Massive Open Online Courses) can help with this expansion of education. Open access and open source pave the way to free access to, and the democratisation of, education.

In addition to these important principles for an open and transparent information and education society, free access to data and databases (open data) is becoming increasingly important. It can be seen as an essential prerequisite for research and co-determination. The field of open government data (statistics, traffic data, data on public institutions, results of elections, etc.) is already contributing to the emancipation of citizens, from receivers of information to users of information. Numerous applications that could only develop on the basis of freely available public data prove the point. It is imperative that personality rights and data protection must be complied with.

Questions for research:

- Which (legal) prerequisites must be created in order to promote open access, open source and open data but without affecting personality rights?
- How can (public) institutions that create knowledge be encouraged to make it available for free?
- What models are available to promote a comprehensive expansion of OER?
- What should a comprehensive OER strategy look like or how should it be developed?
- How can open educational resources be incorporated in the schoolbooks campaign?
- How can educational facilities be supported so that they provide people from less privileged backgrounds with access to knowledge?
- What role is played by open access and open data in innovation and research? How can their effect be measured?
- What strategies are media groups and publishing houses pursuing in the commodification of learning content and facilities? How can public primacy be secured with a digital infrastructure vis-à-vis e-learning platforms and teaching materials for schools?
- What data protection issues or gaps result when proprietary learning software or software systems are used in educational establishments? Key word: e-classroom register and networked learning processes.

Vision 5:

New teaching and learning through digital training

Vision:

Digitisation makes learning more cooperative and inclusive. Students lose their headstart in knowledge and their “narrator” role. They become training coaches and by evaluating learning data they can address pedagogical needs on an individual basis.

Digitisation of the sources of knowledge and networking opportunities for students and learning materials change the shape of lessons. Access to sources of knowledge such as teachers and books is no longer linked to a particular time or place. Lectures, graphical material and texts can be downloaded at any time and in a place chosen by the student. Current forms of transmitting, checking and creating knowledge will change markedly.

Simply transmitting knowledge will break free of the institutional framework of schools, universities or adult education facilities. Resources that were previously used for the annual repetition of the unchanging head-on transmission of knowledge can be used to supervise and accompany learning processes. Teachers and lecturers become supportive “**training coaches**”. This approach of a “**flipped classroom**” or “**blended learning**” is already being implemented in many educational establishments. At the same time the reproduction of knowledge in the form of repetitive homework and the reproduction of encyclopaedic knowledge becomes less important if knowledge can be copied, transmitted and downloaded digitally at any time by students. Reflecting on and applying knowledge will stand at the core of educational endeavours.

The digital availability of knowledge and permanent networking in social networks in order to design tests of students' achievements will play an important role. At the same time the possibility to record and communicate using modern devices poses a great problem when **devising examinations and tests**. However, the erosion of traditional surveillance methods also offers the **opportunity**, in the sense of identifying skills, **to focus more on abilities and skills in variable situations**.

Digitised learning processes will bring about change in all areas of education. Nurseries, schools, universities and adult education will be affected to different degrees and will develop different types of access to digital educational processes. Therefore the core element of state and public action must be to adapt **general conditions and infrastructure** in educational establishments so that new forms of learning can realise their full potential. Uncoupling the transfer of knowledge from a lecture or access to certain books offers great opportunities for education to expand. In particular **students in adult education** will be able to benefit since they frequently **lack the time to attend in-class lessons**. However, new technologies and communication offer greater potential for the creation of knowledge and **documentation of learning processes**. With the corresponding technical and pedagogical support, students are able to **cooperate** to provide new educational resources and sources of knowledge which in turn can be disseminated and used by others. Previous tests based on individuals' achievements can be supplemented with measurements of cooperative skills. Positive experience gained from students' own and shared productivity and creativity will create the basis to actively shape the digital knowledge society and economy.

Decisions on education and didactic shaping of learning processes will be supported in the future by the acquisition and evaluation of learning data. This offers the opportunity to address individual students' needs in a more targeted manner. At the same time strategies to maintain data sovereignty and data protection of students or their parents must be developed and implemented rapidly. However, educational data can only provide suggestions and the basis for decisions: the primacy of students and teachers must be maintained vis-à-vis educational decisions based on data.

Numerous pilot projects and highly advanced digital learning cultures in individual educational establishments can be used as models. The challenge in terms of equal opportunity is therefore to ensure participation of wide sections of society in digitally aided educational processes and establish **beacons as a widespread standard** for nurseries, schools, universities and adult education. Teaching staff must be competent, through their training and qualifications, to use new media and technologies in a targeted and professional manner. They need rooms and technical infrastructure to do so. By this is meant in particular the corresponding hardware: networks, internet access independent of location and devices to accompany the learning process such as tablets, computers, beamers or whiteboards, as well as the corresponding software for collaborative work. In order to keep licensing costs as low as possible for the public purse, **a basic stock of licence-free learning and working software must be made available to all public educational establishments**. Teaching and learning materials are an important incentive for the implementation of innovative digital methods of importing knowledge. Open educational resources (OER see Vision 4) are an important prerequisite to equal access to new forms of learning.

Digital devices to accompany learning allow people with different learning and cognition levels to be catered for. Content and tasks can be absorbed, processed and reproduced using the various senses and using different methods of representation. Individualised learning materials (e.g. course or school-book on demand and OER) allow students to set specific focal points and cater for students with different learning speeds and needs. Digital education can realise its full potential by compensating for impaired senses and those with special needs. Hence digital support for learning processes can be an important building block for inclusive teaching practice and training.

Questions for research:

- How are digitally supported learning processes accepted? What are the differences to classic formats?
- What basic knowledge is needed to ensure students can use digital sources of knowledge competently?
- What technical infrastructure is available to teachers and students in the various educational establishments?
- What technical support do teachers need in educational establishments?
- To what extent does educational architecture (design of classrooms) allow for changing requirements?
- What potential is there for improved cooperation regarding learning locations between vocational schools and companies within the dual education system?
- How can we ensure that new learning methods do not merely result in outsourcing the communication of knowledge within the dual education system, for example by establishing the acquisition of self-taught course material outside in-house training hours?
- What resources are displaced by “flipped classrooms” with the reversal of relaying and testing knowledge? What potential is there for expanding education by digitally processing sequences for relaying knowledge?
- How can schoolbooks be individualised? What is flexible schoolbook approval like? How will the business model for publishers of schoolbooks be changed by OER and book-on-demand?
- To what extent are the new strategies for relaying knowledge and capacities already incorporated in teacher training?
- To what extent are opportunities for expanding education and facilitating access already being made use of?
- How can cooperative skills be emphasised in curricula?
- How can a sensible test of students’ achievements be implemented based on the assumption of the availability of knowledge in digital form and technical means of communication during examinations and tests?
- What data should be collected by the educational establishment? Which rights of disposal do students or their parents have over learning data?
- How can the opportunities of data-based decisions on education and pedagogical planning be utilised through data anonymisation without infringing on the data protection rights of students?
- What access do students with special needs have to digital learning facilitators?
- How can digital and networked learning be used to reinforce the inclusion of different types of learners?

Vision 6:

Recognition of non-formal and informal digital skills

Vision:

Digitisation offers more people access to education and promotes the recognition of non-formal and informal learning processes

The digital transformation will accelerate learning processes; new content will enter training and further training programmes; however, new professions and hence new training courses will also emerge. Since specialised, but also interdisciplinary, knowledge continues to gain in importance, firstly we need **modular educational blocks** which people can acquire where they are (they no longer have to complete the full training programme if parts of the training programme have already been acquired in a non-formal/informal manner and have been recognised formally) and secondly learning on the job (applied knowledge) will gain in importance. However, it must be ensured that this knowledge is recognised and **attested formally**. The recognition of skills acquired non-formally and informally is an essential element in influencing the digital transformation positively to the benefit of employees.

Massive Open Online Courses, online lectures, video tutorials and other digital learning methods are an opportunity to widen access to education and advanced professional training. This enables people who are currently largely excluded from further training to be reached in increasing numbers (people with low formal qualifications, job seekers); however, this requires them to have the necessary digital skills and the ability to implement learning processes themselves (see Vision 2). Many will need support. It will be important to ensure the quality of courses offered – course material should not become “arbitrary” since it is “freely available”; the **quality must be assured** and incorporated in a formal qualification process if necessary.

With advancing digitisation in ever more sectors and fields of work, conveying and recognising digital skills is gaining in importance in an active labour market policy and employment mediation. Both digital educational content and digital forms of learning will become more prevalent among the offers of an **active labour market policy**, increasing the options for learning for more job seekers.

In the future it will be much more important for people to be flexible in the labour market (between different types of gainful employment): empowerment and advice for job seekers with the aim of planning and shaping their working life alongside their individual way of life and current conditions. This includes the provision of online information as well as longer-term case management or coaching. An investive education and labour market policy is needed: in view of expected developments, greater value must be placed on education in labour market policy; education (which must not necessarily be related to a profession) increases the chances of negotiating one's way in a digitised world.

Objectives:

- How can we ensure that new skills are integrated in formal (partial) qualifications and attested training and further training courses?
- How can skills acquired in a non-formal manner (i.e. also e-skills) be validated – or formalised – in the future? What are the limits in relation to the validation and recognition of these skills; what can be formalised or integrated with a qualification framework and which skills cannot be integrated appropriately?
- How can the quality of non-formal and IT-based courses be ensured?
- How can knowledge acquired on the job (i.e. informally) be attested?
- How can we help people, who were hitherto largely excluded from education or training, to acquire qualifications?

4. FUNDAMENTAL SOCIAL QUESTIONS

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Vision 1:

Distribution of gains in productivity and efficiency

Vision:

Newly created income, productivity and efficiency gains resulting from the digital transformation must be distributed fairly. Work performed in the new digital working world ensures people a fair income and the new digital employers pay their contributions to the public social insurance and health systems.

In order to ensure that all sections of society and society as a whole can benefit from the positive opportunities of the digital transformation, developments that ensure **more equitable distribution and democracy** will be supported. At the same time **the problems** posed by **entrepreneurial strategies** hidden behind new concepts – with positive connotations – such as the “sharing economy” or seemingly innovative employment platforms, **must be discussed** publicly and it must be ensured that those who profit from them pay a fair contribution. **The circumvention of current fiscal, social and working standards** must be checked. **Monopolistic** tendencies are discernible in the field of new digital companies (both in the sharing economy as well as in other platforms). It is all the more important to enforce equitable fiscal and social insurance contributions and ensure that innovations are not blocked by market power. Classic questions of distribution are being raised in the digital transformation age, as they have always been. An important task of workers’ representation will be to work towards ensuring that all sections of society can benefit from the gains from the digital transformation and that all can make use of the potential it offers.

Further questions and challenges:

- What new challenges will arise when combatting tax fraud by global internet companies at a national and European level? What models are available (or what models have already been tested in practice by other countries) in order to ensure they pay a fair contribution?
- How can positive developments of the digital transformation that offer more equitable distribution and greater democracy be supported (e.g. with regard to access to knowledge)?
- Discursive limitation and clarification of entrepreneurial strategies that create a business model under the pretext of digital innovations largely based on the avoidance of fiscal and labour law standards (pseudo-sharing).

4.1. Old battles in new uniforms: Private v. state sector in the digital transformation

The digital transformation redefines private and public areas; as a result the divisions between the private and the public sphere are shifting in a great many aspects of life. In the public sphere, new sender-receiver relationships are emerging; a spatial public sphere stands side by side with a virtual spatial public sphere. The institutional and political public sphere is being confronted with demands for participation and transparency; digital technologies are creating space for a new social “ad hoc public sphere”.²

Vision 2:

Boundary between the private and public sphere

Vision:

This coexistence of the private and public spheres will continue in the digital domain and there will be clear divisions between the various digital public spheres. These public spaces will be networked and/or separated by users themselves. There is agreement that privacy and the private sphere are based on the concepts of dignity and self-determination.

However, the creation of new public spheres, **a shifting of the boundary between private and public spaces**, necessarily means changes to private spaces and the category “private”. Different interests are already creating different ideas of what is private; for example large IT companies argue that an invasion of privacy can only occur when private data of other people can be viewed. Since data are only processed using algorithms and individuals can only work with aggregated results at best, such an invasion cannot come about.

Another problem is the **lack of understanding** of how some sales models operate. Some services are based on consumers making their own data available; others are based on participants allowing access to personal data in their own network.

Public and private spheres are not naturally occurring categories, but are concepts determined by society. Therefore they are permanently available for assigning a definition to and cannot be definitively discussed. Current examples for **debates focusing on interests** are the discussion about accessing accounts or the discussion about handling companies’ commercial data. And not least the “task of privacy” is also exploited financially. The use of **social media** is only free at first glance: consumers do receive a benefit; however, in doing so they may cede personal data to companies.

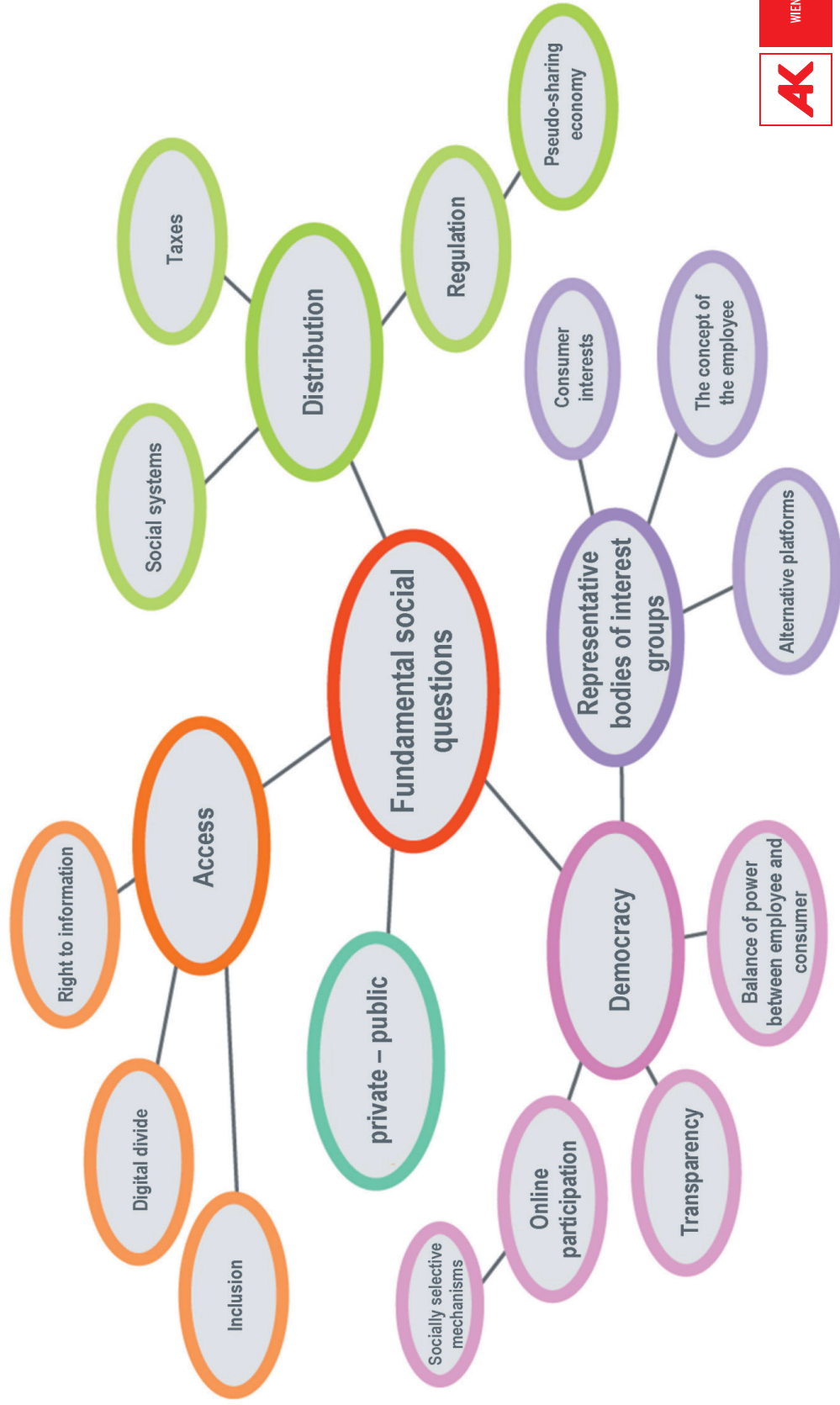
Further questions:

- When (and for what benefit) are consumers prepared to “sell” their personal information online or to use it as a currency (e.g. to secure discounts or for certain additional digital benefits)?
- Where does a violation of the integrity of the private sphere begin? What definitions of public and private do we need in order to maintain legitimate private spheres while guaranteeing the (future)

² www.collaboratory.de/w/Öffentlichkeit, downloaded on 22.7.2015

DIGITAL TRANSFORMATION

How can we make the digital transformation fair?



continuation of necessary public institutions? How can we create and support awareness and self-determination in our approach to different private spheres and public spheres (whoever, for example, talks about their political views in one social media should not automatically do so in another)?

Vision 3:

Preventing employers and employees from retreating from regulated areas

Vision:

A policy representing employee's interests and encouraging solidarity prevents employers and corporates from retreating from regulated areas for certain services.

The public and private spheres are a **contradictory pair** which exists in the field of technology and digital development in addition to many other contradictions. Digital technologies make teleworking possible – but they can also demand it under certain circumstances. They satisfy needs – and create new ones. They open up new opportunities while limiting personal space. However, growing opportunities create new private spaces and markets (key word: sharing economy, bionic medical technology, etc.) beyond the scope of current **regulations**.

In many areas the public institution of law is lagging behind actual technical developments. Mediation platforms and “innovative” companies are retreating from regulated areas. Labour law, fiscal law and environmental law are examples of “areas of retreat”. For example, large internet companies are currently under investigation by the European Commission for their tax avoidance practices. Labour law is increasingly being flouted in the growing number of crowdworking and employment service platforms by referring to their GT&Cs. A possible counter-strategy comprises the creation of **new supervisory authorities and new legal instruments to maintain and expand our system of solidarity**.

Further questions:

- Under what conditions and with what objectives do companies retreat from regulated areas to new digital markets? When do new employment mediators still call themselves “employers”, when do they call themselves “facilitators”, when “providers” and when simply “technical operators”? Where do they try to circumvent labour law through their GT&Cs? What implications does this have for the institutional public sphere?
- How can we prevent business from using language to influence awareness and so achieve sovereignty of discourse, as it succeeded in doing during the neoliberal revolution? The concepts of “public” and “private” in particular entail the risk of double-speak (for example, “private” can be looked at from the aspect of individual human/citizens’ rights in connection with data protection issues, while in relation to ownership it has another meaning for workers’ interests).

4.2. Access and obstacles to the digital world

The Internet has become a core infrastructure in the political, media and now also the economic sphere and access to it is a **precondition for participation in society**.

Despite the massive expansion of internet use, some people are faced with the risk of being excluded from the digital world. Society is also divided in digital terms into those who utilise the digital world and take an active part in it and those who – irrespective of their reasons – do not participate (cannot or will not). Between these two is a social group at risk of relegation or exclusion or driven by the fear of it.

This **digital divide** runs along different separating lines, e.g.:

- **Exhibitionists and introverts:** Not all are prepared to waive protection of their personal data as is currently demanded for many offers on the Internet.
- **Experts and lay people:** Skills in managing and accessing new media are unevenly distributed. Frequently factors such as education, age, family background, income play a role.
- **Old hands and newcomers:** With stricter surveillance of copyright, especially with established providers, the risks of active provision of content by newcomers has risen significantly. Established companies try to keep competitors out of the Internet through the strategic violation of standards.
- **Haves and have-nots:** The material prerequisites such as an internet connection and the necessary hardware are not generally provided. With commercialisation the pressure is increasing to charge for making part of the content available.
- **Prosumers and consumers:** Prosumers are consumers who create content themselves and share it in cyberspace (e.g. users of Wikipedia who write contributions themselves). In contrast, there are users who primarily consume the content and information from others.

Vision 4: The right to information

Vision:

Employees, consumers and citizens have the right to information - independent of their income, social status, disability, geographical location, health, age or sex. Available information is free for all. Conveying media skills, i.e. the knowledge of how to handle this information, is a key social task of education.

Individual media skills: The ability to manage digital media varies and creates a gap. Similar to functional illiteracy, many people use the Internet – independent of age or education. However, they seldom understand exactly what they are doing. Digital media skills and their potential consequences are increasingly becoming a cultural skill. Virtual learning also means understanding how information is created on the Internet, how we distribute it or how search engines work. Only when we have this knowledge can we make a personal assessment of the value of information from the Internet.

The possibility of using, generating and disseminating information via the Internet allows a variety of content to be created. It is precisely the number of information channels³ that can rapidly lead to **information pollution**, or an excess of information, which also gives rise to questions of copyright. It is not only a question of “what can the user do” but also a question of what s/he thinks s/he may or may not do. Large media companies generally find it easier to embed their view of the right behaviour both in actual terms as well as in the minds of people.

³ Antonio Casilli

It is already possible on the Internet to differentiate between valid uncommented and reinterpreted information from interpreted information through identification via the address (URL). Addressing factual information is done via the (top) level domain ending in “edu” or “gv”, public records are accessible for all (Parliament, legislation). Platforms are networked together. Legal notices are mandatory. Information provided in the public sphere such as programmes of public corporation radio must also be made available online without restrictions.

Access to hardware and software However, barriers and obstacles in the digital world can equally be of a technical or material nature. If the technical infrastructure or the equipment is missing, or simply if there is no reception, people will be excluded from its use even if they are willing. Software and licences often represent high costs, whether for PCs, from the Internet of Things, or when using applications. Currently basic functionalities of products (apps) can often only be used to a limited extent or not at all if there are no freeware solutions available, which frequently contain advertisements. The classic examples are Windows/Apple vs. Ubuntu or Microsoft Office vs. OpenOffice.

A variety of approaches are already in use, for example public **WLAN points** or free access to the Internet in libraries. A possible approach would also be a certain **bandwidth with free data packets**. Public offices and schools should use **open source software** whenever possible. Schools in particular currently allow themselves to be roped in without payment to tie future users to the products of a few large producers by only training students with these products.

Further questions:

- Who is capable of participating in the digital world and who will be excluded?
- What skills are needed to be able to manage in a highly digitised world?
- How can users be helped to differentiate between “valuable”, uncommented and valid information and information that has already been interpreted?
- How can users be guaranteed access to information technologies?

Conventions for online publication of official information

It is the responsibility of public authorities to inform legal representatives of interest groups of the introduction of industrial installation approval procedures or to specifically ask for their opinions regarding drafts of public planning documents.

An online announcement, for example on the website of the relevant public authority, significantly increases the risk of being overlooked and in this way favours players whose informal channels of information to the relevant authority are better established.

Even if things are announced online, the question remains: how? The most recent example is the Störfallinformationsverordnung (Hazardous Incident Information Regulation): Companies posing a risk must post information on the Internet about what to do in the case of an incident. However, the question arises of how helpful such information policies actually are if a serious incident occurs. In short: we need a convention that can be seen as good practice.

A further question:

- What should mandatory rules for the publication of official information look like?

Vision 5: Right to use without risk

Vision:

Everyone should be able to use the Internet without immediately running the risk of coming into conflict with legal provisions.

Normal internet behaviour and transmitting information often come up against legal barriers which many are not aware of and which entail debates about copyright, if nothing else. In this case it is not only a question - as mentioned above - of what users may do, but also of what they think they may (or may not) do. Of course certain limitations are needed, in particular against bullying, mobbing and various crimes that cannot be tolerated on the Internet either. Nevertheless legal regulations (especially regarding copyright) may not lead to barriers being constructed so that users stop using the Internet or are even prosecuted or served a warning by lawyers. The legal system must be adapted to reconcile these diverse interests. The principles of **fair use** and simple, clear rules for everyone must help to create trust and to ensure that normal users do not unwittingly violate legal regulations when using the Internet.

Further questions:

- What instruments are needed to prevent misuse of legal enforcement by employees by threatening legal action or similar?
- How can users be better informed of actual rights of use?
- What regulations are needed in order to give lawful users the confidence that they are behaving in a permitted manner and to avoid ambiguities in a future legal interpretation?
- What effects can/should these developments have on copyright?

Vision 6: Right to high-quality infrastructure

Vision:

Everyone has the right to high-quality infrastructure.

A high-quality **infrastructure** is the basis for using services in the information society. Infrastructure expansion is generally done by private companies who follow the rules of a market economy. This results in a difference between agglomerations that are well served and badly served peripheral regions. But it is precisely the remote regions that could benefit more from a good connection. The government is called on particularly here to ensure that a good internet connection is available to everyone **everywhere**. Therefore, in the digital world it is essential to compensate for the inadequate service in remote regions by state action and to initiate the expansion of infrastructure where insufficient provision due to market forces would prevail. Greater recourse should be had to funds to promote the development of rural areas.

Further questions:

- How can we ensure that social barriers to access in agglomerations are removed with the same level of intensity as obstacles to access determined by region?
- How can we ensure that people living in peripheral regions, who benefit from lower living costs, make an appropriate contribution to the expansion and maintenance of the infrastructure?

Vision 7:

Freedom of decision regarding participation in the digital transformation

Vision:

Independent of income, social status, disability, geographical location, state of health, age, sex or sexual orientation: everyone has the freedom to decide whether or to what extent they want to participate in the digital world.

Not everyone is prepared to trust technology. Not everyone wants to waive protection over their personal data and not everyone wants to participate in the digital world - irrespective of the degree.

Information must be freely available to all. Even those who do not want to participate in the digital world have the right not to do so and they should not suffer any **disadvantages** from this. All information, irrespective of the type, should always be available in analog form whenever possible.

Further questions:

- What differences in hierarchy and power constellations are there in the digital world? What effect do these structures have on disadvantaged people and how can we create a balance of power?
- What conditions can help users to influence more how their personal data are handled?
- How can the emancipation of users be promoted by the large media monopolies?
- How can we ensure that advances in emancipation are made in significant parts of the process of conveying knowledge and also in unregulated online media companies?

4.3. Organisations representing employees and consumers

Employment relations are changing increasingly with technological developments and new forms of work are emerging. This means that the justified claim of employees to fair wages, good working conditions, co-determination at work and social security is often not satisfied. Workers' representatives have to respond to these changes. Digitisation offers consumers an increasing number of opportunities for co-determination and participation; however, this can also pose risks. Firstly, previously paid employment is being outsourced to consumers, thus endangering jobs. Secondly, the commercialisation of sharing is creating numerous legal grey areas. Non-transparency of information and cases of fraud cause massive harm to individuals. Upholding the rights of individual consumers is becoming increasingly difficult.

Vision 8:

The employee and employee protection under labour law

Vision:

Employees in new forms of wage labour come under the concept of employee. They are covered by the protective clauses of labour law, including social security. Their interests are represented by workers' and employees' representative organisations.

For years now the number of **“atypical work contracts”** such as marginal employment or agency work has been increasing rapidly. Other (global) forms of work (crowdworking, casual work, portfolio work) are now being added due to the digital transformation. These types of work, which are frequently performed by the worker at home, have traditionally had a large percentage of women, often because they see it as an opportunity to combine work and family. Some of these forms are based on freelance work (new freelancers) or on **pseudo-freelancing or contract work** and are not covered by labour law. However, the erosion of the protective regulations of labour law and co-determination at work should be prevented by the rising number of employees with fee-based contracts or doing contract work and who are integrated into company processes for longer periods via digital networking.

Forms of pseudo-freelancing in particular (as is the case with very many “free” employment contracts) must be eliminated in order to protect those affected, as well as to provide protection against companies using unfair dumping strategies. The key question here is to **update the definition of the concept of an employee**. This concept must cover all in gainful employment and whose labour relations are based on a contract under private law. However, the point of reference here cannot be simply personal dependence, but in future must also be economic dependence. People who are personally independent but economically dependent according to their employment contract must enjoy the protection accorded to employees.

Vision 9:

Rights of co-determination and workers' representation in new forms of work

Vision:

Rights of co-determination apply to employees in new forms of work. They can articulate and enforce the collective interests of workers.

With the increasing decoupling of work in terms of time and place and the emergence of new forms of work, e.g. through **mobile work** or teleworking, active co-determination is becoming more difficult for those affected. This makes it more difficult to experience or recognise shared problems as such and to articulate and, where necessary, enforce the collective interests of workers.

However, questions regarding competence and responsibility also arise for in-house employee representation. Access of works council members to employees is limited since they are not present at a specific

workplace. Creating solidarity between employees is becoming more difficult. Creating a works council can be massively hindered, insofar as it is legally possible.

Co-determination at work must be placed on a new, stable, legal foundation, for example through a modern definition of the term business operation.

Accessibility of workers must be rethought and new approaches developed. For example, the works council can reach and advise workers via social networks/chats/etc. Access to and use of company data needed to enforce workers' interests in accordance with their rights must be guaranteed. **Solidarity** among crowdworkers, for example, can be strengthened if they come together on platforms to exchange their experiences about work/employers.

Further questions:

- To what extent do the basic concepts of labour law (employee or business operation) also apply to the digital world of work? How can labour law and employee protection laws be implemented effectively?
- How can the standards of labour law be safeguarded in a globally networked labour market? What possibilities for networking “digital” employees currently exist and how can they be supported?
- Fundamental empirical research on the living conditions, working conditions and remuneration of crowdworkers and other service workers
- What are the challenges faced by co-determination at work and balancing interests in a changed working world?
- How should the provisions of the Arbeitsverfassungsgesetz (Labour Relations Act) and of data protection be modified to protect or enforce the interests of workers as well as creating transparency for those affected (employees, works council, sectoral representation of interests)?

Vision 10:

A balance of power between consumers and companies

Vision:

There is a balance of power between consumers and companies; both parties benefit from what is offered and the opportunities of the digital transformation. Representation of interests can be managed and influenced actively.

The digital transformation creates some new – very positive – **options for consumers**: Offerors are under pressure from greater competition; prices are not merely lower for consumers, but can also be compared (e.g. geizhals.at); product quality increases; information can be obtained from various sources (offerors, other consumers, test organisations, NGOs, etc.), enabling people to make optimised (purchase) decisions.

However, companies also know how to utilise developments to their own advantage. Using the digital imprint of big data⁴ companies are fully aware of the profiles of individual customers and also know exactly where consumers are at the moment (e.g. through use of beacon technology⁵).

This can be exploited very effectively in terms of marketing – prices are individualised further and updated more frequently (key word: electronic price tags), making it more difficult for consumers to compare prices. Consumers are not safe from deception, whether being influenced by information or even being manipulated.

The power (of information) clearly lies with companies; however, equality between consumers and offerors is suggested and even consumer power is proclaimed – consumers influence what is offered by their purchase decisions. This means that individual consumers can be made responsible for far-reaching consequences (key word: sustainability); however, politics and business must bear responsibility here. **Consumer protection must act against this**; however, due to the numerous and fast-paced developments legal provisions often lag behind; players are often difficult to seize hold of and therefore it is difficult to call them to account.

Further questions:

- What effect is the digital transformation having on the balance of power between consumers and business?
- How can consumers utilise the digital transformation to their benefit? How can representatives of interest groups take action?

Vision 11: Special interest policies for consumers and workers

Vision:

Consumers benefit from the digital transformation in the form of simplification, co-determination and participation that is not at the expense of workers/employees. Comprehensive special interest policies respect the interests of consumers as well as those of workers/employees.

The concept “consumer” is subject to change. **Today consumers carry out numerous tasks that were previously carried out by others – namely paid employees – as a matter of course.** More and more is being outsourced; in the meantime we now have self-service cash desks where consumers scan in the prices of products themselves. A further example is bank transactions: previously paying in money at the counter using a payment form was free, but banks are increasingly levying a fee for this in order to shift consumers to use online banking completely. The digital transformation is providing ever more impetus to such changes. In Web 2.0 co-determination is based on evaluations, blogging, likes,

⁴ Cf. AG Datenschutz/Datenmacht (Study Group Data Protection/Data Power)

⁵ With the aid of mini-transmitters, smartphones and other devices can also be used in closed rooms. Using the corresponding apps, offerors can track the exact movement profile of consumers and can pinpoint details on individual buying behaviour and consumption patterns.

etc. – consumers enjoy participating because they can benefit from the experience of others. This type of cheap marketing is all too often exploited by companies; this results in non-transparency of information, while consumers can also suffer from the consequences.

These developments also offer benefits for consumers, above all saving time and offering flexibility; however, we should not forget that this means consumers taking on more work (but often not enjoying more advantageous pricing), acting as cheap labour for companies and thus gradually creating more job losses. Hence consumers are increasingly becoming **prosumers** in the conflict zone between active participation and exploitation. Special interest policies are needed here which address the needs of consumers as well as those of workers. The interests of both target groups can overlap in part as well as being diametrically opposed. Therefore an approach is needed away from role and target group formulas, concentrating instead on holistic social policy.

Further questions:

- What effect is the development of prosumers having on the labour market?
- How can prosumers be protected by special interest group policies? Is legal change needed?

4.4. Digital transformation, politics and democracy

The new technical opportunities are changing political communication and the quality of democratic processes. The democratic decision-making process, the creation of public opinion and political participation are faced with a series of contradictions.

New possibilities for participating in the political discussion are being created; boundaries between new producers and consumers are disappearing. At the same time specific skills and information are needed in order to identify (political) sources. **Trust** is a major factor in these conditions; this leads to the question of what builds trust. The roles of the large media companies and state institutions are becoming increasingly blurred. The sheer size and plurality of the information on offer results in a certain superficiality. We are talking of “**lightweight political participation**” – where a “like” has no real consequences. There is a contradiction between virtual debates and the actual consequences on state/social institutions or organised political practice. A growing variety of individual positions and the possibility of advancing these on individual channels constitutes new challenges to the collective decision-making process. These conflicts have to be addressed.

Vision 12:

New forms of online participation

Vision:

New forms of online participation mean that the socially selective mechanisms of a representative democracy are counterbalanced and the self-exclusion of certain social groups is diminished.

The **capacity for mobilising protests** appears to rise with the degree of digital development. The recent “Occupy” protests or the “Refugees welcome” movement can be cited as prominent examples of successful political mobilisation via social media. Political mobilisation is also possible technically with the minimum of funding. Regarding new forms of co-determination, the key question should be whether tools such as e-voting or liquid democracy (which is often mentioned in combination with direct democratic elements) **can actually increase participation or whether it does not lead to greater self-exclusion of social groups with lower internet skills.**

The **inclusive capacity** of comparatively low (economic) barriers to entry are confronted with exclusive (economic, social technical) mechanisms. The possibility of disseminating information oneself results in a new digital divide in political terms – between those who disseminate information and those who consume it.

However, decentralisation, individualisation and a wide-reaching rejection of social objectives also results in male dominance in online discussions and in the dissemination of information. The problem becomes evident with the glaring **gender bias** in Wikipedia. It is an explosive matter in terms of the whole of society because the online encyclopaedia has effectively replaced traditional encyclopaedias. Empirical investigations in this direction are already pointing to a backlash in terms of women’s politics – for example in historical articles – since standards fought for by feminist academics are being ignored in this new form of knowledge creation.

Further questions:

- Do “likes” really replace political activity or do they happen in addition – Is “online activism” substitutional? Can this introduce people to political issues?
- Who participates (structurally) in online participative processes in the political system in Austria (e.g. declarations of agreement for petitions to the National Council)?
- Which examples of functioning online participation can be identified? Which forms of online participation actually result in the participation of people from educationally and socially disadvantaged groups?
- Which problems and democratic opportunities are inherent in the various process instruments?

Vision 13: Online transparency over economic interests

Vision:

Concepts of online transparency increase the pressure on private institutions to reveal their economic interests and networking. Individual users can recognise power structures of the private sector more easily behind political activism or proprietary interests of institutional disseminators of information.

The question of transparency is fraught with a series of contradictions. The possibility of communicating large amounts of information and data rapidly and cheaply calls for institutions to share such information with the general public in the public interest. However, this entails the risk that a comprehensive **call for**

transparency is directed at public institutions or those financed with public funds only, while the **private sector, private lobbying processes and private power structures remain non-transparent**. This applies in particular to disseminators of information (institutional or individual).

Ironically, in addition to the chance for democratisation, there is also the danger of a **massive monopolistic tendency**. The US market for internet search questions is dominated to more than 98 % by three companies: (Google, Yahoo, Bing) – 75% by Google alone. Investigations of various random samples show a highly unequal distribution for the communications platform Twitter: while some Twitter accounts have a large number of followers (and hence an enormous reach), there are a large number of Twitter accounts with only a very small number of followers. In other words: despite access being formally on an equal footing and far-reaching capacity for democratisation, the media today comprise very few transmitters and many receivers - and vice versa. Non-profit projects such as Wikipedia also leave little room for competition. All these information channels are known as superstar markets.

Possible questions for research:

- How can individual information users identify cash-rich players more easily or what aids and tools do individuals need in order to detect such structures?

Vision 14: Regulation of platforms

Vision:

A discursive approach clearly differentiates between resource-friendly non-profit sharing platforms and the profit-oriented mediation of vulnerable employment. People who work in these new structures are included in state security systems and institutional organisations representing their interests. Companies pay a fair contribution to financing public expenses.

The contradiction between democratisation and centralisation is close to the **contradiction between sharing and monopolising**. The concept of the **sharing economy** is understood today as a series of mediation platforms, ostensibly committed to sharing goods and work;⁶ however, they often reveal a clear for-profit character of their proprietors. In this area sharing, resource-efficiency and joint action could be promoted by new sources of information. At the same time this activity creates added value which has to be distributed fairly. While employees lose secure jobs that cover their living costs, companies such as Uber or AirBnB benefit from low capital lockup, low marginal costs and low personnel costs.

The trend for **work to become more informal** (called “helping out” or “neighbourly help” in this context) also poses a problem in this area. This development is frequently accompanied by greater vulnerability and tax evasion, but occurs in an overall situation which promises profits to companies offering these platforms. From the point of view of special interest groups, ways must be found to make for-profit

⁶ Cf. Working Group Zukunft der Arbeit, Arbeit der Zukunft (The future of work, work of the future)

companies that take over platforms and sharing economy concepts make their ownership and income structures transparent so that they can be clearly distinguished from exchange platforms oriented towards the community.

Possible questions for research and challenges:

- How can the sharing economy be defined or delimited? What concepts can be created to describe for-profit models which claim this category for their own (e.g. “pseudo-sharing”)?
- What specific models are there which can incorporate people performing informalised work in these areas into solidarity systems? (Client contribution, tax on value creation, client liability, modification of the ANI concept)
- Companies that locate themselves in the sharing economy display marked tendencies to create monopolies because of networking effects. What options are there for breaking up these monopolies/oligopolies? Are there already examples of this that we can observe?
- Which taxes and contributions are evaded through models of the sharing economy? What options are there to tax platforms or offerors on platforms (e.g. AirBnB, Uber)? Which local authorities and countries have already found solutions?

5. DATA PROTECTION, DATA POWER AND DATA DISTRIBUTION

Mathias Grandosek (paper coordinator), Martina Chlestil, Frank Ey, Nina Matousek, Daniela Zimmer

Questions on data protection and data power play a key role in the digital transformation. Data become increasingly important in a digital environment and the debate about handling data, the protection of such information, privacy and the effects on competition through access to data play an important role at varying levels. This chapter takes a closer look at the questions which arise in relation to data, dividing them into four different aspects:

- Citizens and consumers
- Workers
- The economy and companies
- Law and institutions

5.1. Employee data protection

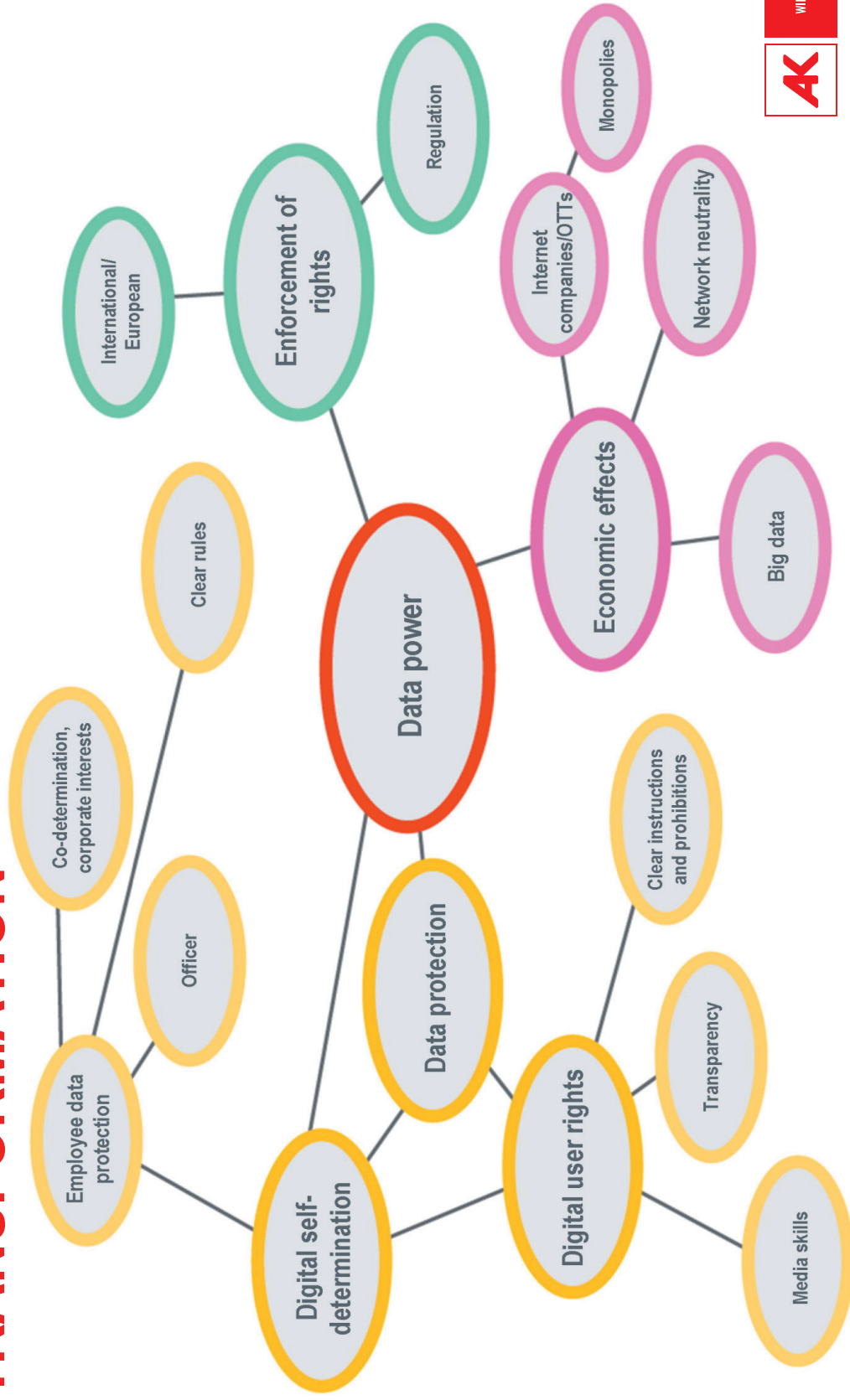
Work using digital tools and media has largely become a predominant characteristic of jobs today. Digital work is characterised by the extensive use of modern information and communication technologies (e.g. laptops, smartphones) and application software, underlying support for work processes through computerised, networked machines (e.g. production robots), design of digital products by programming and offering services via online platforms (e.g. crowdworking), through global networking and the transmission of employees' data to countries outside the EU with often a very low level of data protection.

We are endeavouring to benefit from the economic opportunities of this digitisation. However, employees' rights may not be ignored; these rights must be protected. **Therefore digitisation must be designed with the employee in mind: this includes extensive employee data protection** that is worthy of the name! Furthermore, **co-determination rights of employees** and works councils' right of consultation must be adapted to digital work: they are more important than ever in a digitised working environment. The planned EU Data Protection Directive must provide the necessary support.

In a negative view, "deterising" all aspects of life, including the working activities of employees, leads to an absolutely inhuman view of man. The performance of workers is expressed, measured, compared, analysed in figures. Workers then become merely their data; the immaterial value of work, the dignity of workers fall by the wayside.

DIGITAL TRANSFORMATION

How can we make the digital transformation fair?



Vision 1: Strengthening co- and self-determination rights of employees

Vision:

Employees must have the right to self-determination regarding information. The use of all personal data that are not absolutely necessary must be linked to the free consent of the employees concerned to be given in advance. Minimum requirements for consent must be established. Revocation of consent must be free of discrimination and must be ensured both technically and administratively.

The special requirements of employee data protection must be included in the development of technical systems implemented in businesses ("privacy by design" and "privacy by default").

Vision 2: Data protection officers for businesses

Vision:

The mandatory appointment of an in-company data protection officer for the smallest possible number of employees upwards is indispensable. Small and medium sized companies should be able to use external institutions because the protection of employees' personal data must also be ensured in small companies without compromise. The appointment of a data protection officer is especially important for businesses without works councils.

The requirements for data protection officers must include: a fixed job profile, competence regarding the transfer of personal data to countries outside the EU, a fixed qualifications profile, working hours appropriate to the size of the business/volume of data used, not subject to instructions, as well as complainant protection and discrimination prohibition. Data protection officers would also assume an important function in raising awareness and shaping public opinion in society!

Labour contracts give rise to a spate of employee data which have to be processed. Current regulations according to DSG 2000 and ArbZG (Labour Relations Act Art. 96a, 96) and ArbZG (Labour Contract Law – Amendment Act Art. 10) are not sufficient to protect the personality rights of employees effectively.

Vision 3:

Clear instructions and prohibitions in a separate employee data protection law

Vision:

Employees must be protected against wrongful acquisition and utilisation of their data. Therefore appropriate data protection regulations for employees and efficient enforcement of the law to protect employee data in a business context must be addressed and laid down in a **separate law on employee data protection**. The planned EU directive on data protection must support this.

The following must be regulated expressly: Transparency requirement, data economy, significantly heavier penalties for infringements, prohibition of evaluation of evidence, conditions for the necessity of data utilisation must be specified and tightened, strict limitation of purpose, required consent for all personal data that are not absolutely necessary (strict requirements for voluntary consent), approval required for sensitive data applications according to data protection (e.g. for software that records and documents the behaviour of users in a differentiated manner). If employee data are recorded in a system and used in various other systems – possibly also external – then data protection must be guaranteed throughout the whole chain.

Employees who themselves work with personal data must be given special support and training; working conditions in accordance with data protection regulations must be created within the company.

“Supervision, data protection and control” are growing in importance for **employee representation organisations** and open up completely new courses for action, brought about by the constant advance in technology, dismantling of company structures, the removal of barriers to work and blurring of the division between the public and private spheres.

Vision 4:

Sufficient resources for employee representation

Vision:

In order to remain on top of developments, consistent training and further training and constant watchfulness is required. All too often members of works councils reach the limits of their resources regarding time and money. They need an urgent increase in their time budget and the option to acquire their own expertise and support when analysing technical systems.

Vision 5: Incentive systems

Vision:

Incentive systems are created for employees who take in-house employee data protection seriously, e.g. data protection quality label or tax relief when using data protection-friendly methods.

There should be incentive systems for employees and companies to comply with data protection regulations. These could be: Tax relief for the creation and/or utilisation of data protection-friendly tools, methods, programs, etc.; awarding data protection quality labels; special recognition when awarding public procurement contracts; recognition/reward for regularly checking data protection standards in-house/for holding data protection audits or similar.

Possible questions for research:

- Fundamental empirical research on “working conditions in the light of employee data protection regulations” and on changing “working conditions in the light of employee data protection regulations” due to the constantly expanding use of new technologies in the workplace.
- Are the current provisions of DSG (Data Protection Act) 2000, co-determination rights of works’ council according to Art. 96, 96a ArbVG (Labour Relations Act) or the right of consent of employees according to Art. 10 AVRAG (Labour Contract Law – Amendment Act)) still appropriate for the requirements for updated, robust protection of employees’ data in today’s digital working environment?
- What provisions must data protection regulations contain in order to ensure up to date protection of employees’ data?
- How must the right to participate of employees’ representatives (works council, group works council, etc.) and the right of consent of employees be formulated in order to ensure up to date protection of employees’ data?

5.2. Digital user rights

Both in the private and in the public sphere we are confronted with the **pleasant and the unwanted side-effects of digital progress and of life in the information society**. To a certain extent we have accepted the grey areas and violations of rules in the Internet.

However, this may not put a brake on our commitment to search for effective concepts for legislation and enforcement of rights in the digital world. The “always-on” Internet in the form of smartphones or cars upgraded to become networked computers means that data are always being created. This increases the incentive to use data for other uses - for commercial business ideas, to optimise administration, for risk prevention, for science, law enforcement, etc. The right laid down in the EU Charter of Fundamental Rights to the protection of personal data and privacy is not (always) given the significance it is due in a society built on liberties. It includes above all the right to self-determination of every individual over the use of his/her personal data. So that we can answer the question of who benefits from the digital revolution with “all of us”, digital users and data protection must be given a high priority in Austrian and

European politics. For **“Der Verbraucher im digitalen Zeitalter kauft nicht nur ein Produkt, er wird selbst zum Produkt.”** (In the digital age the consumer does not only buy a product, he becomes a product himself”. (Frank Schirrmacher, former co-publisher of FAZ).

Vision 6:

Priority for data protection concerns

Vision:

The field of action for designing technology that respects privacy is not left to companies alone. The legislator, regulatory and enforcement authorities take corrective action if an imbalance of power occurs and risks emerge that undermine the rights of digital users.

- The equipment and technical expertise of data protection agencies must keep pace with the stringent requirements for such a controlling body. In view of the millions of data processing actions, this agency needs appropriate resources.
- The government identifies new scenarios that pose a risk to privacy (such as connected cars, scoring, the Internet of Things, etc.) and develops action plans at an early stage which protect the weaker position of consumers.

Vision 7:

Transparency and the right to self-determination

Vision:

What we do not want is data protection for a minority that keeps its distance from technical developments, that can afford to enforce its rights or knows how to protect itself thanks to its specialist technical knowledge. Data utilisation processes must therefore be transparent for all those affected. Consumers must be able to decide for themselves on the (non) utilisation of data that are not necessary for performance of a contract.

- Data processing actions carried out without the people concerned noticing must be made more transparent. The people concerned do not currently comprehend the consequences of their decisions. Regarding products also based on consumer profiles and algorithms (e.g. search machine results, evaluations of behaviour and creditworthiness, dynamic pricing in online shopping), consumers have a claim to readily understandable explanations of the parameters and data-based logic.
- The right of self-determination and utilisation of people's own personal data must be defended, updated and extended. Obtaining consent to data utilisation is often a skimpy cover-up. Instead of consent through implicit acceptance of GT&Cs, data users must always make the effort to receive an active, express indication by those concerned. Privileging direct marketing, for example, with the

mere right of withdrawal should not be allowed: consumers expect that they are asked for their explicit consent for their data to be used for marketing purposes. Consumers have no alternative because without their consent they are not given access to the service. Therefore we need alternatives to “free” internet offers financed through data.

Vision 8: Clear instructions and prohibitions

Vision:

The digital trade with data is characterised by a major imbalance of forces. The sovereignty of interpretation as to when data utilisation, for example, is “in the predominantly justified interest” of data users or is “proportionate” lies with the structurally stronger data users. Therefore consumer protection is intensified in the form of legal instructions and prohibitions for data usage. The aim is to set specific permitted limits to data-sensitive tasks such as online marketing, profile creation or credit scorings.

- Clearly defined limits for permitted data processing and prohibition of data processing will improve legal certainty. Considerations of individual cases regarding predominantly confidentiality vs. utilisation interests in the pertinent data, which are not addressed by courts and data protection agencies except in case of dispute, should be the exception.
- Anonymisation as the expression of data economy is only encouraged when data protection legislation is enforced. If the necessity of user profiles is not proved unambiguously, then data have to be made anonymous before they can be used. Pseudo-anonymisation should be the exception since data users can recreate user profiles in such cases.
- Data may not be used for purposes that are not consistent with the original reason for storing them. Exceptions to this prohibition (such as processing for statistical or historical reasons) must be handled restrictively. Data economy must be a benchmark that is applied more seriously by administration and in business.
- Regulation of the use of technical tools that can be used to track user behaviour on the Internet must be made more effective and practical.
- Limits to the utilisation of big data analyses and forecasts: these use classifications and forecasts, for example in order to eliminate unwanted customer relations. Current data protection regulations must also be enforced effectively in the field of data-based forecasts. Traditional data protection must be supplemented with a prohibition on discrimination through evaluation processes. Gaps in legislation must be closed in relation to the use of data processing for specific purposes. In order to protect consumers, the following question must be clarified: under what conditions may personal profiles be created at all and the maximum types of data that can be processed.
- More protection vis-à-vis dominant internet groups domiciled in third countries, above all in the USA. Quasi-monopolies such as Google, Apple, Facebook, etc. have almost unlimited market power, a global presence and gigantic volumes of customer data. Therefore the EU must ensure that these over-the-top players accept more responsibility under data protection laws.

5.3. Enforcement of rights

Vision 9: Improved legal protection

Vision:

A permanent infringement of the principle of data protection in Europe also undermines the effectiveness and social acceptance of these disregarded rules. The enormous deficits in law enforcement must be addressed systematically and eliminated in the long term.

The cross-border character of the Internet, the power of individual internet groups, the possibilities of anonymisation and non-transparent technical processes restrict the possibilities of users to protect themselves and hence also their personal responsibility. **The state must also provide sufficient protection of its citizens on the Internet.**

- Greater value is placed on preventive data protection instead of subsequent damages (e.g. by official checks in advance, data protection quality labels, privacy by design/by default). We should not skimp on data security either, even if it causes significant costs in individual cases.
- If an infringement is suspected everyone must be able to turn to a data protection agency which gives low-threshold advice and legal protection. The current fragmentation of competence between the data protection agency and civil courts is obsolete. A modern data protection agency must be a one-stop shop for complaints about data processing both in the public and in the private sphere. Moreover, the data protection agency should also promote awareness of data protection, uncover deficiencies and act as a competence centre to further develop data protection. Until 2014 supervisory functions and part of legal protection were carried out by a collegiate body (with a judge as chairperson and including social partners). The authority is now monocratic. By no longer including stakeholders with different backgrounds regarding knowledge and experience, an important element of deliberative decision-making has been lost. Their participation in an appropriate manner in the many decisions and evaluations made by the authority must be ensured.
- At present data users do not need to fear either (rapid) uncovering of illegal data usage or punishments that act as deterrents. Generally an investigation only takes place after massive complaints or reports in the media. The effectiveness of surveillance and penalties must increase dramatically.

Possible questions for research:

- Scoring regulation (draft proposal for the government) - how could draft legislation be formulated?
- Implications of Industry 4.0 for consumers
- Improvements in legal protection – Reform of the fragmented system (agency, civil courts) and inclusion of stakeholders
- Updated rules for online marketing and profile creation - specific measures against tracking
- Big data and the principle of data protection of collecting data only for the original specific purpose and data economy - an inextricable opposition of interests?
- The Internet of Things using the example of “connected cars”. Recommendations for action to implement the demand that consumers can dispose freely in every regard over a purchased product and over the data generated by the integrated software or sensors.

5.4. The economic effects of the digital transformation

The creation of natural digital monopolies

Services such as Facebook or eBay are characterised by so-called **networking effects**, i.e. the benefit or attractiveness for users increases with the number of people using this service. Once a certain size is reached, the group of users grows almost automatically; costs are marginal while the value increases with each new member. A natural monopoly emerges, often with a global dimension. In the case of eBay or Facebook, the natural digital monopolies can be traced back to the large number of users and their data which no other company has access to. New competitors entering the market scarcely stand a chance of becoming successful.

Data power of digital groups

Among social media services Facebook, with around 83.5%, has the largest market share worldwide. Users reveal their information voluntarily because exchanging information is often the reason for using the service. This increases the company's data power: A US study reveals that it is possible to draw conclusions about personal characteristics and preferences of users via "likes".⁷ Google can also draw conclusions about users from search queries. The benefit for users is the rapid result of a search; however, the costs lie in the fact that the data they enter are processed further. Digital groups such as Google can use their **(data) power** to steer the results of a search in a certain direction. The greatest benefit that digital groups can draw from their monopoly lies in downstream services, especially in targeted ad placing.

Regulating digital monopolies – but how?

To date there are very few answers to the question of how to break up digital monopolies and create more competition. Some considerations include:

- strict regulation of handling available data, ensuring offerors assume responsibility in accordance with data protection legislation.
- Forcing digital groups that dominate the market to reveal their data to competitors; however, this appears questionable with regard to data protection⁸.
- A regulation stipulating that users can take their data with them when they change providers.
- The appointment of a data regulator who has access to all data of digital groups in order to prevent misuse of these data.
- The provisions of digital monopoly services by public authorities to ensure optimum allocation and prevent a scarcity of supply.
- Raising awareness of users of their data being released.

How great the power of digital monopolies is can be seen in the example of Microsoft, which was sentenced to a fine because it disadvantaged competitors in browser services. The EU Commission is also currently investigating Google for abuse of its monopoly.

⁷ Cf. Kommerzielle digitale Überwachung im Alltag (Commercial digital surveillance in your daily life) by Wolfie Christl (Cracked Labs), commissioned by the Chamber of Labour Vienna, November 2014

⁸ Cf. Was tun mit Google? (What to do with Google?), Commentary by Patrick Bernau, Frankfurter Allgemeine Zeitung dated 20 April 2015, <http://www.faz.net/aktuell/wirtschaft/maechtige-internetriesen/das-google-verfahren-und-das-natuerliche-monopol-was-tun-13547280.html>

Vision 10: Measures against monopolisation

Vision:

Legal measures are required in order to prevent abuse by digital groups of their monopoly position. It must be possible for users to take their data with them when they change providers. The creation of a data regulator should be considered. Users should be made aware through training courses that their personal data are being released.

Vision 11: Legal rules for OTT players

Vision:

OTT services must be subject to the same legal rules as telecommunications companies; for example, it must be ensured that OTT players assume their responsibilities under data protection legislation. This is the only way to prevent unfair competition or a distortion of competition.

OTT content is audiovisual content and text-based news services transmitted via internet cables without internet service providers being directly involved. This is problematic because the providers do not know what content is being transmitted via their cables and therefore are not responsible for it. Many companies are already using OTT, e.g. Netflix, WhatsApp or Skype. A broad bandwidth is often required to be able to use this content.

It is this fact that is criticised by the companies that provide broadband cables: network operators have to bear the investment costs, while OTT players scoop the profits. **Services are offered around the globe; national regulations such as data protection scarcely play any role for these offerors.** Furthermore, OTT players do not offer any services in the general public interest – such as the possibility of making an emergency call. Network operators want OTT offerors to pay to use their networks. For users these new services are of use to the extent that they have access to an enormous amount of videos and audios, as well as text-based news services.

Possible questions for research:

- What options are there for breaking up the monopoly of digital services?
- Is competition in digital services characterised by networking effects at all possible?
- How can the data power of digital groups be better regulated?

5.5. Big data

Advancing digitisation produces, stores, analyses, processes, combines and provides access to ever more data. These data are partly generated from technical processes (communication procedures, sensors, smartphones, the Internet of Things), and partly acquired and stored on purpose (user data, tracking, recording behaviour).

If the problem not so very long ago was to actually obtain data in order to answer (research) questions, the problem now is the reverse: what are the questions that you can answer with such enormous amounts of data and how can these volumes be processed?

“The concept of big data generally means the extraction of new knowledge to support decisions for a wide variety of questions based on increasing heterogeneous data volume. This new knowledge comprises the added value for organisations on the basis of the new raw material – data.”⁹

So data have **an enormous meaning for future economic processes, value creation, prosperity and for new scientific insights**. However, certain risks are also involved. While users place great hopes in big data, on the other side the question is posed as to how far the increasing pressure to release data is justified in the case of internet users and which negative effects this might be linked to.

Implications:

According to the Berlin Big Data Center, the growing spate of data, networking and the possibility to analyse these data has five different implications and dimensions¹⁰:

- Economic aspects: How can data be used for new business models? How can I procure a competitive advantage? What is the value of information? What pricing possibilities exist for companies (dynamic pricing)?
- Social aspects: How do new technologies and the possibility of a real-time analysis of data change social interaction, user behaviour and cooperation?
- Legal dimensions: Data protection, security, privacy, copyright, right of ownership, etc.
- Technological aspects: How can this flood of data be stored, handled and processed?
- Application dimension: How can big data contribute to better solutions to problems (traffic, archiving knowledge, Industry 4.0, domotics, environmental protection, energy savings, etc.)?

Ethics and data - should we do everything we are able to?

The volume of data will continue to grow apace. The creativity of data users will also increase to offer ever more sophisticated options for analysis. This poses numerous economic, legal and ethical questions. The Data Protection Act is based on personal data which must be protected. However, boundaries are becoming blurred and big data analyses and applications go far beyond this. Therefore there is a need for a broad discussion in society on data ethics and what society basically agrees could and should be permitted.

⁹ M. Köhler, M Meir-Huber, #BigData in# Austria – Endbericht – österreichische Potenziale und Best Practice für Big Data (Final Report – Potential and Best Practice for Big Data) April 2014, BMVIT study

¹⁰ Cf. Volker Markl, Berlin Big Data Center: <http://www.bbdc.berlin/1/medien-presse/blog-artikel/#c1905>

Vision 12: Transparency and traceability

Vision:

The generation, utilisation, transmission, analysis and combination of data (both personal and data where the use has consequences for users) is subject to certain principles and is above all transparent and traceable. If people are the sources of data or if they are confronted with the results of big data analyses, for example by receiving targeted offers, this process is revealed.

Vision 13: Possibility of differentiated use

Vision:

People who use certain apps, websites or devices can themselves decide in a differentiated manner which data they want to provide when and to whom. They are no longer forced to either use services in an all-or-nothing scenario by revealing all or to dispense with the use of the service completely.

Vision 14: Consent to and visibility of further collection and exploitation

Vision:

Companies only collect and make use of data that are absolutely necessary to provide their services. Any other form of collecting data or exploitation beyond this purpose requires the consent of users and to reveal what is to happen with those data.

5.6. Data and competition

Almost all devices nowadays contain integrated software-driven electronics which, in combination with numerous sensors, collect, analyse and store data and often make it available to manufacturers via networks. It is certain that this is useful not least to improve products or to lower (operating) costs (e.g. optimisation of service intervals).

However, it becomes problematical when **manufacturers gain control over additional value added chains and monopolise them** (e.g. if a service can only be performed by the manufacturer himself because other repair shops do not have access to the required data).

It has been the object of some legal disputes to what extent software built into objects is also transferred to the **power of disposal of the purchaser**, or is completely disassociated from the purchaser. Nor is it easy to say who the data recorded by the various sensors belong to.

Conversely, revealing data also poses a certain security risk. It will also be necessary here to find a balance between purchasers of a product who are interested in obtaining a wide-ranging right of disposal (and ownership) over the purchased object, and manufacturers who want to take control of value added chains via software and otherwise inaccessible data.

Vision 15:

Acquiring immaterial parts when purchasing products

Vision:

When purchasing products you always acquire ownership over immaterial parts and the data generated. Manufacturers ensure that these data are made available to others according to certain criteria. Permeability is necessary, especially along additional value added chains. Purchasers of products must be able to decide themselves who to entrust with the maintenance of their property.

5.7. Open data

Making open data available **can stimulate additional growth and help to make knowledge accessible, utilise capacity for innovation** and encourage creativity. Public services are increasingly required to make data available to others (e.g. real-time data of public transport). In order to make even more use of such capacities, the trend to open data should be given wide scope in future wherever possible.

Vision 16:

Utilisation of open data

Vision:

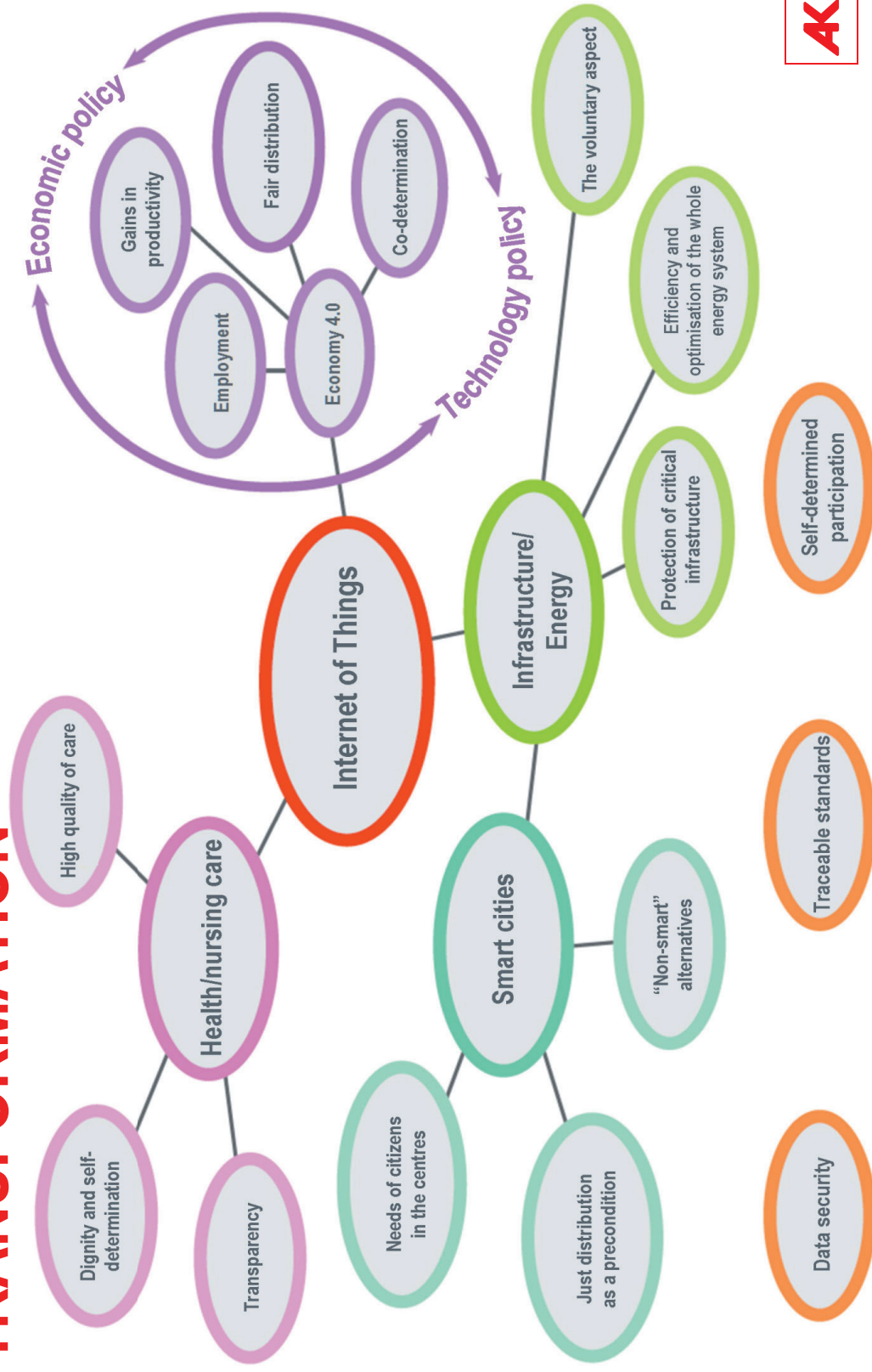
Data are being made accessible publicly to an increasing extent and hence further utilisation is made possible, as long as the data do not have a reference to people or other reasons argue against it. This should not be limited to the public sphere only.

Possible questions for research:

- Where are downstream value added chains being integrated increasingly and monopolised to a greater extent through access to data (e.g. servicing products) and what trends can we observe?
- How high is the awareness of users of which data they are revealing, how the data are being utilised and what options they have to intervene in the transmission of their data?
- Which business models are based on big data? Which data are worth how much? How are data from different platforms linked?

DIGITAL TRANSFORMATION

How can we make the digital transformation fair?



6. THE INTERNET OF THINGS IN PRODUCTION, SERVICES AND THE PUBLIC SECTOR

Lang Roland (paper coordinator), Heiling Michael, Pezenka Dominik, Prenner Peter, Prinzing Stephanie

6.1. Description of the phenomenon “The Internet of Things”, assessment of its significance

The term “The Internet of Things” (and by extension: “and Services”) designates a multi-layer basic technological phenomenon. **Hitherto “passive” physical objects** (devices, machines, products, etc.) **are connected via the Internet** and become capable of recording **data and instructions, processing and transmitting them** (cyber physical system). All this without human action and not only in the immediate vicinity but in real time – across continents as well. The Internet of Things (IoT) is not a single technology, but a term that comprises numerous individual technical building blocks or software solutions¹¹.

Many of these and other building blocks have been around for some time, but recent years have seen developments occurring at an explosive rate¹² – mostly combined with large reductions in costs. The interaction of these developments appears to be leading to new dimensions and is bringing applications near to the (technically) possible and also sensible (at least in business terms), **which were inconceivable only 10 years ago**.

With the implementation of Web 2.0 and as a result of the widespread diffusion of the Internet since the turn of the century we have seen significant effects on consumer behaviour, jobs, production processes, business models and whole sectors. We only need to think of books and publishing, the music industry, the retail trade, tourism, etc.

Overall **broad and significant social changes** have occurred - a sign of basic technologies. The same can also be expected of a broad diffusion of the use of the Internet of Things.

Currently a wide variety of possible applications are being designed for numerous areas of the economy and society - by companies, academics, public and private institutions. They are already being implemented in stages or as single modules. For example, in various production areas (Industry 4.0), in logistics, the transport sector/mobility, health and healthcare, the retail trade, the energy sector, mining, agriculture, public services, etc.

Nevertheless: the fast pace of technical developments should not blind us to the highly visible number of questions that are as yet without a technical solution. The saturation of our world with the IoT will for a long time resemble a patchwork of large and small, global and locally created solutions, drafts and

¹¹ Sensors play an important role (measuring/recording/transmitting information), also players (receiving/processing information and turning it into instructions), broadband internet connections for large volumes of data (in combination with smartphones, tablets, cloud computing, community platforms), 3D printing, machine-to-machine communication.

¹² For example towards: miniaturisation, unique identification possibilities, practically zero energy consumption, artificial intelligence, standardisation, possibilities for analysing large data volumes, etc.

workarounds. In many sensitive areas (health, production, etc.) penetration on a broad basis will certainly also depend on the **guarantee of secure data transmission and the clarification of data protection issues**¹³.

And above all it is time to make people all the more aware that it is a misconception to assume that technical solutions are adopted by society on a one-to-one basis. Social contexts change in a dynamic interaction of technology and society. Solutions that are technically possible do not inevitably determine how we work, what we consume and what our society looks like. People do not have to adapt to the requirements of a technical solution. On the contrary: **the actual implementation of technology can be influenced.**

Logically this means for us the task is to dare to take a step **beyond** the current **discussion centred on technology**. It is a question of formulating visions oriented to the needs of workers and consumers which emphasise a fair distribution of “digital dividends”. These are visions of what optimum implementation and penetration of society by the IoT should look like.

6.2. The smart city

The term smart city is normally used in conjunction with growing cities and their ability to adapt to the future. However, it is not sufficiently clear what a city needs in order to become a smart city. There is as yet no standard definition for a smart city. However, the general idea is: in order to adapt to future needs, cities have to develop smart concepts. The cornerstones mostly include energy and resource efficiency, modern information and communication technologies, intelligent networking, mobility and governance.

A smart city must always provide intelligent and innovative solutions for the **responsible and sustainable use of resources**. This is to ensure **ecological, economic and social efficiency** for all citizens. In Vienna people intend to face the challenges of the 21st century with a cross-disciplinary strategy using intelligent technologies. The city is to be modernised continuously; energy consumption and emissions are to be reduced without people having to do without quality of life, comfort or mobility. (<https://smartcity.wien.gv.at/>).

The fact cannot be ignored that sensible sustainability strives for a long-term balance of ecological, economic and social needs and demands good governance. **Attempts to ensure sustainability** – such as the current Smart City concepts (**without major intervention by systems** using intelligent controls, appropriate networking and a couple of technical innovations) – **which are based on purely efficiency endeavours and technical solutions, are generally less likely to attain the objective** but are extremely attractive to individual companies offering the required innovative products and services because they are highly profitable. In short: the term smart city hides markets worth billions.

¹³ Regarding questions of data protection, see the comments of the specific working group

Vision 1:

Smart cities in the interest of people

Vision:

Motivation and initiatives for smart cities are based on the interests of the people living in cities and not on the interests of companies and opportunities for private profit making.

Companies in the technology sector have a profit-oriented interest in helping to shape smart cities. In this connection urban administrative and political bodies are working closely with large companies. Several **critical developments** could arise. Firstly, **urban infrastructure can increasingly fall into the hands of private companies** who can act against the interests of the population. Secondly the question must be asked which technical innovations should be given priority.

A smart city should be oriented to the criteria of sustainability and quality of life for all inhabitants of the city and not to the exploitation interests of large companies. In order to ensure this, **financing** must be provided from public funds. If that is not possible – e.g. because of budgetary constraints – only technical innovations that can be controlled publicly/democratically should be implemented. The experience gained from privatisation of public services (e.g. water and energy supply or various transport services) can serve here as a warning.

Questions for research:

- How can the cost-intensive implementation of technical innovations be financed without passing on costs to end consumers?
- How can democratic control over PPP be organised?
- Where will data be physically located when using the Internet of Things in the public sphere / services of general interest / in the field of PPPs? Should the regulatory authorities be required to receive/ provide information? How can data protection be ensured?
- In specific cases when using smart devices in the public sphere, who has contact with data as a result of their job (programmers, hardware designers, public offices, outsourced or privatised companies?) Are models with decentralised storage or data sharing worthwhile?
- In how far can smart concepts in the public sphere be traced back to the concept of privatising tasks or functional privatisation?
- If smart city concepts claim to be long-term urban development strategies, they must also include a social and cultural dimension in addition to technology. What are the key measures needed here? How can they be financed?

Vision 2:

Alternatives to smart concepts

Vision:

Smart city concepts present alternatives for those who do not want to be “smart” or who cannot (afford it). The digital divide in society is counteracted proactively.

Access to and use of digital information and communication methods are distributed unevenly. The important issue here is that this is often determined by social and geographical factors. The possibility of participating is also dependent on the level of education, income, age and the region where people live.

Everyone who does not want to or cannot participate in the smart city should **not be placed at a disadvantage** (see also visions of fundamentals of society). If participation is desired, but not possible, the corresponding mechanisms (e.g. financial, technical support) must be provided.

Questions for research:

- Which new, innovative mechanisms can be considered here?
- What are socially just technologies? How can a balanced social benefit from technologies be achieved? What concepts are available?

Vision 3: Smart cities with fair distribution and balanced finances

Vision:

Smart city concepts include fair distribution and their financing is socially balanced.

The implementation of smart city concepts will require considerable financial means. Since this cannot be covered from public funds alone, new and **innovative financing concepts** must be developed. Possibilities to involve potential or actual **beneficiaries in the investment costs** should be carefully considered (e.g. “tax increment financing”, “development charges” or “value capture”)¹⁴. The exploitation of European financing and subsidy instruments should also be promoted.

Furthermore, from the perspective of social sustainability it is necessary to **distribute the additional burdens** incurred by the implementation of smart city concepts (for example in the form of increased charges, fees or taxes) equitably or to prevent only one group from benefiting from it, while other groups gain almost nothing from these developments.

Questions for research:

- Has experience already been gathered with these financing instruments?
- Which financing instruments are conceivable, apart from PPPs; does involving citizens make sense or are sensible models conceivable: if so, what do they look like?

¹⁴ See http://media.arbeiterkammer.at/stmk/Smart_Cities_2013.pdf

Tax increment financing: landowners pay a compensation sum and so share in the public funds used up to the amount of the costs incurred relative to the increase in value as a result of rehabilitation.

Development charges: rates to be paid by landowners, especially to develop a building plot.

Value capture: real estate companies are obliged to participate in infrastructure projects which will result in an increase in value of their properties.

6.3. Energy

Since the middle of the 1990s the (European) energy industry has undergone a major transformation process. Liberalisation of electricity and gas markets across the EU resulted in massive structural changes at the enterprise level. Following liberalisation the network side (“natural monopoly”) was separated in terms of company law or property law from electricity generation, trading and distribution. Since then electricity generation, trading and distribution are open to competition, while network companies are subject to state regulation. Driven by the discussion around climate change, numerous EU member states have placed the emphasis on a massive expansion of renewable energies, above all volatile wind and solar energy to generate electricity.

The discussion about the “**megatrend of digitisation in the energy sector**” (de facto only the “electricity sector”) began at EU level with thoughts about a mandatory introduction of digital electricity meters, or **smart meters**. These digital electricity meters have a direct communication connection for the immediate transmission of high-resolution consumption data to the energy company or to consumers. At the same time projects to expand a digital or intelligent electricity network control system were initiated, known as **smart grids**.

Smart meters were primarily intended to increase **consumption and cost transparency** for consumers. This was intended to encourage consumers to save energy. **Smart grids** were intended to harmonise electricity consumption better with decentralised electricity generation. The focus was on better regional harmonisation of generation and consumption so that expensive extensions of the network for the transportation of electricity across regions could be reduced. As a consequence of the digitalisation meters and the network infrastructure energy companies are now able to differentiate their homogeneous product “electricity” or “gas” according to time-dependent or demand-related tariff arrangements.

As part of digitisation of the energy sector and in the light of endeavours to protect the climate, it can be assumed that fossil energy applications (for example the combustion engine, oil/gas heating, etc.) will be replaced by electrical applications (electric public transport, e-cars, heat pumps, etc.) **Energy efficiency efforts** in the building sector and smart home applications will increase the level of penetration of automated or remote controlled room temperature controls.

Vision 4: Optimisation of the whole energy system

Vision:

Digitisation of the electricity sector is being used to optimise the energy system. The key element of these optimisation options is communicative networking and the coordination of energy generation and energy consumption.

The laws of physics dictate that supply (electricity generation) and demand (electricity consumption) must be balanced in the electricity network at any one time. The **network operators** are responsible for this **balance**. In the past it was possible with more or less effort to control electricity generation (large power plants) and harmonise them with the relatively unchanging electricity consumption. However, as a result

of growing electricity generation from wind and photovoltaic power, in the short-term ever greater variations in volume occur in supply which can only be compensated with highly technical, organisational and ultimately financial costs.

The aim should be:

The communicative **networking of energy generation units** with automated energy consumption machines, devices and storage units makes better harmonisation possible in terms of time and place between electricity supply and electricity demand. This reduces electricity transport routes and energy losses. **System costs** should fall because expensive balancing measures for producers can be avoided. The necessary investment costs are distributed fairly among all users. In the field of automated production and added value processes (Economy 4.0) significant consumption control possibilities are feasible.

In the private sphere the corresponding harmonisation processes (load shifting) and possible differentiation of tariffs may not result in intervention in people's private and family life. People's self-determined organisation of leisure time must be maintained. Incentives for load shifting in households should be limited to device controls that do not have any impact on leisure activities in private/family life. This includes, for example, automatic control of refrigerators/freezers, water heating (boilers) or heat pumps or in future charging e-cars and other battery storage devices.

Questions for research:

- Who, in the current electricity/energy system, can act as a coordinating point to control supply and demand? Are pure market mechanisms sufficient or are network operators needed as coordinators or regulatory interventions to coordinate digitisation measures?
- Creating an intelligent network infrastructure requires considerable investment which should lead to lower overall system costs in the long term. What options are there for raising the necessary capital, who will benefit from these planned measures and what will be the effects on distribution?
- Studies/surveys on specific consumption behaviour and the potential for shifting loads of the various energy consumption groups (industry, trade, agriculture, households) based on new digital services
- What are the differences regarding participation options in the (digital) transformation of the energy system between rural and urban regions?
- How can the emergence of a 2-tier energy supply be prevented between those who can use digitised energy services thanks to the equipment in their home (photovoltaic system/own electricity production, smart home, controllable household devices, etc.) and those who do not have such options? What conditions must be created in order to prevent or absorb negative effects on vulnerable groups?

Vision 5:

Protection of critical infrastructure

Vision:

Austria can establish itself as the leading European market for sustainable and efficient network operation and the development of the corresponding system components with the implementation of an active and dynamic electricity network control (smart grid). The highest possible standard for the protection of the critical electricity infrastructure will be created.

Austria is making **great efforts to research** the field of smart grids. The first pilot regions have successfully begun trial operations (e.g. Salzburg). Based on current know-how and with the corresponding commitment it appears to be possible for Austrian companies to lead the field in international technology for network control and system components. The technology road map Smart Grids Austria was the first step towards identifying the necessary implementation and coordination stages and to derive the corresponding recommendations for action.

This objective is threatened firstly by the current **reluctance of energy companies to invest** and secondly because of the **need for action in regulatory matters**. As described above, significant investment is needed here too. It should be noted that the acceptance of payers for the necessary network investments is being raised.

The electricity network is the lifeblood of our society and economy. Hence this **critical infrastructure must be protected as best possible. The need for protection increases with digitisation.**

Questions for research:

- Are analyses available of the cost-benefit effect that new smart grid investments have in comparison with traditional network/line investment?
- What added value effects result in the domestic market from smart grid investments? What economic added value can be generated from smart grid investments? What effect will such investments have on jobs?
- What economic measures could intensify these effects even more?
- How can R&D investments in the field of smart grids be compensated for as part of network regulation? What regulatory adaptations are needed to facilitate smart grid investment?
- What conditions are necessary in order to protect the critical infrastructure of the electricity network as best possible? Do analyses or studies exist on this subject?

Vision 6:

The voluntary aspect as a core concept

Vision:

The use of smart metering (also a key instrument in smart city concepts) will be based on the voluntary aspect; data protection is clearly regulated in favour of consumers and there is a clearly positive cost-benefit ratio for consumers.

While network operators are required by law to fit households with modern smart meters, **it is the voluntary decision of consumers to decide which consumption data are transmitted to which market participants**. At the same time care is taken that households who take a restrictive attitude to passing on their consumption data do not suffer any restrictions on their energy supply. The availability of low-data energy supply contracts must be ensured. On the other hand the express consent to pass on data presupposes an absolute lack of pressure, must be related to a specific case and to a specific purpose and presupposes comprehensive information for consumers.

The use of smart metering and derived services should be oriented to the needs of consumers **and result in a clearly recognisable benefit for households**. An appropriate cost-benefit ratio is ensured for all participating households if possible.

The following questions remain open or should be discussed:

- How can the right to informational self-determination be ensured in relation to smart metering and what experience has been gathered in other areas?
- What is the cost-benefit ratio for the introduction of smart metering? What useful applications are already available, in the planning stage conceivable, for consumers? How can the distribution aspects be included in the cost-benefit ratio?

6.4. Economy 4.0

The **production side** of the IoT in German-speaking countries is normally referred to as “**Industry 4.0**” and stands for the “fourth industrial revolution”. The idea behind this is: the “knowing” workpiece “knows” about itself, about its characteristics and its “life”. This makes “intelligent” production chains possible, from the raw material to the end product, by integrating suppliers through to customers via the Internet. However, this makes it clear that far more is involved than purely production companies. It is also a question of services, agriculture and more – it is a question of Economy 4.0.

The implementation of a wide variety of networking options and intelligent systems is already underway: however, it by no means covers the whole value chain and occurs mostly in pioneering companies, research or pilot projects, i.e. without blanket coverage. However, more extensive implementation of this type of production in many larger companies and of course in small and medium sized enterprises is expected. This will not happen abruptly – as the term “revolution” suggests – but successively.

One of the advantages quoted most frequently is that of an achievable **increase in efficiency**. For example, large storage areas will no longer be necessary in a production chain; raw materials can be used more sparingly and more efficiently - for example, when 3D printers are controlled directly. Only what is actually to be processed is requested and used. Digitisation and data exchange can minimise the occurrence of unnecessary residual products and waste. Energy costs can also be saved via automated optimisation. The time from conceptual design to the start of production will fall dramatically (for cars it has fallen from 10 years to 3 now).

Particularly in the field of production (Industry 4.0) proponents expect a significant **acceleration of labour productivity**: through a higher level of automation and often **automatically controlled processes**. Human labour will not become redundant in future as a result. However, the bottom line in net figures in the field of production cannot yet be calculated.

People will develop, optimise, use and control these new systems. This could create opportunities for additional jobs outside production – with new business models, products or even “**Services 4.0**”. It is certain that the broad implementation of IoT in the economy would bring about **massive changes in value chains, company structures, production processes and hence also work structures, work processes and qualification profiles**. The key technical precondition for comprehensive penetration is a massive improvement in data security.

Vision 7:

Expansion and fair distribution of employment

Vision:

An active and integrative economic and technical policy in Austria would utilise developments in the direction of Economy 4.0 to expand and ensure a fair distribution of employment. The chances for additional work via improved or even new products and services are utilised optimally by companies and supported effectively through economic policy.

The interlinking of the physical and digital world via the IoT and its advance into key areas of the economy, such as production but also the services sector, will increase around the world. It is neither possible nor desirable to disengage from this global development expected in the future. In the long term it would be linked to lower growth, job losses and a drop in income. Therefore it is less a question of “whether” and more a question of “how?”. “**How**” should be understood in the widest sense.

In our opinion the decisive economic factors are as follows:

The IoT and its application in the economy (production, services, agriculture) has the potential for extensive increases in efficiency and rationalisation measures through sophisticated production processes. A wide variety of approaches can lie at the heart of **corporate strategies** (increasing energy efficiency, optimisation of maintenance or logistics – for example, reducing the number of unloaded journeys, automation to reduce the percentage of wage costs, reduction of the amount of raw materials used, etc.). These approaches or their possible consequences can be viewed in different ways from the point of view of employees.

A second fundamental element that is linked to Economy 4.0 is **new products, services or completely new markets**. They are accompanied by **opportunities** to generate additional value and hence jobs. These opportunities must be used optimally, especially in sectors where attractive incomes can be expected, by companies but also by targeted economic measures.

New business models which lead to **massive upheaval in whole sectors** (disruptive innovation) are sometimes successful and pose a great challenge. Since many such new business models are based on networking effects, this can result in monopolist tendencies or a “**winner takes it all**” structure.

In any case the path to Economy 4.0 will be accompanied by various structural changes, for example in the **structure of employment, the structure of industry, effects on the regional economy, qualification profiles**, etc. Such changes must be seen in part as a precondition and in part as the result of this development – and will certainly represent a major challenge.

It is a question of using economic and social policies to support and guide all these changes while involving the relevant stakeholders – and **works councils** at the company level (see Vision 9).

Possible questions for research:

- A look back at structural change: sectors and employees – winners and losers of digitisation and penetration of the Internet in Austria since 2000.
- Future scenarios and their effects on employment, income, income distribution, growth and structural changes must be created. Courses of action for priority problematic areas and opportunities must be deduced. Does this result in better arguments for different forms of shorter working hours?

Vision 8:

Fair participation in gains in prosperity

Vision:

The successful development of Austria overall through Economy 4.0 to higher employment and higher incomes is used to open up new opportunities for the losers of digitisation and to offer a qualitatively improved social security system. Companies, employees, consumers and the public sector are ensured fair participation in the gains in prosperity and production through Economy 4.0.

Increasing use of the Internet of Things in the production sector or generally in the corporate sector will also see direct losers next to winners from this development. These groups/people are often affected positively as well as negatively. We will see both in companies, consumers, employees, as well as in the public sphere, social insurance organisations and other institutions.

Problematic consequences can reveal themselves in many ways – whether as increased risk, wage pressure, competitive pressure, higher qualification requirements, greater flexibility, blurring of leisure time and work, data protection problems, lower quality of workplaces, loss of income. With the continuous improvement in the expansion and higher quality of broadband communications networks themselves, software tools, platforms, etc., problematic developments will also become increasingly visible in addition to positive effects. We must remember the displacement of previously paid employment in the direction of informal or unpaid or badly paid work - for example in crowdworking or when consumption data are checked by consumers themselves or when they perform maintenance on devices or carry out banking transactions themselves.

Possible questions for research:

- How can implementation of Economy 4.0 in various scenarios affect the functional and personal distribution of income and subsequently the receipts of social insurance organisations and public budgets?
- What effects related to outgoings can be expected for public budgets and the social insurance system caused by expenditure on losers of digitisation?
- What possibilities should we consider in order to ensure that the winners of digitisation make a fair contribution to support the losers of digitisation?
- How can the opportunities of the sections of the population directly at risk from digitisation be improved in the long term and their quality of life guaranteed?

- Are changes to social insurance systems needed so as to be able to respond better to the demands of the IoT and increasing digitisation?

Vision 9: Inclusion of employee representation

Vision:

In order for employees, consumers and society to be able to utilise possible opportunities optimally and avoid negative developments, employees' representative bodies will be included from the start. Conditions are created jointly, technological options analysed and evaluated. Inside companies works councils and employees are included in the specific design and implementation of jobs and the organisation of work.

A note of caution should be sounded regarding the various forecasts on the quantitative and qualitative effects of the digital transformation, the IoT (Economy 4.0) on jobs. **They diverge markedly and do not stand up to careful study.** The majority start exclusively with the technical opportunities and their one-dimensional implementation, hence concluding with corresponding surges of rationalisation and automation and the substitution of man by technology. However, experience in the past has shown that the number and type of jobs is not determined by technical developments: technology merely covers the range of possibilities. In fact type, quality and number of jobs depend on many other conditions – not least inside and outside the company, i.e. social modelling processes.

Therefore it will be of decisive importance to **extend** the current **discussion** considerably, which focuses very much on **technical matters**. It should include questions relevant to society, influencing general conditions in this context, and it should include concepts to organise and influence technology with regard to its implementation within a company. Employee representatives and above all in-house co-determination via works councils will play an important role.

- Employee representatives must be included in fashioning general legal conditions on the road to IoT and Economy 4.0 from the very start.
- With the inclusion of experts from Austria and abroad, socially relevant questions, conflicts of objectives and priorities for the implementation of IoT must be discussed in employee representative bodies or publicly.
- Specific technical and organisational solutions for companies are also to be tested in publicly financed pilot factories/pilot plants. However, this should also require accompanying social research and include employee representatives or works council bodies and/or employees. Publication of the results of research and the corresponding transfer of knowledge to employee representative bodies must be guaranteed. The necessary funds must be provided.
- Legal regulations on co-determination must be formulated so that effective participation of works council bodies and of employees during the in-house introductory phase is made possible. Examples for the implementation of Economy 4.0 and the inclusion of works council bodies and employees must be analysed – best practice examples should be given.
- Furthermore, which effects of IoT on in-company structural change on works councils are conceivable should be investigated, also with regard to the further marked dislocation of employees.

6.5. Health, care, old age

The digital transformation will basically affect a wide variety of areas of life, including health and care. The growing need for medical and nursing care, which is primarily due to demographic change and the rise of chronic illnesses, poses new challenges for the healthcare sector.

Digitisation of the healthcare sector should primarily serve the quality of healthcare and the best possible quality of care while optimising health expenditure (see also the discussion on the catchphrase “economising”). The decisive factor is that the benefit for patients must come to the fore. Solving open questions regarding data security and data protection is of the utmost importance, particularly in the area of healthcare, because of the highly sensitive nature of data. However, the effects of the digital transformation on employees in the healthcare sector must also be investigated.

Vision 10: Self-determination and dignity in old age

Vision:

The digital transformation helps people to grow old while maintaining their self-determination and dignity.

Demographic change means that life expectancy is rising while the birth rate is falling; the baby boomers are reaching retirement age, mobility (new places of residence) is increasing and therefore older people are living in single-person households. **Greater independence** of older people and a reduction in institutionalised care are clear political aims because this ensures firstly a higher quality of life and self-determination and secondly it also reduces the costs of public and private care¹⁵.

The government pact 2013 to 2018 contains the following aim: “Independent care at home”. In order to achieve this aim, measures include the expansion of the application-oriented **ambient assisted living programmes** (technologies, products and services) with the emphasis on their long-term implementation.

“Ambient Assisted Living” (AAL) is an example of how growing old while maintaining self-determination and dignity is possible. By this is meant age-appropriate assistance systems for an ambient-assisted, healthy and independent life.

Examples AAL:

- smart toilets
- dry showers
- communication and social participation videophones
- transmission of vital signs
- intelligent house doors

¹⁵ See also: Technik und Menschlichkeit. AAL – Ambient Assisted Living und Assistierende Technologien im Bereich von Gesundheit und Pflege und Behinderung, Österreichisches Komitee für Soziale Arbeit (Technology and humanity. AAL – ambient assisted living and assisting technologies in the field of healthcare and disability, Austria Committee for Social Work)

- night lights with radio transmission
- monitoring cookers
- “Social robots” (e.g. Project Hobbit: robots with grippers to pick up objects from the floor, multi-mode touchscreen interface for telecommunications, a wide range of games and entertainment, simple internet access for important information).

AAL AUSTRIA is a platform founded on the initiative of the Federal Minister for Transport, Innovation and Technology in order to encourage the expansion of an Austrian AAL community and promote the visibility of AAL. The members of the AAL Vision Austria working group have compiled a joint position paper. The documents contain recommendations for action; the working group formulates – with an eye to the current situation in Europe and to innovative research approaches, as well as obstacles to opening up markets – specific visions for Austria that could be implemented by 2025. The aspects **“living in safety, well cared for, active and mobile”** form the core areas of Vision 2025. The number of single-person households will continue to increase in the coming years; active and/or automated communication is an important factor for security at home. **Smart home environments** can help to avoid dangerous situations. The catchphrase “well cared for” is understood to include, for example, the evaluation of health data of people with chronic illnesses. Social contacts can be better maintained by planning routes, leisure time and appointments.

Since 2011 households in test regions have been fitted with AAL technology in order to carry out longer-term evaluation. Of around 83% of people receiving a care allowance and who are looked after at home, 60% are looked after exclusively by family members. In only 19% of cases are additional care services required. Currently AAL is financed almost exclusively by those concerned. **If AAL is to become more readily accessible to the population, a form of public financing or benefits must be devised.**

Open questions:

- The question of financing for AAL remains open.
- Furthermore, various projects are still being created. Robots, for example, should be considered. Concerns could exist that personal contacts are lost with the use of a care robot.
- Furthermore, the question arises of what effect the use of care robots will have on the labour market or on employment quotas in the health and care sectors.
- It would also be important to ensure that the funds saved by the use of care robots are used for the benefit of insured persons in the health and care sectors.

Vision 11: Possibilities for patients

Vision:

The digital transformation offers patients the possibility of leaving the in-patient area earlier and returning to their familiar living environment, while maintaining a high level of care quality and security (telemedicine such as telemonitoring).

Telemedicine is understood by the BMG (Federal Ministry of Health) to be the provision or support of healthcare services using information and communication technologies (ICT) and where patients and health service providers (HSP) or two HSPs are not present at the same location. The prerequisite is secure transmission of medical data for the prevention, diagnosis, treatment and ongoing care of patients in the form of text, sound and/or images.

(http://www.bmg.gv.at/home/Schwerpunkte/E_Health_Elga/Telemedizin/).

Examples of telemedicine:

- Telemonitoring (distance monitoring of the state of health of patients)
- Teletherapy (where an HSP actively intervenes in the treatment of patients from a distance)
- Telecounselling (where a second opinion is obtained from a remote HSP and offered to an attending HSP, for example for remote appraisal in radiology)
- Teleconferencing (where a remote HSP can be called into ongoing medical treatment by another HSP).

Telemonitoring is especially suited for monitoring patients with cardiac insufficiency or diabetes. The high quality of healthcare can also be offered for patients at home via telemedicine. This supports an independent way of life for patients. Particularly with a view to the reform of the health system, **telemedicine can also help to reduce the time patients spend in hospital** and relieve the burden on outpatient units (also for aftercare) and in the intramural healthcare field. Shortening the time patients spend in hospital would have a beneficial effect on patients from the medical point of view. The higher risk of infection in hospitals should be considered here. Telemedicine makes high quality care possible at the periphery as well. Telemedicine helps to reduce the time between the start of ailments and requesting medical help, both in rural and urban environments.

A major problem that occurs with the application of telemedicine is guaranteeing data protection. **Health data are sensitive data** in the sense of Art. 4 Z 2 DSGVO (Data Protection Act) and as such require special protection.

Possible questions for research:

- What risks to patients' health can occur from implementation / introduction? Medication safety in the case of an internet-based chemist or risks arising from an incorrect diagnosis over the telephone must be considered.

Vision 12: Optimised processes and better networking

Vision:

Medicine 4.0 optimises treatment processes and results in better networking of healthcare service providers.

Medicine 4.0 means changing this **organisation of treatment into digital workflows**. Particularly in view of the introduction of primary care in Austria, tools such as ELGA as well as the general digitisation of health data should be seen positively.

If doctors and other health care professionals work together in the future in primary care networks, accessing patients' data will often be necessary. With EHLA hospitals, registered statutory health insurance physicians, chemists and care facilities will be networked in the future. This matches the concept of primary care that basically stipulates networking health service providers. **EHLA** is used to avoid double diagnoses and avoidable multiple examinations. Furthermore, patients can download their diagnoses and the medicines prescribed for them via the Internet. Health data are sensitive data. Therefore tools such as EHLA are especially important for their protection.

Open questions:

- Effect of digitisation on the healthcare sector with regard to employment in this field, effects on a possible shortage of doctors or care staff.
- Effects of Medicine 4.0 on the quality of healthcare services.

6.6. Cross-sectoral questions

Vision 13: Secure data in the Internet of Things

Vision:

Data communicated in the Internet of Things are secure (in terms of integrity) and cannot be manipulated and are sufficiently protected against unauthorised/unexpected use and dissemination.

Applications of the Internet of Things pose questions, both for companies as well as employees, regarding the security of data and the protection of personal/corporate data. The Internet of Things is only possible because the cost of disseminating information has dropped to almost zero. Consumers – but particularly companies – will only accept the Internet of Things if data can be securely protected from access, misuse and misappropriation. While the question of data protection always affects the original interests of employees and consumers due to the uneven distribution of power and data, the **question of data security emphasises more joint (public and private) interests** of the various interest groups participating in the economy. Information transferred between public and private tasks is especially sensitive; here a clear division between public and private sovereignty and usability must be drawn.

Possible questions for research:

- Data security in the Internet of Things
- What cases have there been of data espionage and data loss due to insecure applications (examples of cases or especially noteworthy cases)? What micro- and macroeconomic damage did these cases cause (either cumulative or individually)?

Vision 14: Traceable standards

Vision:

The final decision of shared architecture, standards and technical specifications for the Internet of Things will be taken by independent sovereign democratic bodies. Democratic authorities have sufficient expertise to understand technical developments and control them.

Standards are not always developed directly by legislative bodies / public institutions but on the basis of the work of private persons and turned into mandatory rules – in this context we also talk of the “**privatisation of legislation**”. Agreement to common standards is especially pertinent in the Internet of Things since this is the infrastructure with the new “currency”, the “new basis for value creation” and also for transporting sensitive information. Within the scope of Industry 4.0 missing standards are identified as a major challenge. There is a race towards standards between companies and between Europe and the USA. When closing this gap, the profit-oriented potential for innovation of private interest groups faces the public interest in an equitable and secure infrastructure. At the same time, companies will press ahead de facto to create standards.

Possible questions for research:

- Which resources do public institutions (ministries, universities) need so they can accompany and influence the development of standards? How are standards generally established, what role do free trade agreements play? How should standards institutes and standards development procedure be modified in a particularly dynamic environment? How will transparency and surveillance be ensured in standards development or standardisation procedures (international examples)?

Vision 15: Participating in society without the Internet of Things

Vision:

Irrespective of the reasons why, anyone who is not (yet) capable of using applications of the Internet of Things can still participate in society. In the medium term the needs of consumers will take centre stage, thus creating a win-win situation for consumers and companies.

The acceptance of technological innovations and new services **can be encouraged by an open information and communications culture**. Costs and benefits, opportunities and risks have to be addressed openly by decision-makers and institutions/companies involved and should not be presented in a one-sided manner.

Some time ago industrial associations forecast that from 2020 self-communicating devices will be made mandatory by law (e.g. ITU, 2005). These forecasts can be found to some degree in the political debates about smart metering (in Austria) or connected cars (EP resolution). Particularly the mandatory introduction of smart meters (see above) in Austria is a cautionary example for other digitisation measures. Household consumers had their “luck forced upon them”; the cost-benefit ratio was presented in a one-sided manner and privacy concerns were ignored initially.

Possible questions for research:

- Which areas of application of the Internet of Things are already mandatory?
- Which interest groups agitated most for them as a result of the various legislative processes?
- Who bore/is bearing the costs for this mandatory use?
- What studies are available on customer acceptance of new services (e.g. energy)?

