1. BASICS DIGITISATION AND WORKING ENVIRONMENT 4.0

1.1   The topic

The first introduction

Our business and working environment is changing: In factories, robots and machines are taking on more and more tasks, in offices IT specialists are in demand who can operate and maintain new types of technology, and in supermarkets automatic pay stations are replacing staff. But what effects does the ongoing digitalisation have on our society and what advantages and challenges are associated with? Do we really have to fear that we will be completely replaced by machines and robots in the future, or does the Working Environment 4.0 also offer us completely new possibilities and opportunities?

The practical relevance - for this you will need the knowledge and skills

Digitisation and digital transformation have become an integral part of our modern society. Whether students use an e-learning platform, employees in an automobile factory work together with robots or translators work on a text created by a machine translation program - Working Environment 4.0 is already a reality. It is therefore very important for all the workers of the future to have a basic knowledge of it.

Learning objectives and competences at a glance

This learning unit teaches you the basic concepts of digitisation, you will learn more about the history of the industrial revolutions and gain an insight into the challenges and opportunities that digitisation and digital transformation present for companies and individuals. In addition, you will learn which skills will be in demand on tomorrow's job market and which activities are likely to take a back seat in the future. This basic knowledge will help you to better understand the working environment of the future and to make the best possible use of the opportunities and possibilities of digitisation.

Learning Objectives
Explain what is meant by digitisation.
Know what an industrial revolution is and which industrial revolutions are distinguished.
Know how companies can successfully use digitisation.
Know what Working Environment 4.0 means for employees.
Know what the working environment of tomorrow could look like.

1.2   What is Digitisation?

How would you explain digitisation? Do you associate it with the digital processing and playback of a sound on a CD? The use of robots on an assembly line? Or even the apparently "intelligent" action of characters in a computer game? Perhaps you have already noticed that although there is constant talk about digitisation, the term is still a bit fuzzy and hard to grasp for many people.

Properly speaking, **digitisation** is only the digital processing and reproduction of information, for example in a video or on a PC - analogue information such as images or sound is stored in digital units. In our language, however, digitisation is often equated with digital transformation or automation.

In our world it happens constantly that analogue signals are converted into digital signals and vice versa. But do you actually know what the **difference** is between an **analogue** and a **digital signal**?

An **analogue** signal is infinitely variable and can transport more than one unique piece of information. This includes, for example, the chirping of a bird, the singing of a person, the display of a clock with a dial or a photo in an album. These signals have in common that their quality decreases with time (e.g. photos turn yellow) and they cannot be transported spatially well.

Digital signals, on the other hand, contain information that can be clearly identified. It can always be reproduced with the same quality and transported spatially without any problems. These include, for example, an MP3 file on which music is stored, a watch with a digital display or scanned and digitised photos that are stored on a PC. The quality of the files does not decrease over time, the photos can be printed out again and again in the same quality and the music can always be played with the same quality.

Here you can see how a cash register with analogue display looked like:

Digital transformation refers to the introduction of digital working methods and programs - the processes set in motion by digitisation.
Directly connected with the digital transformation is also the **automation** of individual work steps or entire processes. Here, machines, plants or equipment carry out work steps or entire processes independently.

Artificial intelligence plays an important role here: a machine, a robot etc. is built in such a way that work steps can be carried out independently and problems can be solved. In computer games, for example, human intelligence is imitated by algorithms so that game characters "seemingly" react intelligently.

Definition
Digitisation
...originally only stands for the **digital processing and representation of information**. In our language use, however, it is often also understood as **digital transformation and automation**.

Definition
digital transformation
...describes the **changes in society caused by digitalisation**. This also includes the **automation of work steps and processes.**

Digitisation (create a CD or a video, record information on the PC...) ->   leads to
Digital transformation (automation, use of computer programs, creation of artificial intelligence, shopping on Amazon...)

Example
Mr. Weber has been working as a cashier for a well-known supermarket chain since 1990. His cashier digitally displays the numbers he has entered and calculates the final amount. **Digitisation** has thus already been completed. When the first automatic pay stations are tested, in which people scan their goods themselves and then pay directly at the machine, Mr Weber is initially sceptical. What will this mean for his daily work and is he still needed at all? The replacement of these old cash registers by new automatic pay stations with digital display and scanning device can be described as **digital transformation**. The fact that these cash registers independently display the amount due, cash in and give remaining money after the individual products have been entered is called **automation**. In the meantime, Mr. Weber has found his way into his new position: He now helps customers who have problems with the vending machine. And these are manifold: Some products are not so easy to scan, sometimes there is an error message because the goods have not been put down correctly, moreover, when buying alcohol a person still has to check the age of the customers and much more. At peak times, Mr. Weber continues to sit at the checkout himself, and he also takes on management tasks. Mr. Weber has arrived in the Working Environment 4.0, where fortunately human skills are still needed. Nevertheless, the number of staff employed in the business can generally be reduced by the changes.

But who exactly is affected by digitisation or the digital transformation and in what way?
A distinction can be made here between companies, individuals, science & research and the state, which together are referred to as **actors in digitisation:**

- **Company**
  Companies use robots on the assembly line, for example, to increase productivity, or automatic pay stations in **supermarkets** to reduce personnel costs. For a supermarket chain, for example, digitisation therefore means, on the one hand, that work processes can be made more efficient, thereby saving costs, but also that it must always be kept up to date in order to keep up with the competition.

- **Individuals**
  When processes in a company are digitised, it is usually individuals who are affected. The cashier in the **supermarket**, for example, is given a new task or is dismissed if automatic pay stations are used. But it also **affects managers**, such as the **CEO of a mobile phone company**, who has to come up with a new strategy to develop an affordable smartphone.

- **Science and research**
  Science and research deal in detail with digitisation processes, new computer programs, machines and robots are being developed. At **universities**, for example, digitisation is also viewed from an ethical perspective by examining the effects of digitisation on our society and how best to deal with them.

- **State**
  Finally, the state is also involved in digitisation: For example, the **Federal Ministry for Digitisation and Business Location** issues laws and regulations for the implementation of digitisation. Examples include the ordinance on digital signatures, which can be used to sign documents online, or the law on the protection of personal data such as date of birth, car registration plates etc.

1.3   The industrial revolutions at a glance

Surely you have heard something about the Industrial Revolutions. Perhaps you're thinking of:

- the invention of the steam locomotive
- Henry Ford and the first mass production of cars
- the first PCs
- the networking of robots

These are all essential innovations that have taken place in the various industrial revolutions. But let us first look at what distinguishes an Industrial Revolution:

Change is normal and natural in a society, as is **progress**. From the late 18th century onwards, phases in which there were groundbreaking advances in production, such as the introduction of steam-driven spinning wheels or assembly line work, are known as **industrial revolutions**.

A characteristic of the industrial revolutions are **changes in the living conditions** of the people. New production technologies such as the steam engine or the PC had a profound impact on the economy and society. Both employers and employees had to adapt to the **new conditions**.

Definition
industrial revolution ...describes major advances in production that lead to changes in economic and social conditions.

A distinction is made between **four industrial revolutions**, which are classified according to **industry 1.0 to 4.0.** Currently we are in the Fourth Industrial Revolution:

1784	1870	1969	2010
Industry 1.0	Industry 2.0	Industry 3.0	Industry 4.0
Mechanization	*Elektrification*	*Production Control*	*Networking*

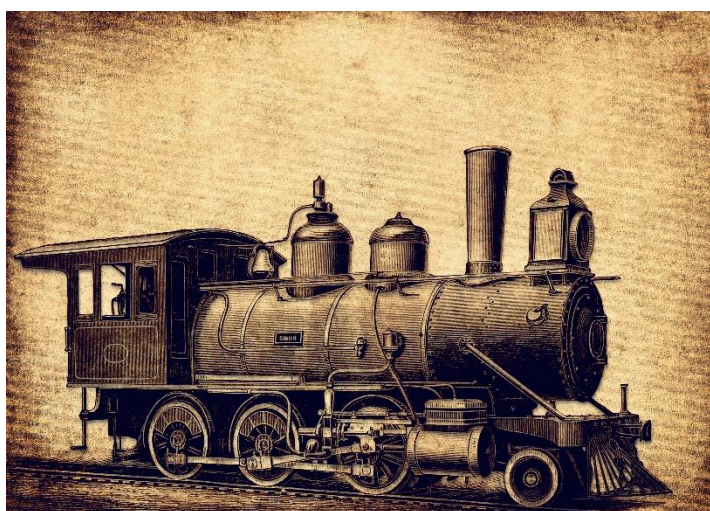**The First Industrial Revolution - Industry 1.0**

- **Mechanisation**
- **from 1784**

The **steam engine** was introduced into the factories, looms or spinning wheels were now no longer driven by muscle power but mechanically by steam power. This meant that much more could be produced in less time and with less effort, and **new jobs** were created in the factories for the people.

In 1802 the British **Richard Trevithick** built the first **steam locomotive**. However, this was not functional, as the cast-iron rails of the horse-drawn tram were not strong enough. Only a few years later the first steam locomotive went into operation - on suitable rails. A few years before that, the first steam ship had already been **developed**.

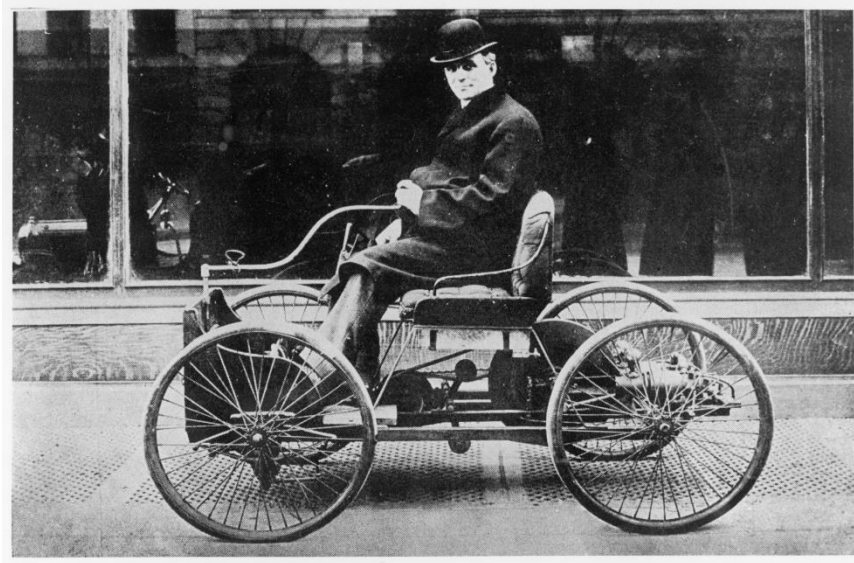| Remember |
| --- |
| The most important innovations of the First Industrial Revolution are mechanical production plants that were powered by water and steam (e.g. looms and spinning wheels), the steam locomotive and the steam ship. |

The Second Industrial Revolution - Industry 2.0

- **Electrification**
- **from 1870**

Electricity was discovered and introduced as a driving force and the first **assembly lines** were introduced in factories: The American **Henry Ford** took the idea of the assembly line from a slaughterhouse and introduced it in 1913 for the production of his cars: The car parts were manufactured on the assembly line, several workers **shared** the **work steps**.

Production became **faster and cheaper** and more and more people could afford a car. As the car went from being a luxury good to a mass product and more and more cars were produced, there were also more and more **jobs** in the factories.

In addition, the **telephone** was invented, the manufacture of **clothing** became increasingly automated and the American Thomas Alva Edison invented the **light bulb** in 1879.

Remember
The most important innovations of the Second Industrial Revolution are **mass production** through **electricity**, **assembly line work**, the **telephone** and the **light bulb**.

The Third Industrial Revolution - Industry 3.0

- **Production control**
- **from 1969**

The first programmable **controllers** were invented, which led to individual **work steps being automated** and being able to be performed **without human "help"**. A good example of this are **robots** that vacuum independently. The factories urgently needed programmers who could operate these controllers.

One of the **first robots** was invented in California in 1972. It was already able to sense and feel its surroundings and move around. Because it was still quite wobbly on its legs, it was called **"Shakey"**.

The **first computers** were huge and unwieldy calculating machines, but were quickly refined. In 1982 the **PC** (Personal Computer) became attractive for private households when the legendary Commodore C64 was launched.

Remember
The most important innovations of the Third Industrial Revolution are the further **automation and control of production** using electronics and IT and the first **robot**. In addition, the **PC** finds its way into private households.

The Fourth Industrial Revolution - Industry 4.0
- **Networking**
- **from approx. 2010**

Industrial production is becoming increasingly digitalised and **modern information and communication technologies** are being used. These are **networked** with each other in order to **automate** not only individual working steps, but entire **processes**.

In automotive plants, **robots** capable of solving problems independently are already being used for assembly. In the new digital factories, **plants are networked with each other**; production systems, components and people communicate with each other.

Computers are able to **learn from experience** by this time, for instance nowadays there are self-driving cars that learn from the driver and can **make decisions** such as braking or accelerating **independently** after a few days. They can also **network** with mobile phones and other devices.
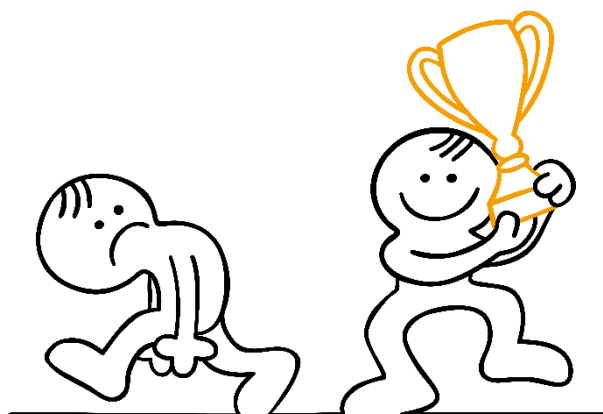
Remember
The most important innovations of the Fourth Industrial Revolution are the increasing **digitalisation of production**, the **networking of intelligent systems** and the **interaction between man and machine**. **Computers** can now **learn** from experience (e.g. self-driving cars).

1.4   Digitisation in companies

We have already seen that digitisation implies numerous **changes**. In this chapter we will focus specifically on how **companies** are affected.
In the following, you will learn about the **opportunities and challenges** that digitisation brings to companies and which aspects they must pay particular attention to. You will also learn more about the **winners** and **losers of digitisation**, because when it comes to digitisation, the following applies

You have to move with the times, or the times move you!

Let us start with the **advantages** that the use of **digital information and communication technologies** implicates to companies:

You've probably all bought something online at some point and know the many benefits that you, as a customer, enjoy - you save time and stress and possibly money because you can compare offers online. As a result, **customer satisfaction increases**.

As the new technologies make working steps more efficient or automate them, the performance of the company can be **increased**. Employees are also more flexible, meetings can be held via video conferencing, etc. In addition, **manpower can be saved**, which **reduces** the company's **personnel costs**.

The new technologies also enable **new business models**, such as online shops or the delivery of food that can be ordered online.

Remember
In summary, **digitisation** offers companies the following **advantages**:   - more satisfied customers   - increase in performance   - cost saving   - new business models

Winners of digitisation

If a company succeeds in making smart use of these advantages, it is one of the **winners of digitisation**. A good example is the online mail order company **Amazon**, which displaced established mail order companies such as Quelle from the market with an innovative online concept involving intermediaries.

You probably know many other **winners of digitisation**. For example, **Uber**, an agency service that offers online possibilities for transporting people, or **Airbnb**, a marketplace that offers accommodation on an online platform for short- or long-term stays.

Another well-known winner of digitisation is the hard- and software developer **Apple**.

Example
In 1967, Steve Jobs and Steve Wozniak founded Apple Computers Inc. in California together with their friend Ronald Wayne. The trio worked on the first **personal computers (PCs),** but soon realised that innovative ideas were needed to prevail against competitors such as IBM. In 1984, the company had great success with the development of the **Macintosh (Mac)**, which could be controlled with a **mouse** and had a **graphical user interface** - both innovations on the market.

Finally, in 2007 the **iPhone** was introduced with great success - a **phone** with a new type of **touch screen** that can also be used as an **"Internet communicator"**. Despite initial technical problems such as congested mobile phone networks, Apple never allowed itself to be diverted from its vision. The customers were soon convinced: Apple dominated the mobile market for smartphones and tablets for years and is still one of the most valuable brands worldwide.

The example of Apple shows that companies need both a **sense for trends** and **inventiveness** as well as the **courage** to introduce a promising innovation, even if there is a risk of **failure**. This brings us to the challenges that companies face in course of digitisation. In the following section, we will take a look at the **challenges** that companies must face in case they want **to be among the winners of digitisation**.

Challenges of digitisation for companies
In order to keep up, a company must develop a **suitable strategy**, which should also be communicated to the workforce. After all, especially regarding digitisation, staff need orientation and security.
Flexible working time models or the possibility of **working from home** should also be offered, as the new technologies simply allow this. In addition, investment should be made in **new information and communication tools** and in the training of workers to enable them to use the new technologies.
Finally, **legal requirements** must be considered, in particular with regard to data protection, as new technologies raise many questions in this respect. Therefore, larger companies often already have their own data protection officers.

Example
So, what does it actually mean for a smaller clothing store that you can suddenly buy everything online? The manager may decide to set up an online shop to offer customers the same benefits as a large online mail order company. He has already drawn up a strategy and is investing in a restructuring: fewer sales staff will be needed, but several new people will be needed to set up, operate and maintain the online shop. Of course, the applicable data protection guidelines must also be observed. Some employees will be retrained, others will be newly hired.

Remember
In summary, the **challenges of digitisation for companies are**: • designing an appropriate strategy • offering flexible working time models and home office • investment in new information and communication tools and training • legal compliance

Losers of digitisation

Companies that do not realise in time that it is time for change, or simply do not have the courage to do so, are among the **losers of digitisation**.

You are probably familiar with **Kodak**, the former world market leader for photographic equipment. Afraid of jeopardizing its classic film business, Kodak was slow to develop digital technology. Too slowly. Because after 2000, the traditional film business collapsed. Kodak was no longer able to catch up with digital photography and had to file for bankruptcy in 2012.

Quelle, formerly Europe's largest mail order company, also failed to make the transition to digital because it entered the online trade too late. Another example of a loser from digitisation is the Finnish mobile device manufacturer and former world market leader **Nokia**.

Example
In the 1990s, Nokia had already developed a **smartphone** before Apple. However, Nokia did not bring the device onto the market. The reason for this was the misconception that the device was **too expensive in production** and that consumers would not be willing to pay the price for it. In addition, it became publicly known afterwards that at that time there was a very **bad working atmosphere** in the Nokia Group, which was mainly characterised by **fear of making mistakes**. Some of the employees were so afraid of losing their jobs that they falsified the results of studies in order to satisfy the managing director. When Apple successfully launched the **iPhone** on the market in 2007, it was too late for Nokia - the company was no longer able to make the transition. After Microsoft, HMD Global took over the company and today has moderate success.

To sum up:

If a company wants to be among the winners of digitisation, the following things are particularly important:

- a corporate climate that promotes innovation
- long-term thinking
- a culture of failure

Anyone who prefers to discuss and test his promising product for months instead of simply testing it on the market, and thus **consciously risking failure**, will be left behind. In a business world that is subject to increasingly **rapid change**, time should not be wasted on **unnecessary doubts.**

1.5 The new working environment from the perspective of the employees

In addition to the companies, it is particularly the **employees** who are affected by the changes brought by digitisation. Many people are insecure, others have already adapted to the changes or even benefited from them. In the following unit we will investigate the question of what the **"new way of working"** in a **Working Environment 4.0** actually means for **employees**.

What do you understand by **Working Environment 4.0** and **New Work**?

We have already heard a lot about the Fourth Industrial Revolution and we also know that it is still going on. Working Environment 4.0 now brings together all the forms of **work** and **working conditions** of the **Fourth Industrial Revolution** or **Industry 4.0**. The characteristic feature of Working Environment 4.0 is above all **digitalisation**. Processes are **digitally supported** and sometimes **completely automated**, many people work **independently of time and place**, and the entire economy is **networked**.

In the **Working Environment 4.0**, employees often spend a large part of their working time with **digital work** on the **PC**. Employees in production often only operate IT systems to control the machines that do the actual work.

Of course, there are still jobs that are carried out **manually**, i.e. **using the hands**. Hardly anyone will want to have their appendix removed by a **robot**. **Robots** are already making inroads into the **operating theatres** too. However, so far only as **assistants**, as the work of a surgeon is simply **too complex** to be fully automated.

The term **New Work** is used when talking about the **impact** of **digitisation** on the **work environment**. The main point here is that workers are free to organise their work according to their own wishes and needs. This includes, among other things, the **flexibility in terms of time and place** that working from one's own PC entails.

Definition
Working Environment 4.0
...describes a work environment that unites all **forms of work** and **working conditions** of the **Fourth Industrial Revolution** or **Industry 4.0** and which is mainly characterised by **digitalisation**.

Definition
New Work ...describes how **digitalisation affects the work environment**. This includes in particular the **freedoms** that **employees** have in **shaping** their **working conditions** in the new work environment.

Advantages of the Working Environment 4.0 for employees

These new developments offer numerous **advantages** for employees. More and more companies are offering work from home, from the so-called **home office**. Employees can thus better **combine work and family** life and be at home when their child is ill, for example. Traveling is no longer necessarily limited to holidays; in theory, it is also possible to work from a beach in Thailand - as long as the Internet connection works, of course.

Thanks to new information and communication technologies such as Skype, **communication** between employees and superiors is also possible via **chat or video conferencing**. This means that staff do not always have to be present in person at meetings, for example, which often involves travel. This can save time and money.

On the other hand, employees are **responsible** for **planning** their working hours according to the needs of the company and must ensure that their work is completed on time. This greater **personal responsibility** is a motivation for many people to work with greater commitment, but can also become a burden.

In addition, **new working models** are emerging, for example, more and more companies are outsourcing individual work steps to freelancers, who perform them independently of their own PCs, both in terms of time and location. Translation agencies often employ freelance proofreaders to check texts for errors from their own PCs.

Remember
In summary, Working Environment 4.0 offers employees the following **advantages**: • flexibility of time and place, better compatibility of work and family life and easier planning of trips, leisure activities etc. • digital communication with colleagues and managers • greater individual responsibility • new working models

But where there is much light, there must also be shadow. Because the Working Environment 4.0 demands a great deal from employees. In the following, you will learn about the **challenges** employees face in the Working Environment 4.0:

Challenges of the Working Environment 4.0 for employees
For many employees, digitisation means especially one thing: **uncertainty**. Many people fear that they will be **replaced by a robot** or that their area of responsibility will change in such a way that they will have to acquire completely **new skills**.

However, in contrast to companies, less courage is needed here, but rather **adaptability** and **flexibility**. But beware: If a company offers its employees work from their home office, for example, but in return requires that they are available outside of regular working hours on agreed days, there should be clear rules for this that are compatible with labour law.
Permanent availability is the downside of this better reconciliation of work with family and leisure. After all, those who are allowed to take time during the day for children or leisure activities will also have to accept sitting in front of the PC in the evening when others have finished their work long since.

The fact that you no longer meet your colleagues in the office everyday can also lead to **social isolation**. Good **time management** is also a must, so that the dream of flexible working does not become a nightmare that ends in burnout.

The **pressure** on employees is increasing. In many cases, not only constant availability is expected, but also the **tasks** of the employees are becoming **more extensive and complex**. In addition, some employees also live in constant fear of soon being completely replaced by a computer.

What is important in any case is modern **IT equipment, further training** and the willingness to engage in **lifelong learning**. After all, if a company uses new computer programs, its employees must also be able to work with them.

Freelancers need to keep up with the times to be familiar with the latest programs and systems in their industry. Here, too, **personal responsibility** is required to be successful in the Working Environment 4.0.

Remember
In summary, the Working Environment 4.0 poses the following **challenges** for employees: • flexibility vs. permanent availability   • increasing pressure on employees   • social isolation

- time management
- modern IT equipment
- continuing education and lifelong learning

But what is the **reality in Europe** and what influence does the **degree of digitisation** of a country have on its competitiveness?

Already in 2016, a comparison by the European Commission shows that the **competitiveness** of countries (measured e.g. by income per capita, productivity or human capital) is directly related to the degree of digitisation. Accordingly, countries with a high degree of digitisation achieve a high income per capita.
A Commission report of 2019 also shows that investment and determined **digitisation efforts** will boost Member States' performance. However, the degree of digitisation in **Austria** (measured by the level of development) is **below average** compared to other EU countries, with the Scandinavian countries, the Benelux countries and Ireland leading the way. In some individual areas, however, Austria also performs quite well:

For example, Austria is ahead in the **digitisation of public services** and **digital skills and competences**. There is a need to catch up in the areas of **connectivity and Internet use**, and the **availability of fast broadband connections** is often not up to date

1.6   The work environment of tomorrow

The question that probably occupies employees and trainees the most is: What will my **workplace** look like in the **future**? After all, as already mentioned, many people are unsettled by **digitisation** and the **changes** it has brought along with it. Which activities will still be in demand in the **work environment of tomorrow** and what **role** will **computers** and **robots** play?

Studies show

Much hype about a study

In 2013, the two Oxford University researchers Carl Benedikt Frey and Michael A. Osborne published a study on the **future of the work environment**, that frightened many people: The study stated that **47 percent** of all **jobs** in the USA run the risk of being **automated** in the next 10 to 20 years (see Frey and Osborne (2013): The Future of Employment: How Susceptible Are Jobs To Computerisation?, Oxford Martin School (OMS) working paper, University of Oxford, Oxford).

However, a study by the **Organisation for Economic Cooperation and Development (OECD)** from 2016 showed that these fears are unfounded and states that in the **21 OECD countries** studied, only an average of **9 percent of all jobs** can be **automated**. For Austria the percentage is **12 percent** (Arntz, Gregory and Zierahn (2016): The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis, OECD Social, Employment and Migration Working Papers No. 189, Paris)

In order to be able to make a **forecast for the future**, it is useful to first look at **developments** in the **recent past.**

For a better understanding we divide the activities into six different categories:

- **analytical activities** (activities that require abstract thinking, such as making a forecast for market research)
- **interactive activities** (activities involving other people, such as selling shoes)
- **cognitive activities** (activities that require cognitive processes such as remembering, learning, comparing, etc., for example, translating a text)
- **manual activities** (activities carried out by hands, such as planting vegetables)
- **routine activities** (activities involving a large number of repetitions, such as assembly line work)
- **non-routine activities** (diversified activities, in which one must always adapt to new circumstances)

Can you imagine which activities have gained in importance in recent years and which have become less important? The following chart shows the development since 1995:

Analytical cognitive non-routine activities such as

- research
- elaborating rules
- controlling
- singing

Interactive cognitive non-routine activities

- Negotiating
- coordinating
- marketing activities
- training

Cognitive routine activities such as

- calculating
- correction of texts
- preparation of the accounts
- mechatronics

Manual non-routine activities such as

- renovate houses
- therapy (manual)
- restauration of art
- craft activities such as carpentry

Manual routine activities such as

- Producing
- operating or controlling machines
- harvesting of cereals, fruit or vegetables
- food cultivation

Remember
Manual activities and **routine activities** (with the exception of **cognitive routine activities**) have become less important since 1995 and it can be assumed that this **trend** will **continue** or even **increase** in the **future**. However, **analytical** and **interactive cognitive non-routine activities** are becoming increasingly important.

Jobs with a future

The best measure against unemployment is still **education** - around two thirds of all jobs at risk from digitisation are jobs for **unskilled workers**, **craftsmen and women or service providers**. The higher the level of education completed by the workforce, the lower the probability that their activities can be fully automated.

Social and creative professions such as teacher, graphic designer or nurse are likely to gain in importance. There will also be an increasing demand **for management** jobs such as project management or controlling and **technical jobs** or jobs that require strong **fine- motor skills**. Employees in the following areas will therefore continue to be in demand in the future:

Social professions:
- doctors and physicians
- teachers
- nursing staff and managers
- social workers

Creative professions:
- graphic artists
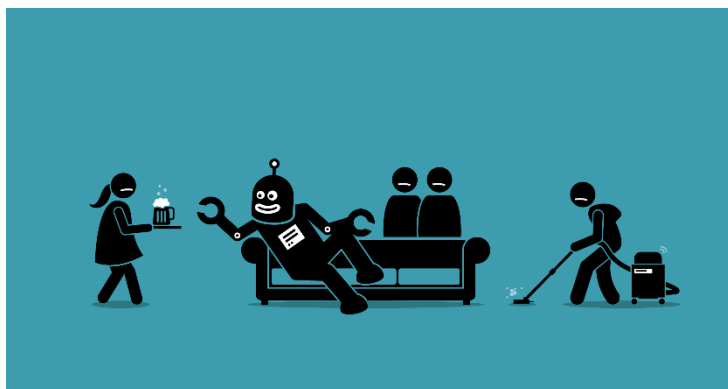- copywriters
- social media managers

Careers in management:
- controlling
- project management
- customer management and support

Technical professions:
- mechatronics engineers
- IT project managers
- IT security experts
- food technologists

Future scenarios

or

How do you specifically imagine the **work environment of the future**? Do you see **people** as **subservient servants** of the **machines** or do you dream of a world in which the **machines** are **faithful assistants** to **people** and help them to new heights?

In fact, there are both positive and negative predictions for the future with regard to the **interaction between man and machine**: It could be that more and more automation will be introduced, the **machines** will control themselves, and only "menial" activities (e.g. in the warehouse) will remain for the **humans**. It is, however, more desirable that **IT assistance systems** provide good service to **highly qualified specialists** such as doctors, but that decisions continue to be made by humans.

It should not be forgotten that humans have **creativity, feelings, passion, imagination, respect, opinion** and the ability to **handle unforeseen situations**, and are thereby still far superior to robots in this areas. The fact that there is still no way around digitalisation should already have been made clear in this unit. However, how it is dealt with in practice is left to society and thus to each and every one of us

1.7   Summary

Digitisation and **digital transformation** - the digital processing and representation of information and the changes triggered by it, such as the **automation** of work and the development of **artificial intelligence** - are omnipresent today and involve both uncertainty as well as opportunities and possibilities.

However, **change and transformation** in society is quite natural. It is actually impressive that we have made it over the past 250 years, from the **First Industrial Revolution** and the invention of the steam engine to **Industry 4.0** and networked vehicles.

Digitisation is an important factor in being **competitive** today. This applies to individual employees as well as to companies and entire countries. While companies need to be innovative, quick to implement and courageous in order to keep up, employees need to acquire the skills that are needed in the Working Environment 4.0.

For **companies**, successful implementation of digitisation means improved performance, cost savings, the emergence of new business models and more satisfied customers. However, they need to pay more attention to data protection rules, design an appropriate digitisation strategy, invest in new information and communication tools, and provide appropriate training and flexible working conditions for employees.

Employees benefit from being more flexible in terms of time and place, being able to better combine work and family life and not having to take company holidays or similar factors into account when planning their travel. In addition, digitisation gives them more personal responsibility. However, this also means increasing pressure. The knowledge of having to be constantly available and the increasing blurring of working hours and leisure time can lead to a decline in quality of life and, in the worst case, to burnout. Employees are also called upon to make their own efforts in terms of lifelong learning and modern IT equipment.

With regard to the **labour market**, it is important to know that **manual activities** will tend to become less important in the future, whereas **cognitive activities** will become more important. In addition to IT specialists, there will also be a great demand for nurses, medical staff, teaching staff and technicians in the future. It is difficult to predict what the **future of digitisation** will look like. Nevertheless, it is obvious that we are all called upon to help shape it.