THE LABOUR MARKET IN THE HUNGARIAN REGIONS IN 2035

Labour and skills supply in different regions of Hungary - trends and challenges

Analysis of the results of the questionnaire survey

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Summary

In co-operation with the Confederation of Hungarian Employers and Industrialists (MGYOSZ), we have tried to make our questionnaire representative in several respects. This has been achieved relatively well despite the small number of elements. All regions and sectors are represented to a greater or lesser extent in our sample, depending on their economic weight, and as far as the number of employees is concerned, we can say that, unlike other similar surveys, large companies are represented in sufficient numbers in our survey. Unfortunately, relatively few truly export-orientated companies were included in our sample, and the number of foreign- owned companies is well below the national average.

We had several respondents from companies that employ temporary workers. Of these, the highest share of temporary workers is to be found *in labour market services*. The share of temporary workers who have been or can be loaned out to other companies is over 90%. This suggests that companies that "buy" workers to perform productive work through temporary employment agencies prefer this to complying with obligations under various labour laws and perhaps also strategic contracts providing for certain subsidies. *The employer of temporary workers is the temporary employment agency and not the company where the actual work takes place.*

It is no coincidence that temporary employment agencies are the most satisfied with their current situation and future prospects, followed by manufacturers of rubber and plastic goods, paper products and food. The most pessimistic respondents represent the construction industry, the scientific and technical professions and the printing and reproduction industry.

It is much more difficult to find labour now than it was before the pandemic. While before the pandemic, more than a quarter of respondents said they had found a new unskilled job almost immediately, only 11% are now in such a favourable situation. For jobs requiring a secondary vocational qualification, the 10% rate has halved, while the 20% rate for jobs requiring a vocational qualification based on a school-leaving certificate but not a university/college degree has fallen to 7% and the 15% rate for jobs requiring a university/college degree has fallen to 3%. While only a small share of respondents stated that they were unable to find suitable staff at all before the pandemic, this now applies to an increasing number of respondents. It is particularly worrying that an average of 8% hold this view for jobs that require a secondary school qualification.

Looking at the problem in a regional context, we see that most of our respondents who were unable to find new employees with a secondary school qualification or without a qualification, or who only found them after a year or so of searching, represent companies in the Western Transdanubia region. (This is most likely due to the pull effect of the national border.) However, the most frequent complaints about the lack of university/college graduates came from companies in the Northern Great Plain and in Budapest. According to our respondents, *more than half (51%) of applicants for jobs requiring a university/college degree are now demanding higher salaries than companies can afford*, compared to "only" 36% before the COVID-19 pandemic.

There is only one area where they expect an improvement in terms of their expectations of a *qualified* labour force. This is the *mobility readiness of the workforce*, which 37% of our respondents believe will be better in their company in the next ten years than it is today. In the other areas, only a small share of them expects a certain improvement. Compared to the current situation, only 6% of our respondents expect an improvement in the skills, experience and expertise of the workforce, only 5% expect an increase in the ability to work (given the averageage and health) and 4% expect a strengthening of loyalty.

At the same time, the share of those who expect the current situation to deteriorate has reached an alarming level. 74% of respondents believe that the loyalty of employees in their companies will deteriorate, 71% believe that employees' salary expectations will worsen in relation to their productivity, and 64% believe that employees' skills, experience and expertise will fall below current levels.

Similar expectations are found for *non-skilled jobs*, with the difference that the proportion of "I don't know, no answer" options was very high. Almost a third of respondents believe that the situation is so uncertain that they are unable to take a position. This segment also has the most

positive expectations in terms of mobility readiness, and the greatest concerns here too relate to loyalty, expertise and salary expectations.

According to analyses, more than half of today's professions and jobs did not exist half a century ago. In addition, around 40% of the jobs carried out 50 years ago no longer exist today. To introduce the section on jobs of the future, we asked respondents to travel back in time. We wanted to know how important they think some of the activities we consider important will be for their company and the local economy in ten years' time. It is striking that the respondents rated *all activities as more important for the national economy than for their own company.*

The expected significance for their own company and the Hungarian economy shows the greatest difference in *software development*: While this achieved the highest average score of all activities, it had one of the worst average scores for their own company. In terms of importance for their own company, *HR management* and *product development* received the highest average scores. *Sales* and the *use of cloud services* were not far behind.

For the jobs of the future, we also gave respondents the opportunity to say in their own words what they think could still be important in the next decade. *Most respondents cited the rise of artificial intelligence (AI) and the rapid utilisation of its potential applications*, both in general and in their own fields. Big data, the data economy, robotics and automation were also mentioned in various contexts. The importance of utilising the potential of innovation and digitalisation, particularly in project management-intensive sectors, was likewise mentioned several times. The importance of environmental protection and waste management/recycling was also emphasised by several respondents.

Finally, we asked respondents to select from our list the skills they believe will be most needed in their workplace in the future. Two very similar professions, *data analyst* and *business intelligence developer*, received the most votes, followed by *cloud engineers* and then jobs related to *business development, the optimisation of production processes and sales*, all of which use the achievements of digitalisation to streamline these activities.

The survey revealed that companies wanted to hire new employees in the years before 2020 in order to expand their production. At regional level, there were no significant differences between the companies: Regardless of the region in which they are based, they found it equally difficult or easy to recruit staff. Large companies (with more than 250 employees) differ somewhat from the others, as they had a much higher turnover of employees.

There is no difference in the labour supply by qualification level. If there were recruitment problems at one qualification level, these are usually also reflected at other qualification levels. The mismatch between salary expectations and experience was a problem. There were regional differences in the problems that companies were most confronted with. In Budapest and Central Transdanubia, the high salary expectations of university graduates posed a problem, while in Western Transdanubia and Northern Hungary this applied more to high school graduates.

The situation on the labour market changed after the pandemic. Western Transdanubia, Budapest, Southern Transdanubia and the Northern Great Plain are in a similar situation, where companies cannot find university graduates or it can take more than a year. In contrast, employees with such qualifications are easiest to find in the Northern Hungary region.

The results are similar for employees with secondary vocational education. In Budapest, Western Transdanubia and Southern Transdanubia too, it is extremely difficult to find staff with such qualifications. It is also very difficult for companies to find high school graduates without a vocational qualification. There is an even lower regional concentration of unskilled labour. Here too, the Northern Hungary region is generally in a better position.

The post-pandemic recovery was accompanied by severe labour market restrictions, and the Hungarian labour market became even tighter. With the exception of the Northern Hungary region, where respondents did not experience any problems with recruiting staff, the other regions reported problems with excessive salary expectations and lack of experience. Budapest stands out for its lack of experience, while in the Central Transdanubia region the high salary expectations of unskilled labour were a problem.

In the questionnaire, we analysed 63 jobs that experts agree will be of central importance for digitally transformed companies in the next decade. Many of them are cross-industry, i.e. they can be applied to any production company. The analysis did not identify any regional differences in terms of future jobs, but rather revealed existing regional peculiarities. We only considered jobs for which at least five responses were received, i.e. we analysed 28 out of 63 jobs. The study confirmed that there is some overlap between the jobs, i.e. there are some tasks that were typically mentioned together by the respondents.

On this basis, two groups can be clearly distinguished. One group is related to the area of production management, including the tasks associated with the job of a Product Owner, as well as jobs related to human resource management. This cluster can be assigned to the service or operations departments of companies.

The other group is more closely associated with the job of a Business Analyst, which involves analysis and development activities to support the organisation in all vertical areas. It is interesting to note that marketing and other related activities (such as Content Specialist) were included in the second and not the first group. The reason for this is not clear, but this second group probably includes the digital branch of marketing, which requires digital knowledge and development skills that are not necessarily part of “traditional” marketing knowledge. These two groups give a good indication of the changes in the labour market and future trends.

The sample

Our online questionnaire, which was developed in collaboration with MGYOSZ, was available to potential respondents for longer than usual, as unfortunately very few respondents completed it within the planned two-month period. Our Client's representative therefore decided to try again after the summer holidays to persuade as many representatives of companies and institutions as possible to take 15 minutes to complete our questionnaire. In the end, 170 people had answered our questions by mid-December.

The regional distribution of our sample is shown in the figure below:

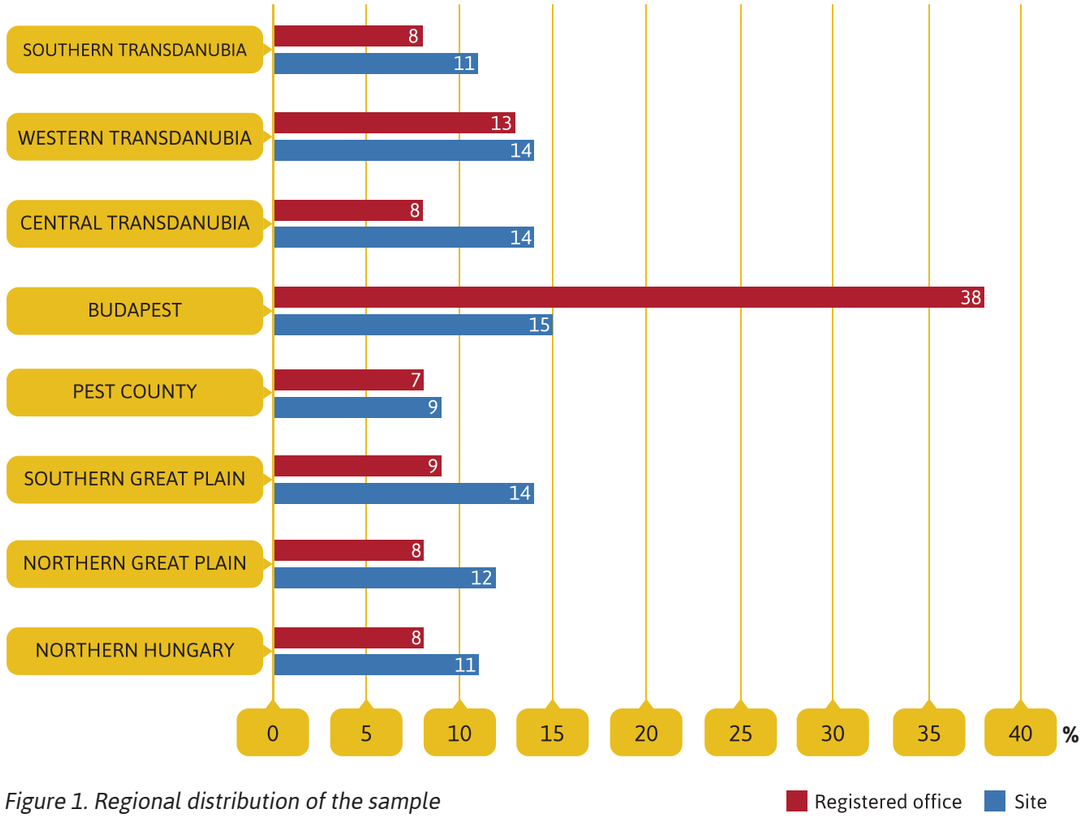


Figure 1. Regional distribution of the sample

As we can see, all regions are more or less strongly represented in our sample depending on their economic weight. The overwhelming dominance of Budapest as the location of our respondents' employer reflects the fact that it is still perceived as good to have the headquarters of a company "near the fire".

In order to understand the sectoral affiliation of the companies represented by our respondents, we asked them where their company is categorised according to the NACE classification. Representatives of companies providing administrative and service activities, i.e. companies classified in sector N, were also asked to indicate whether they provided a labour market or other service. In the following figure, sector N is not shown as a whole, but only the two sub-sectors.

Unfortunately, we did not do this for the other, very complex sector, which covers a wide range of activities; for sector M, for example, freelance, scientific and technical activities, we therefore do not know whether our 17 respondents are lawyers, accountants, tax consultants, architects, scientific researchers, advertising specialists, photographers, translators or even veterinarians.

Figure 2. Distribution of the sample by sector

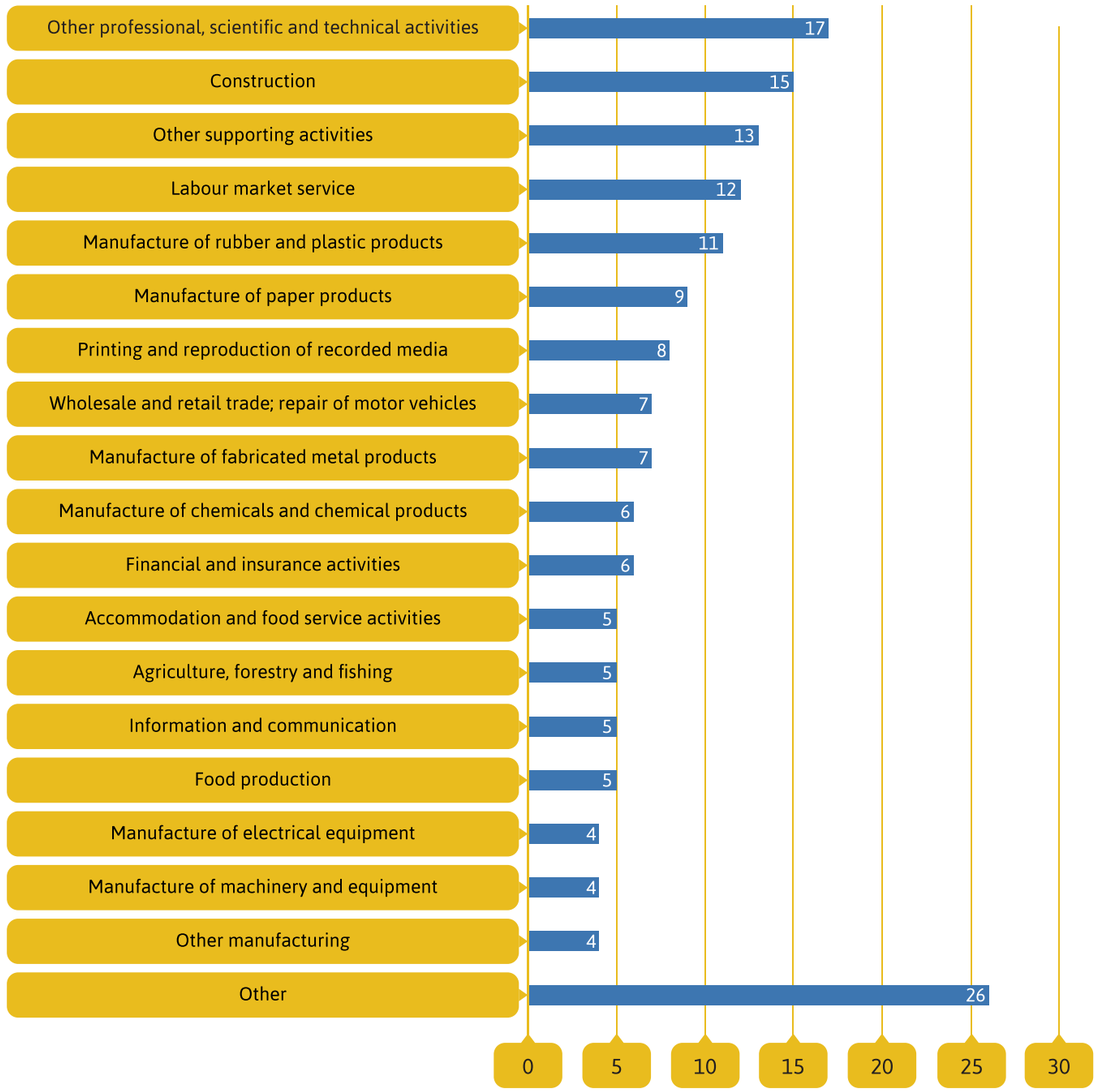
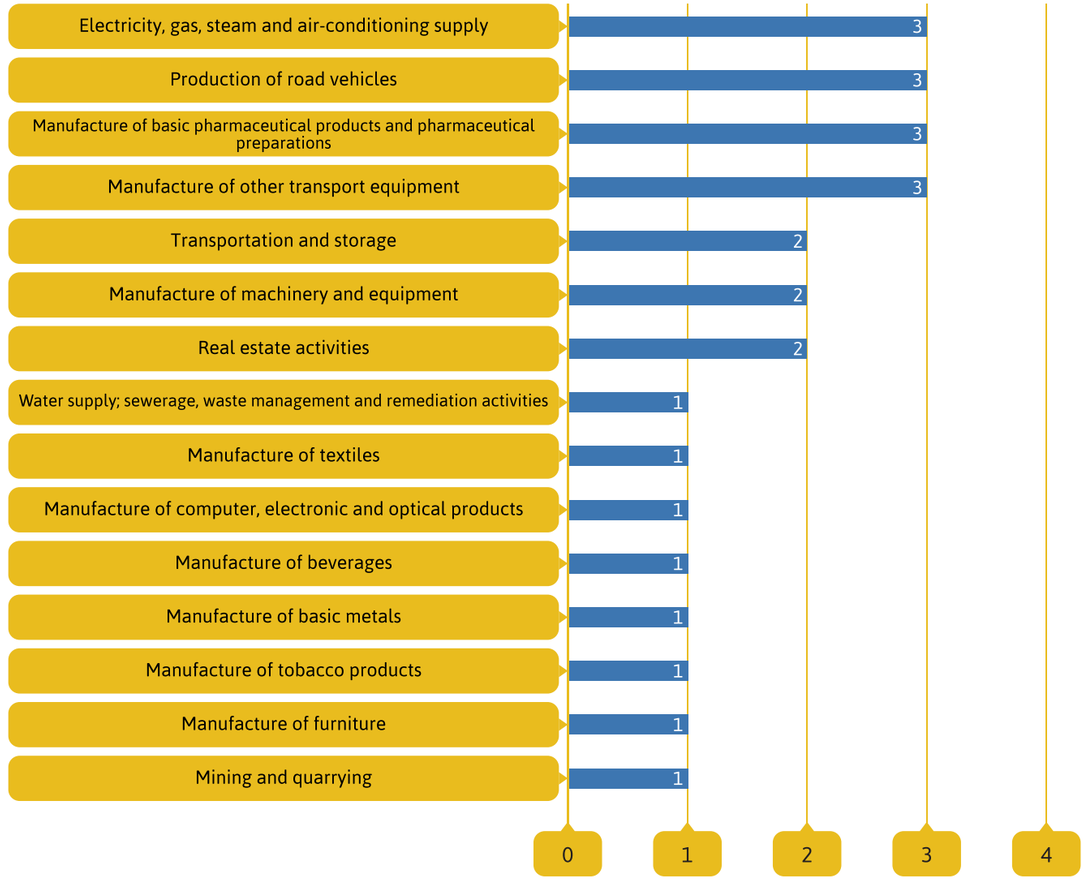


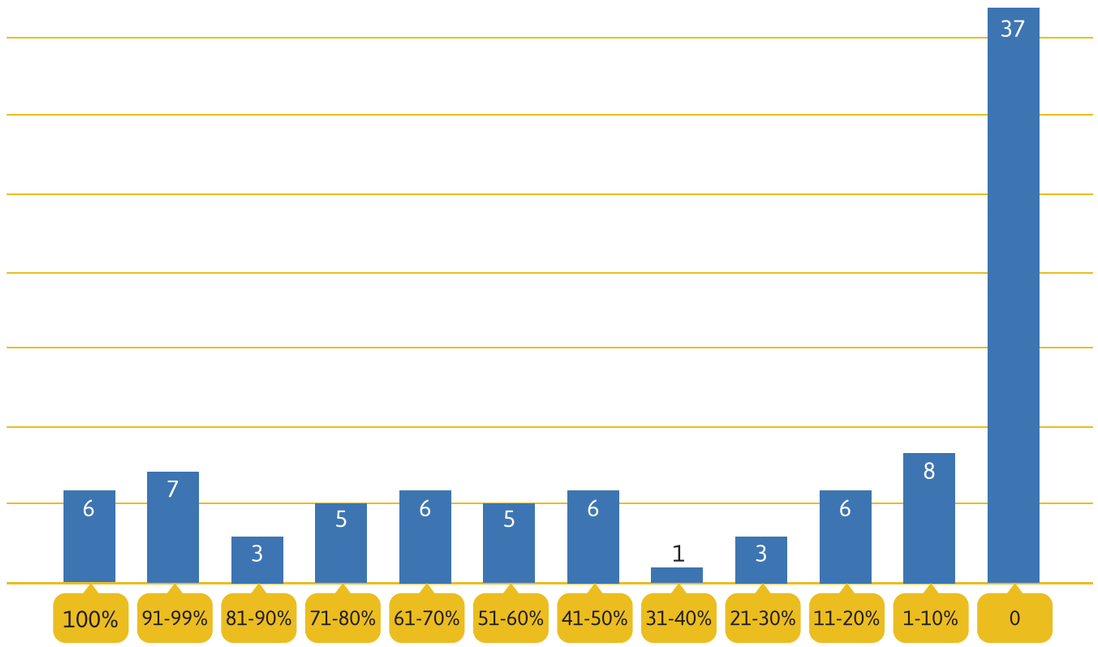
Figure 3. Distribution of the sample by "other" sectors



Only 93 people responded to our next question about the share of exports in the sales of the company's products and services. It can be concluded from this that our sample includes quite a few representatives of institutions and organisations for which exports are not relevant.

We originally wanted to know how companies' exports developed between 2019 and 2022, but since almost all respondents reported the same export share of their company's sales for each year, we only show their estimate for 2022 in the figure.

Figure 4. Share of exports in sales



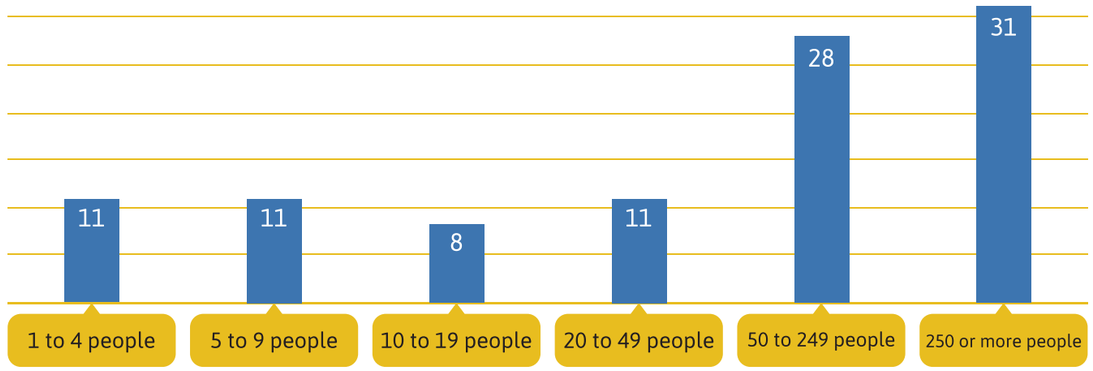
This shows that relatively few truly export-orientated companies are included in our sample. Only 21 of the companies surveyed had an export share of over 70% in 2022.

The response rate to our question about foreign ownership was also low. A total of 97 respondents gave an answer in this regard, and two thirds of them stated that they have no foreign capital in their company at all. 30 respondents represent wholly foreign-owned companies. Three respondents stated that more than 50% of the companies are foreign-owned.

Our next question related to the number of employees in the respondents' companies. It is pleasing that, in contrast to other similar surveys, we had a high number of large companies represented in our survey. 31% of our respondents work in organisations with more than 250 employees. Companies with 50 to 249 employees were also well represented in our sample.

In order to capture SMEs with fewer than 50 employees, we have divided the segment into four groups. The responses showed that micro-enterprises, i.e. companies with 1 to 4 and 5 to 9 employees and companies with 20 to 49 employees each account for 11% of our sample. Companies employing 10 to 19 people are only just behind at 8%.

Figure 5. Distribution of the sample by company size



The penultimate question in our statistics section was: “Please indicate roughly what percentage of your workforce is made up of temporary workers.” ***We had 35 respondents whose company employs temporary workers, and seven of these companies offer labour market services.*** Moreover, these companies have the highest share of temporary workers. The highest rates were found in three companies offering labour market services with more than 250 employees. Two had a 95% share of temporary workers, who have been or can be loaned out to other companies, and one had a 90% share. In addition, one company reported a temporary workers rate of 20% and the remaining three companies offering labour market services stated a share of temporary workers of 10%.

This suggests that companies that “buy” workers to perform productive work through temporary employment agencies prefer this to complying with obligations under various labour laws and perhaps also strategic contracts providing for certain subsidies. ***The employer of temporary workers is the temporary employment agency and not the company where the actual work takes place.***

Among the companies with a high share of temporary workers, there is one medium-sized company from the construction sector and, in particular, micro-enterprises from the IT and hotel and catering sectors. Most companies with a 10 to 15% share of temporary workers operate in the rubber and plastic goods and mechanical and plant engineering sectors.

Our last question concerned the nationality of the employees. More than two thirds of our respondents employ 100% Hungarian nationals. The 12 companies, where 98 to 99% of employees are Hungarian citizens, “import” the remaining 1 to 2% from neighbouring countries. It is not surprising that companies offering labour market services employ a higher proportion of foreigners. In two companies, only 50% of employees were Hungarian nationals, in three companies the figure was 65 to 80%. They also have a high share of non-European employees.

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SITUATION AND PROSPECTS OF THE COMPANIES

The aim of the first key questions in our questionnaire was to find out how respondents assess the current situation of their company and its prospects in a year's time. From the answers, one could conclude that they are satisfied with the current situation and optimistic about the future, as almost a third of them consider the current situation and almost as many of them the prospects to be good. However, it should not be forgotten that only 105 respondents answered these questions, and presumably those who did not wish to answer are less satisfied.

Most companies that are both satisfied now and optimistic about the future are active in the labour market services sector, followed by manufacturers of rubber and plastic goods, paper products and food. ***The most pessimistic respondents represent the construction industry, the scientific and technical professions and the printing and reproduction industry.***

The respondents' perception of the current situation fundamentally shaped their vision of the future. Only three respondents were confident that their company's current poor situation would improve. Likewise, three respondents expect the current poor situation to worsen.

Contrary to our expectations, ***respondents in Northern Hungary were the most satisfied***. There was only one of them who described the current situation in their company as bad but, like all their colleagues, hopes that next year will be better.

Almost all export-oriented companies, i.e. those that achieve more than 90% of their sales from exports, rated the past year as average, and only two of them were optimistic about the coming year. The latter were tho ones who described the past year as a bad year.

As far as the number of employees is concerned, companies with more than 250 employees are predominantly pessimistic, while the optimists in our sample represent mostly SMEs and, among them, primarily micro-enterprises. Of course, we should not draw any far-reaching conclusions from this, because the CEOs of SMEs that are struggling to survive have other problems than filling in our questionnaire.

How do you assess the current situation of your company overall?

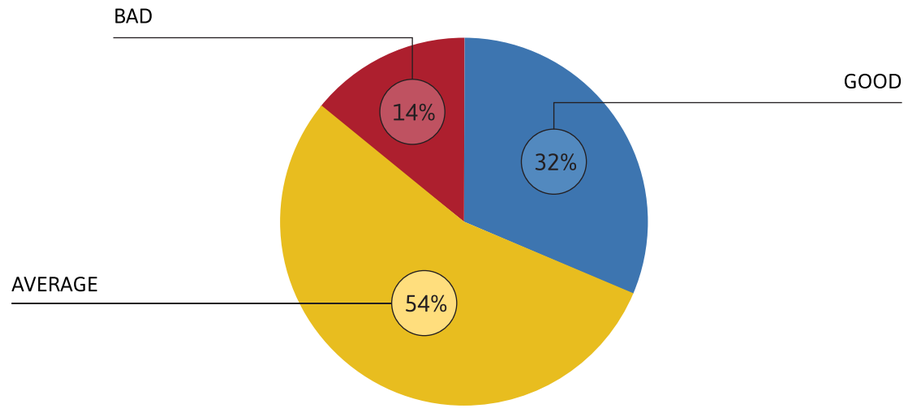


Figure 6. Assessment of the current situation

What situation do you think your company will be in a year from now?

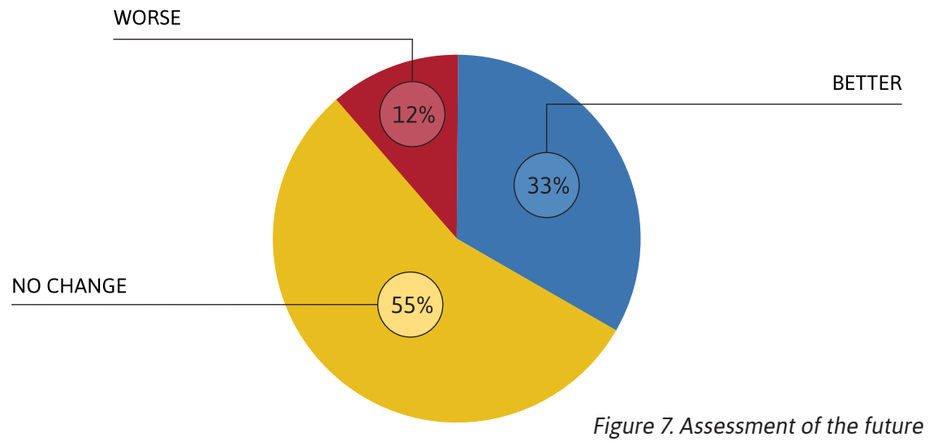


Figure 7. Assessment of the future situation

LABOUR MARKET BEFORE AND AFTER THE PANDEMIC

By way of introduction, we tried to give an impression of the labour market situation by asking a series of questions about the recruitment of employees. We wanted to find out how long it took companies to find new employees with different skills, first in relation to the time before the pandemic and then to the current situation.

From the figures based on the responses, it is immediately apparent that the share of the option "We found employees within a short time" has fallen very sharply for all levels of education. While before the pandemic, more than a quarter of respondents said they had found a new unskilled job almost immediately, only 11% are now in such a favourable situation. For jobs requiring a secondary vocational qualification, the 10% rate has halved, while the 20% rate for jobs requiring a vocational qualification based on a school-leaving certificate but not a university/college degree has fallen to 7% and the 15% rate for jobs requiring a university/college degree has fallen to 3%. There is also a significant increase in the response option "It took us 10 to 12 months to find employees", but the biggest problems are caused by the frequency of the option "We were not able to find suitable employees", which is shown in green in the figure. While only a small share of respondents stated that they were unable to find suitable staff before the pandemic, this now applies to an increasing number of respondents. It is particularly worrying that 8% hold this view for jobs that require a secondary school qualification.

Looking at the problem in a regional context, we see that most of our respondents who were unable to find new employees with a secondary school qualification or without a qualification, or who only found them after a year or so of searching, represent companies in the Western Transdanubia region. (This is most likely due to the pull effect of the national border.) However, the most frequent complaints about the lack of university/college graduates came from companies in the Northern Great Plain and in Budapest.

The respondents who were unable to find new employees or only found them after a long search mainly represented the rubber, printing and construction industries.

How long did it take to find new labour before the pandemic? (%)

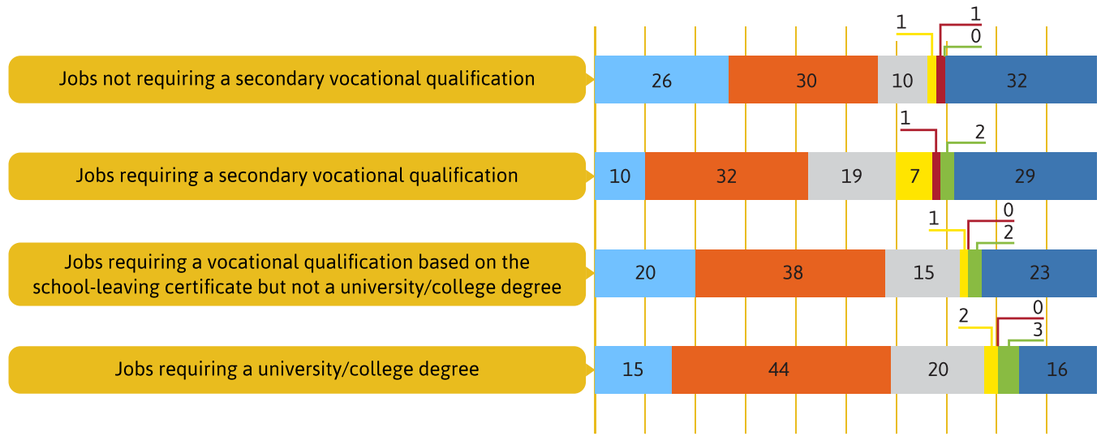
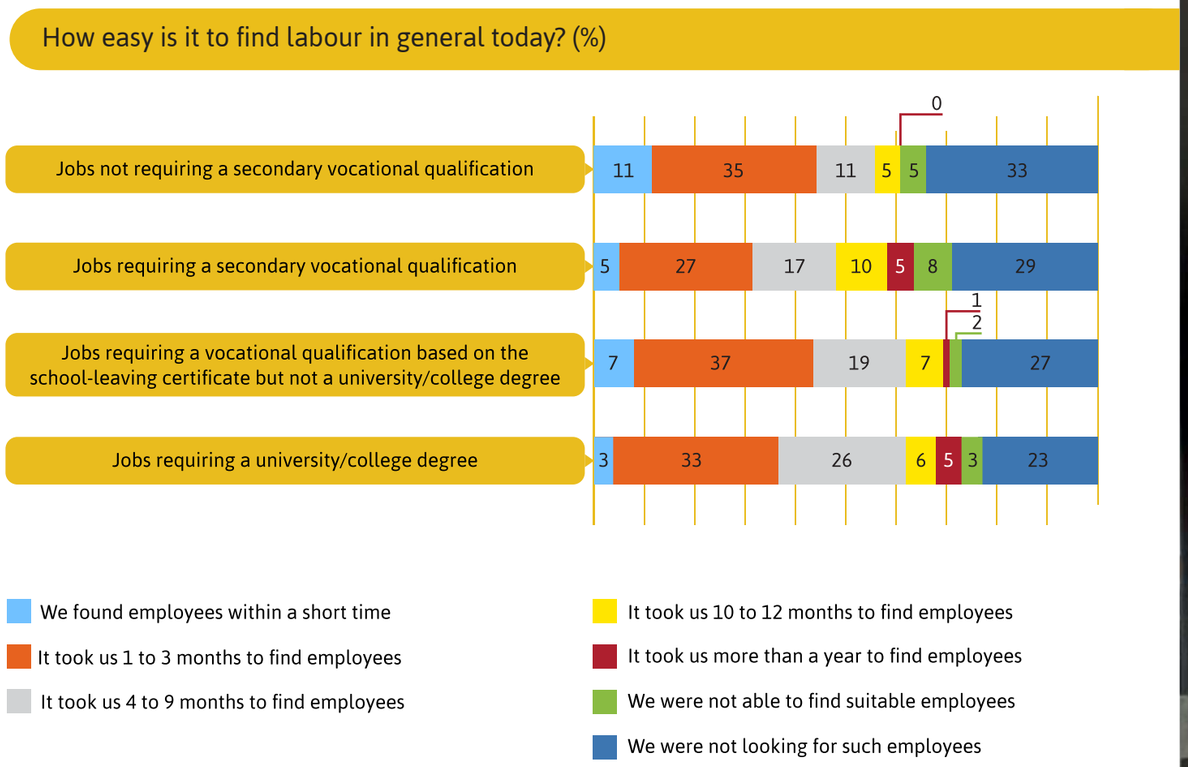


Figure 8. Recruitment difficulties before the pandemic

Figure 9. Recruitment difficulties today



Our next question centred on the challenges companies faced in hiring employees before the COVID-19 pandemic and how these challenges have evolved today. We provided four possible answers and also allowed respondents to express their own concerns and views in an open-ended question.

The figures below, which summarise the responses, show how much the share of respondents who selected the "We have/had no problems" option decreased and how much the share of those who chose "There are applicants, but with high salary expectations" increased in each of the four qualification categories over the two periods studied.

According to our respondents, ***more than half (51%) of applicants for jobs requiring a university/college degree are now demanding higher salaries than companies can afford***, compared to "only" 36% before the COVID-19 pandemic.

The statement "There are/were applicants, but with insufficient qualifications/experience" is now a problem for more companies in the lower two categories of educational level than before COVID-19, but it is less of a problem for high school graduates and university/college graduates than before, although still significant.

Figure 10. Recruitment difficulties before the pandemic by type of difficulty

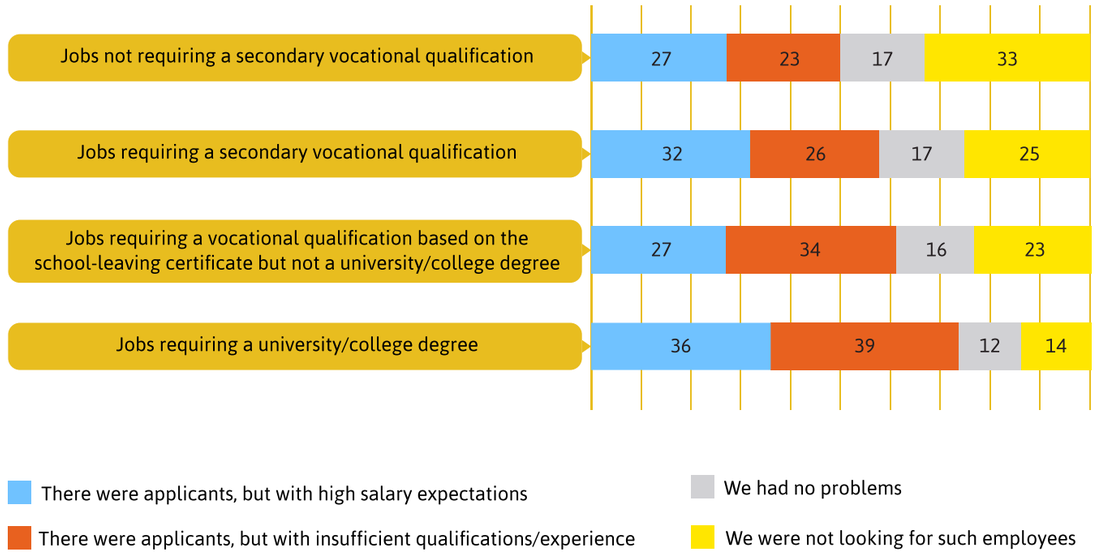
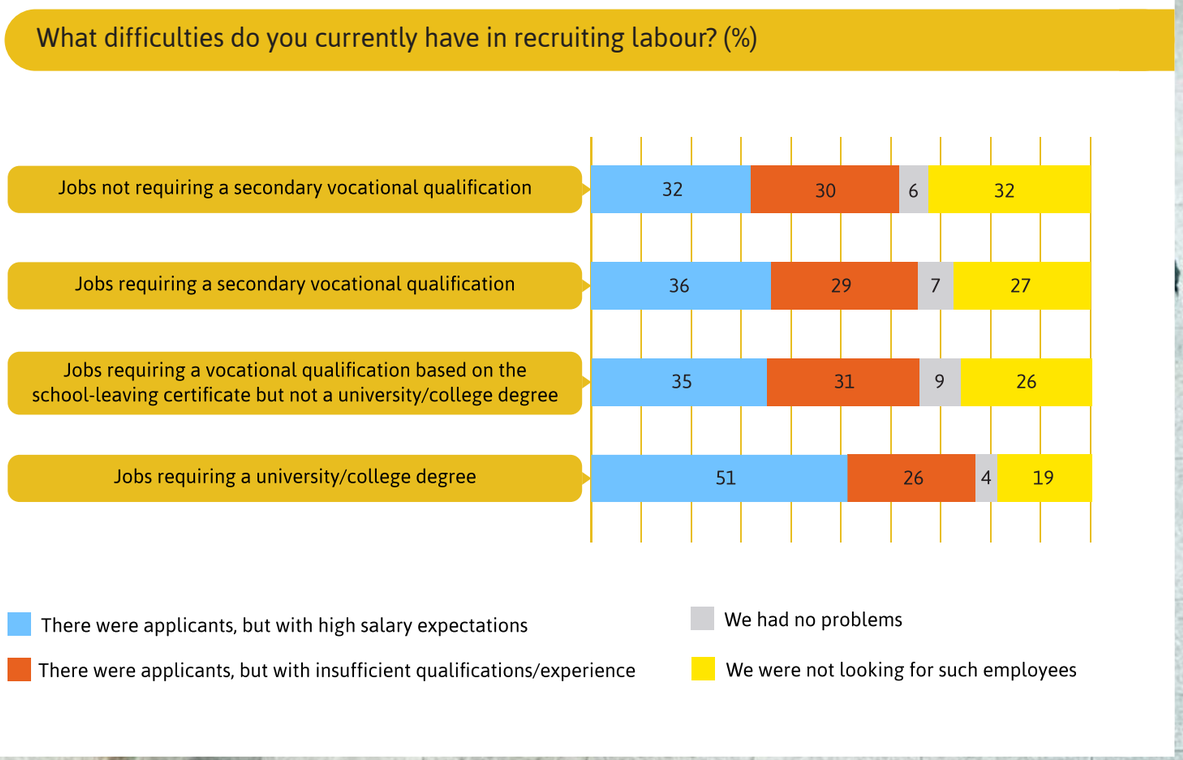


Figure 11. Recruitment difficulties today by type of difficulty



The most interesting results, as expressed by the company representatives in their own words, are shared below:

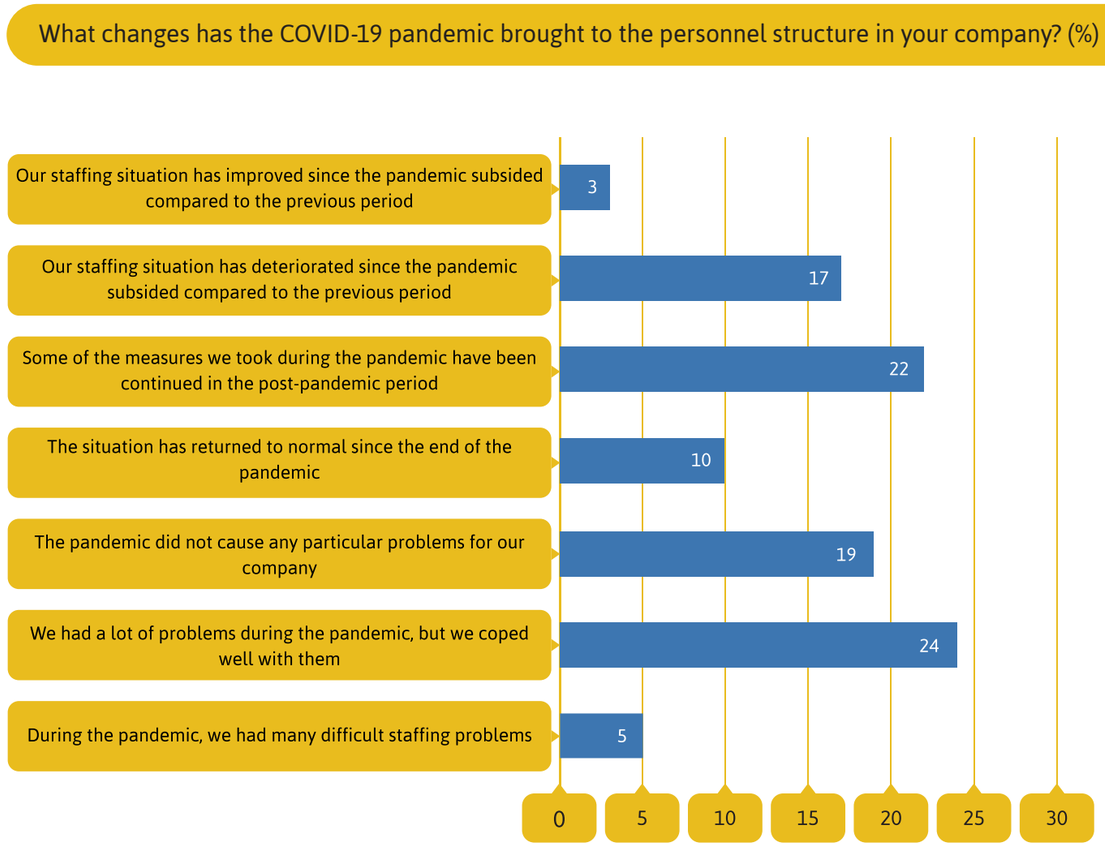
- A representative of a large pharmaceutical company said: “In areas requiring specialised knowledge, it is more difficult and takes longer to find suitable employees.”
- One respondent, who completed our questionnaire on behalf of a mechanical and plant engineering company in the Southern Great Plain, said: “It’s getting harder and harder to find colleagues, Budapest and the large investments are drawing people away. Many are prepared to travel 100 to 150 kilometres a day to work for more money.”
- “The current situation and the business environment are desperately bleak”, said the managing director of a small ICT company in Budapest.
- A representative of a large company manufacturing machinery and mechanical equipment in the Central Transdanubia region sees the problems as follows: “High salary expectations, withdrawal from tenders, difficulties travelling to work, hybrid work.”
- A representative of a mid-sized company providing services in Western Transdanubia wrote that “we can’t find people for jobs that don’t require qualifications”.
- According to a large company in the metal industry in the Southern Great Plain, the problem is that there is “too much staff turnover”.
- A representative of a large construction company in Northern Hungary said that “the situation is unchanged”.

We then asked what changes the COVID-19 pandemic has brought about in the company’s personnel structure. In this case, respondents were allowed to tick more than one of the options we provided.

Most respondents, almost a quarter (24%), stated that they had many problems during the pandemic but had coped well with them. A large number (22%) also stated that they had carried over some of the measures taken during the pandemic into the post-pandemic period. For 19% of companies, the pandemic was not a major problem, with 3% saying that the labour supply situation in their company improved after the pandemic subsided.

However, 17% of them stated that their labour supply deteriorated after the pandemic subsided. The number of people whose companies returned to normal after the pandemic subsided was 10%.

Figure 12. Changes in the labour market as a result of the pandemic



MEASURES IN RESPONSE TO COVID-19

At the end of the section on the impact of the COVID-19 pandemic, we asked respondents to describe in their own words what labour measures they took during the pandemic and which of these measures they maintained after the end of the pandemic.

As is usually the case with surveys, only a few people took the trouble to write text responses. Most of them simply skipped this question or entered one or two words. Most of these laconic responses mentioned the introduction of the home office, the obligation to wear masks and the tightening of hygiene regulations. With regard to the home office, many noted that it has been maintained under limited conditions for certain jobs.

Below we quote verbatim some of the responses that report in more detail on the measures taken in the companies.

A representative of a mechanical and plant engineering company in the Northern Great Plain with more than 250 employees commented as follows:

"With regard to the pandemic:

- tests
- use of masks
- keep distance
- the possibility of home office

Regarding the labour market:

- utilisation of a large number of temporary workers to eliminate fluctuations in personnel and orders
- restructuring measures were implemented to ensure the smooth fulfilment of tasks

We have retained the use of masks for people with upper respiratory tract diseases. We will continue to keep the number of temporary employees flexible."

A representative of a large company in Budapest, active in the electricity, gas, steam and air conditioning sector replied: *"The entire administrative staff worked from home during the pandemic. Hybrid forms of work (home/office work) were already common before the pandemic and have been maintained. During the pandemic, there were strict admission controls for physical staff, which are no longer applied after the pandemic has subsided."*

A small company with scientific and technical activities in the Southern Great Plain has opted for *"home office, online management systems and the introduction of new IT applications".*
A representative of a large pharmaceutical company in Budapest wrote that *"we'll maintain the following measures even after the pandemic subsides: the possibility of home office, holding meetings online, increased hygiene in work areas."*

ASSESSMENT OF THE WORKFORCE

In this section, we asked respondents to rate the domestic supply of skilled and unskilled labour based on several criteria. For each of these aspects, we first asked them to assess the trends in 2010 and then the situation they expect for the next ten years.

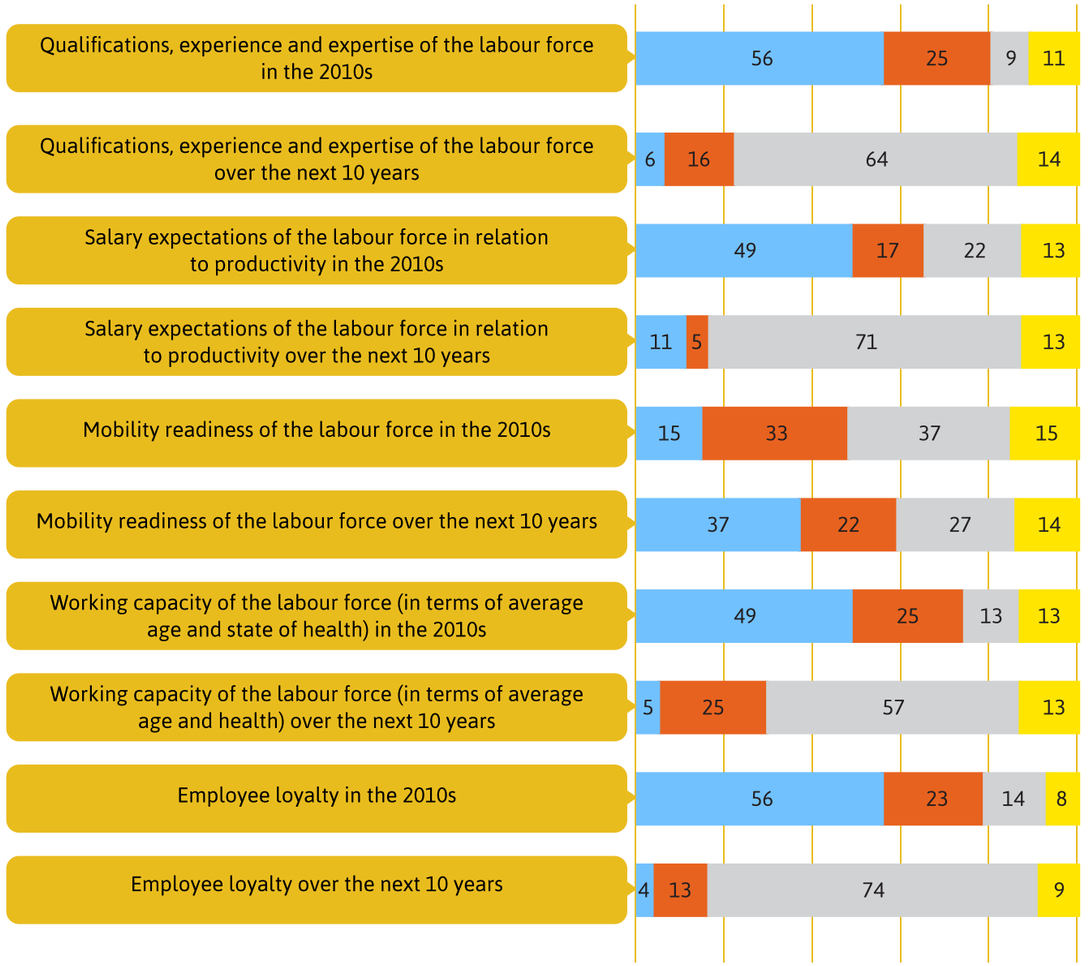
One look at the figures is enough to realise what a gloomy vision of the future our survey participants have.

There is only one area where they expect an improvement in terms of their expectations of a *qualified* labour force. This is the mobility readiness of the workforce, which 37% of our respondents believe will be better in their company in the next ten years than it is today. In the other areas, only a small share of them expects a certain improvement. Compared to the current situation, only 6% of our respondents expect an improvement in the skills, experience and expertise of the workforce, only 5% expect an increase in the ability to work (given the average age and health) and 4% expect a strengthening of loyalty.

The share of those who expect the current situation to deteriorate is shown in grey in the figures and has reached an alarming level. 74% of respondents believe that the loyalty of employees in their companies will deteriorate, 71% believe that employees' salary expectations will worsen in relation to their productivity, and 64% believe that employees' skills, experience and expertise will fall below current levels.

Figure 13. Assessment of qualified labour

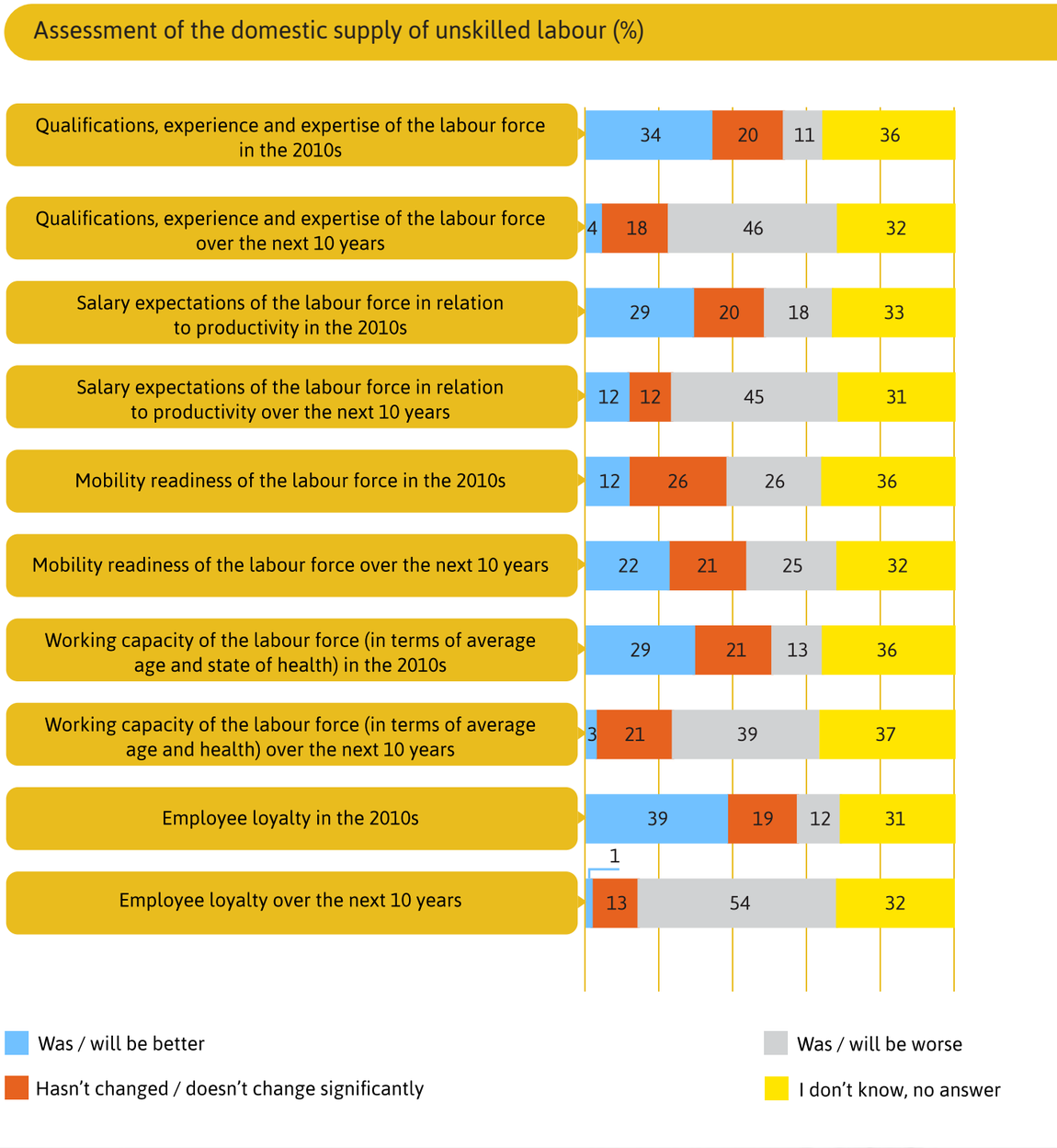
A hazai szakképzett munkaerőpiaci kínálat értékelése (%)



Similar expectations are found for *non-skilled* jobs, with the difference that the proportion of "I don't know, no answer" options was very high. Almost a third of respondents believe that the situation is so uncertain that they are unable to take a position.

This segment also has the most positive expectations in terms of mobility readiness, and the greatest concerns here too relate to loyalty, expertise and salary expectations.

Figure 14. Assessment of unskilled labour



Jobs of the future

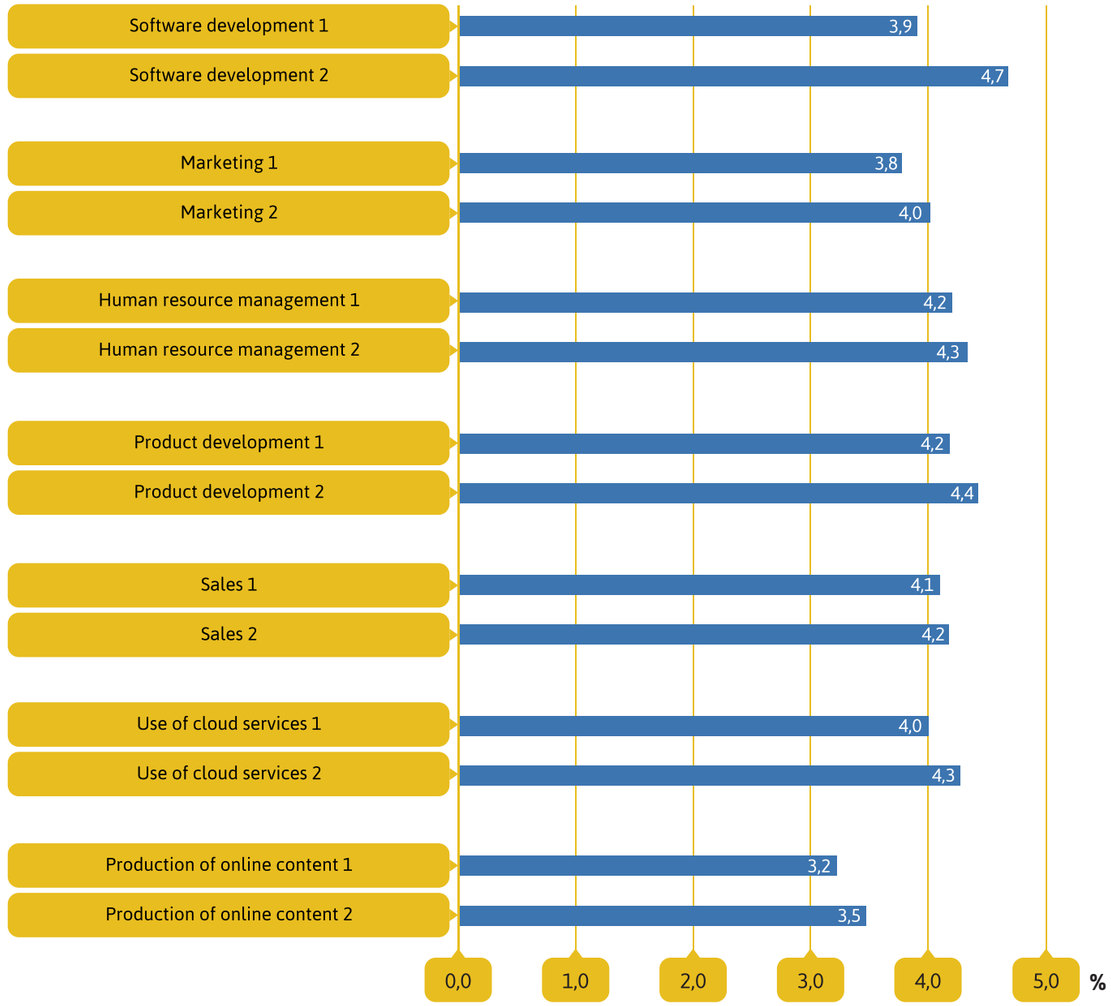
A LITTLE JOURNEY THROUGH TIME

According to analyses, more than half of today's professions and jobs did not exist half a century ago. In addition, around 40% of the jobs carried out 50 years ago no longer exist today. To introduce the section on jobs of the future, we asked respondents to travel back in time. We wanted to know how important they think some of the activities we consider important will be for their company and the local economy in ten years' time. We asked the respondents to rate the areas of activity we mentioned with school grades. (1 means not important at all and 5 means extremely important.)

Before looking at the "report card" in more detail, let's see how the "class average" has changed!

Figure 15. Assessment of jobs that are important for the company and the economy

Importance of activities in 10 years for the own company (1) and for the Hungarian economy (2) (average of the grades received)

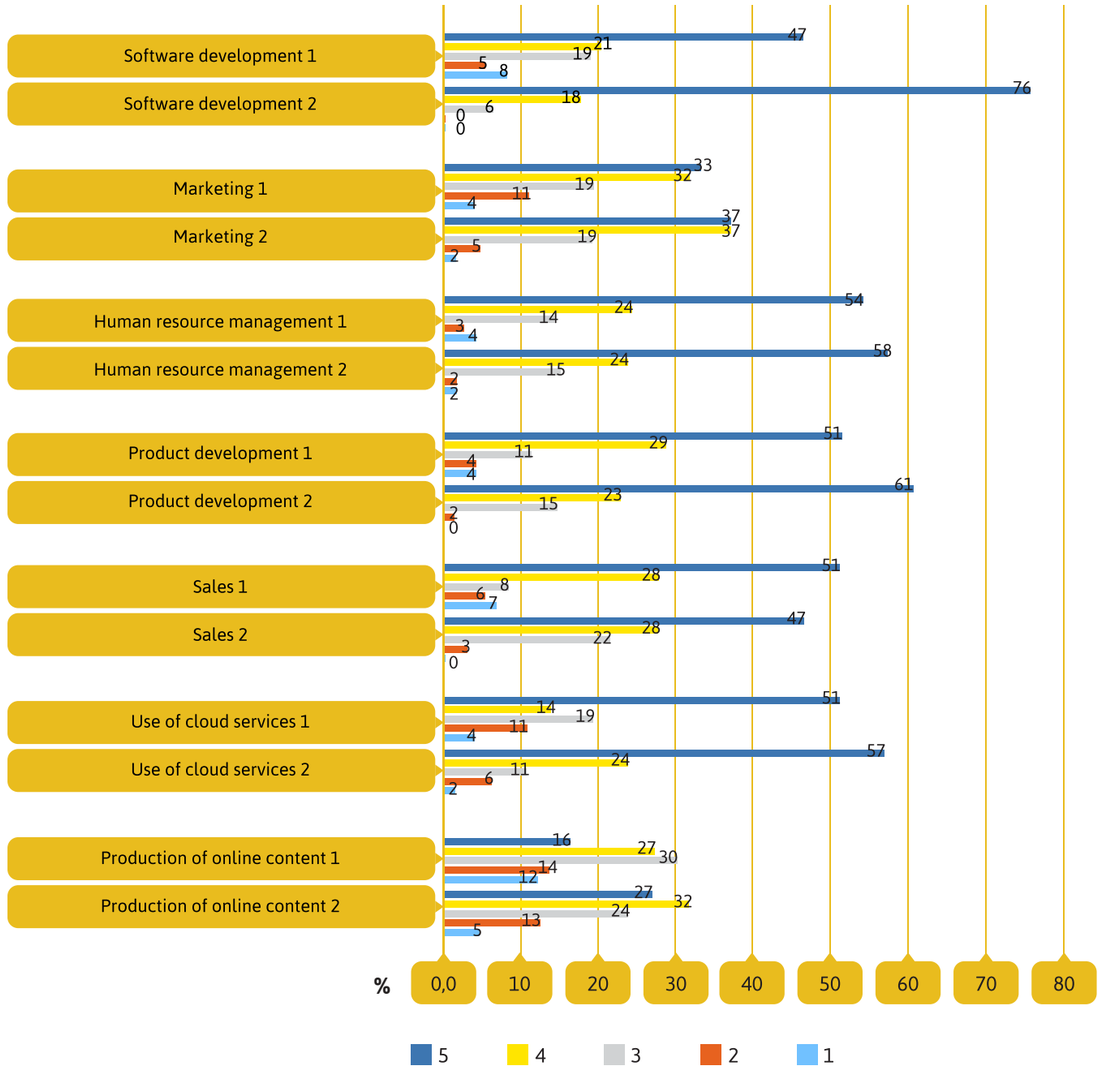


The first thing that stands out in the figure is that ***all activities are considered more important for the national economy than for the company itself.*** It is important, but it is better if others deal with it more intensively... The expected significance for the respondents' own company and the Hungarian economy shows the greatest difference in *software development*. While this achieved the highest average score (4.7) of all activities, it had one of the worst average scores (3.9) for the own company. There were two activities with a difference of 3 tenths of a point. The average use of *cloud services* was 4.0 at company level and 4.3 at national economy level, and for the least important area, the *production of online content*, the two values were 3.2 and 3.5 respectively.

In terms of importance for the respondents' own company, *HR management and product development* received the highest average scores of 4.2. *Sales* and the *use of cloud services* were not far behind (4.1 and 4.0 respectively).

Figure 16. Assessment of jobs that will be important for the company and the economy over the next ten years

Importance of activities in 10 years for the own company (1) and for the Hungarian economy (2) (Percentage distribution of the grades received)



The distribution of the highest grade (5) also reflects the phenomenon that can be observed in the average scores. Many more respondents gave economic importance the highest grade. Only in sales did the companies receive more fives.

The expected importance of software development for the economy received by far the most top grades. Over three quarters of respondents (76%) believe that this activity will be very important in the future. Not so much in their own company, of course... In this respect, the share of the top grades was only 47%. The proportion of top grades was also remarkable in the areas of product development (61 and 51%), HR management (58 and 54%) and cloud services (57 and 51%).

Interestingly, the importance of marketing for both the company and the Hungarian economy received almost as many good as bad grades. Both aspects each accounted for a quarter of the responses.

The production of online content received the lowest grade. Here, the grade "average" was at 30%, "good" at 27% and "excellent" at only 16% in relation to the respondents' own company. The same figures for the national economy were 24, 32 and 27%. It was also this job that most respondents rated as unsatisfactory. 12% of our respondents believe that this is not necessary for their company and 5% consider the necessity at national level to be important.

At company level, the number of worst grades is also high in the areas of software development (8%) and sales (7%).

For the jobs of the future, we also gave respondents the opportunity to say in their own words ***what they think could be important in the next decade,*** apart from the areas we have listed.

Most respondents cited the rise of artificial intelligence (AI) and the rapid utilisation of its potential applications, both in general and in their own fields. Big data, the data economy, robotics and automation were also mentioned in various contexts.

The importance of utilising the potential of innovation and digitalisation, particularly in companies in project management-intensive sectors, was also mentioned several times.

The importance of environmental protection and waste management/recycling was also emphasised by several respondents.

They also drew attention to the changes in recruitment channels, the importance of appropriate regulation for the recruitment of foreign labour, the management of knowledge transfer and the development of dual VET and adult education systems.

As the final question in this section, we asked respondents to list up to five skills that they believe will be most needed in their workplace in the future. Their answers are summarised in the table below.

Sector	Required qualifications in a ten-year perspective
Labour market services	Payroll administrator, salesperson, recruiter, graduates in economics, law or HR, IT and software developer, skilled metal and chemical workers, management trainer, electrical engineer
Other supporting activities	HR specialist, IT specialist, continuous training, language skills, accountant, asset valuator, economics graduate, IT specialist, knowledge of economics, law and taxes
Other manufacturing	IT specialist, electrical engineer, technician, tailor, seamstress, electrician, accountant, payroll administrator
Manufacture of other transport equipment	Welder, toolmaker, machinist, industrial mechanic, machine setter
Food production	Machine operator, electrician, mechatronics engineer, technical engineer, economist, web developer, business IT specialist, controller, project manager
Construction	Digitisation and automation specialist, electrician, programmer, forklift driver, engineer, equipment manufacturer, fitter, welder, industrial mechanic, engineer
Manufacture of fabricated metal products	Turner, welder, logistics administrator, NPI engineer, lean engineer, QA, HR, production manager

Sector	Required qualifications in a ten-year perspective
Manufacture of machinery and equipment	CNC setter, robotics technician, metallurgist, AI expert, controller, data analyst, design engineer, test engineer, edge bender, welder, forklift driver, electronics technician, machinist, CNC machinist, electrician
Manufacture of rubber and plastic products	Industrial automation technician, mechanical engineer, electrical engineer, materials engineer, commercial marketing Bsc, printing machine operator, machine operator, sales manager, purchaser, maintenance mechanic for electrical machines, maintenance mechanic for mechanical machines, machine setter, salesperson, business developer
Manufacture of basic pharmaceutical products and pharmaceutical preparations	Development pharmacist, analytical laboratory manager, innovation developer, drug registrar, automated warehouse manager, manager
Information and communication	Energy consultant, software developer, software designer, UX designer, software tester, marketing professional, IT specialist, engineer
Printing and reproduction of recorded media	CTP operator, machine operator, cutter, bindery machine operator, salesperson, flexographic printing plate mounter, plate manufacturer, graphic preparation operator, production preparer, customer order manager, printing press operator, electrician, machine mechanic, foreign language correspondent
Manufacture of paper products	Printing machine operator, maintenance engineer, cleaning staff, HR, IT

Sector	Required qualifications in a ten-year perspective
Financial and insurance activities	BI specialist, auditor, IFRS accountant, controller, financial specialist, financial controller, IT network operator, telephone operator, light work (ticket seller, etc.)
Other professional, scientific and technical activities	IT developer, online content developer, economist, lawyer, project manager, business administrator, investment mechanical engineer, urban planner, marketing specialist, humanities graduate, technical university graduate, economics, IT specialist with project management skills, event organiser, chemical engineer, textile engineer, quality assurance engineer, controller, textile technician, quality assurance engineer
Accommodation and food service activities	Cook, waiter, salesperson, driver, accountant
Transportation and storage	Warehouseman, forklift driver, customer contact person
Manufacture of chemicals and chemical products	Chemical engineer, chemical technician, electrical engineer with IT knowledge, development engineer, project manager, salesperson, operations manager, IT administrator
Manufacture of electrical equipment	Development engineer, technologist, designer, foreign trade clerk, economist, electrical engineer, mechatronics engineer, electrical technician, IT specialist

JOBS IN THE DIGITAL TRANSFORMATION

The last part of our questionnaire was designed to get respondents to take a look into the future. We have listed sixty jobs which, according to international experts, are needed by companies for the digital transformation now or - which is more likely to be the case in Hungary - in the near future. We asked them to identify five of these jobs that they believe will be most important for their company's digital transformation in the coming decade.

Unfortunately, this request was not honoured by everyone. There were respondents who selected only one or two jobs, and unfortunately there were also quite a few who did not answer this question. Admittedly, those who fill out relatively long questionnaires lose patience in the end and answer the last questions only roughly or even skip them, but many probably also thought that the jobs listed would not be needed in their company in the foreseeable future. Nevertheless, an interesting picture has emerged.

If you click on the small link next to the job description, you can find out more.

In the table analysing the responses, we have included a link to each job title to give you access to the definitions.

As can be seen from the table below, of the 60 jobs listed in our questionnaire, only 9 were mentioned by more than 10 respondents as an important activity for their company in the future. Our list is topped by two very similar jobs, *Data Analyst* and *Business Intelligence Developer*, with 17 points each. This, and the fact that a number of data science-related activities can be found in the top half of the midfield, indicates that respondents recognise and value the role this discipline has already played and will increasingly play in the future. Unfortunately, this process in our country is nowhere near as advanced as it should be, so the mere fact that the need for this job has been recognised by the respondents is very welcome.

The *Cloud Engineer*, which came third with 16 points, probably scored so well because the migration of company data and systems from physical storage to the cloud is already on the agenda in many places and this process can only be managed with the help of very well-trained specialists.

The other important group in the top field includes jobs in *business development*, *production process optimisation* and *sales*, all of which use the achievements of digitalisation for rationalisation.

Over the last 10 years, a wide range of activities and a very broad spectrum of related jobs have emerged on the various internet platforms. As we have included a whole range of these jobs in our finely tuned list, almost all of them are ranked in the midfield. This is mainly due to the fact that these functions are still seen as interchangeable in Hungary.

Number of mentions	Job title
17	Data Analyst
17	Business Intelligence Developer
16	Cloud Engineer
14	Head Of Business Development
13	DevOps Engineer
13	Sales Development Representative
12	Social Media Coordinator
12	Data Engineer
11	Artificial Intelligence Specialist
8	Platform Engineer
8	DevOps Manager
8	Content Specialist
8	Human Resources Business Partner
7	Social Media Assistant
7	Data Scientist
7	Analytics Specialist
7	Digital Marketing Specialist
7	Digital Marketing Manager

Number of mentions	Job title
7	Human Resources Partner
7	Talent Acquisition Specialist
7	Partnerships Specialist
7	Business Development Specialist
6	Site Reliability Engineer
6	Content Writer
6	Big Data Developer
6	Product Owner
6	Chief Strategy Officer
5	Agile Coach
5	Product Analyst
4	Cloud Consultant
4	Development Specialist
4	Business Development Representative
4	Customer Support Specialist
3	Content Producer
3	Technology Analyst
3	Ecommerce Specialist

Number of mentions	Job title
2	Analytics Consultant
2	Javascript Developer
2	Back End Developer
2	Frontend Engineer
2	Commerce Manager
2	Quality Assurance Tester
2	Scrum Master
2	Digital Product Manager
2	Customer Success Specialist
2	Chief Commercial Officer
2	Enterprise Account Executive
1	Creative Copywriter
1	Insights Analyst
1	Python Developer
1	Growth Manager
1	Digital Specialist
1	Digital Marketing Consultant
1	Software Quality Assurance Engineer

Number of mentions	Job title
1	Delivery Lead
1	Commercial Sales Representative
0	Full Stack Engineer
0	Software Developer Dotnet
0	Growth Hacker
0	Information Technology Recruiter
0	Quality Assurance Engineer

Finally, we also gave respondents the opportunity to use the field provided to enter any other jobs they consider important in addition to those listed. Alongside some responses that described our findings in other words, one respondent whose company is involved in the repair and commissioning of industrial machinery, plant and equipment wrote in a sober but apt manner: *"We need workers in several areas who can read and write, interpret written instructions, and understand basic mathematical operations."*

This is the real challenge, even if it is painful. Training professionals to meet the challenges of the digital age must start in the classroom by supporting a school system that provides for a high level of teaching in STEM subjects at all levels and the use of digital tools and applications beyond their entertainment function. On the other hand, the acquisition of skills that are necessary for digitalisation and, above all, for the new jobs that will arise with the advent of artificial intelligence, must become much more important than it is today in the dual training, retraining and further training of professionals.

Structural analysis of the survey

In this section, we analyse the structure that can be identified behind the respondents' answers. Analyses of this kind can provide an answer to the similarities or differences between the categories. If there are structural differences between the regions for a particular question, this can be reflected in the methodology used. The multiple correspondence analysis (MCA) projects categorical variables onto a lower dimension in order to obtain as much information as possible during compression. The advantage of this method is that the data can be visualised on a lower dimension, allowing the structure to be explored and interpreted. Categories that are "closer" to each other in the lower dimensional space are considered similar. At the same time, the regions can be visualised spatially; the same applies to the distance between them as for the categories mentioned above. If a region and a category are "close" to each other, a statistically significant correlation can be measured, i.e. the region tends to be characterised by nearby categories.

In the analysis, we examine the questions related to labour market supply, focusing on regional differences, but we also include the size of the respondent's company as an additional variable. Due to the relatively low frequency of the sub-sample, we are unfortunately unable to analyse the sectoral affiliation in this section.

RECRUITING STAFF BEFORE THE COVID-19 PANDEMIC

In this section, we wanted to know what experiences respondents had in the years before 2020 when they wanted to hire new employees to expand their production. The results show that there were no significant differences between the companies at regional level; they found it equally difficult or easy to find employees, regardless of the region in which they are based. Similar patterns were found for companies by size, with only large companies (with more than 250 employees) differing somewhat from the other companies surveyed, mainly because they have a much higher staff turnover than smaller companies, i.e. they hire many people with different skills at the same time, which is more challenging than a smaller increase in the number of employees in an SME or even a micro-enterprise.

As far as qualifications are concerned, companies do not differ significantly in how long it used to take them to find employees with certain qualifications.

The survey confirmed that there is no difference in the labour supply by qualification level. In general, if there are recruitment problems at one qualification level, these are usually also reflected at other qualification levels. Moreover, if the salary expectations are high, this goes hand in hand with a lack of experience. This is not surprising, as the salary expectations would not be considered high with the relevant experience. Regional differences were identified in the problems that companies had to contend with the most. In Budapest and Central Transdanubia, companies were more concerned about the salary expectations of university graduates, while in Western Transdanubia and Northern Hungary this applied more to high school graduates. Companies in Pest County were most likely to complain about the lack of experience and less about salary expectations, which is reflected in almost all skill segments.

RECRUITING STAFF AFTER THE COVID-19 PANDEMIC

After the pandemic, the picture of the labour market changed somewhat for the companies surveyed, especially when looking at the regional breakdown. The situation is similar in Western Transdanubia, Budapest and Southern Transdanubia as well as in the Northern Great Plain. Respondents in these regions stated that it takes them 10 to 12 months or even more than a year to find a graduate. In contrast, employees with such qualifications are easiest to find in the Northern Hungary region.

The results are similar for employees with secondary vocational education. In Budapest, Western Transdanubia and Southern Transdanubia, it is extremely difficult to find staff with such qualifications. The difference compared to the past is that the situation in the Northern Hungary region is not as favourable as in the case of employees with a university degree. At the same time, the job search lasting over a year is not region-specific, but rather an individual case and by no means a structural problem.

It is also very difficult for companies to find high school graduates without a vocational qualification. There are no regional peculiarities if the search takes longer than a year: While it is typically easier to find colleagues with such qualifications in Northern Hungary, as is the case with university graduates, it is extremely difficult in Budapest, Western and Southern Transdanubia.

There is an even lower regional concentration of unskilled labour. Here too, the Northern Hungary region is generally in a better position. In general, it is not common for companies to search for more than a year, as they prefer to wait just a few months before finding employees without a vocational qualification. The aforementioned regions of Transdanubia and Budapest are also in a less favourable position in this respect, but there are no strong regional peculiarities.

RECRUITMENT DIFFICULTIES IN THE YEARS AFTER COVID-19

The post-pandemic economic recovery was again accompanied by severe restrictions on the labour market. While some companies reacted by laying off employees during the pandemic, the freed-up labour was quickly absorbed by the market. In the years since then, the Hungarian labour market has become even tighter, if possible, making it even more difficult to find suitable staff. In this respect, there are generally no regional differences between the respondents. Only the Northern Hungary region stands out somewhat more clearly from the others, with respondents from this region tending to say that they have no problems hiring employees with different skills.

In contrast, other regions are struggling with both excessive salary expectations and a lack of experience. Of these, Budapest stands out, where the lack of experience is a particular problem, perhaps even more so than the high salary expectations. In the Central Transdanubia region, the lack of experience is also the main problem, as are the high salary expectations of labour without vocational qualifications. The other regions have similar characteristics, although the specifications are more blurred than in the case of Budapest.

Jobs of the future

In our questionnaire, we listed a total of 63 jobs that are generally considered to be of central importance for increasingly digitalised companies in the next decade. Of course, jobs can vary from sector to sector, and there are also sector-specific professions. The questionnaire examined jobs that are typically cross-sectoral, i.e. they are almost universally applicable to any manufacturing company as they fulfil tasks not specific to any industry. The job of Product Owner, for example, can be practised in any industry, as there are product types everywhere. For this reason, sector-specific features are not analysed.

The analysis revealed no evidence of regional differences in the jobs of the future. It is only the existing territorial characteristics that are reflected in the analysis. In Budapest, for example, the service sector is much more pronounced than in other regions, so that respondents from the capital tend to consider occupations that are more specific to the service sector to be important. In addition, the Western Transdanubia region stands out with jobs somewhat more closely linked to the manufacturing industry. However, it should be emphasised that these differences are not so pronounced as to be considered regional differences.

We only considered jobs for which at least five responses were received, i.e. we analysed 28 out of 63 jobs. The study confirmed that there is some overlap between the jobs, i.e. there are some tasks that were typically mentioned together by the respondents. The following structure can be created on this basis:

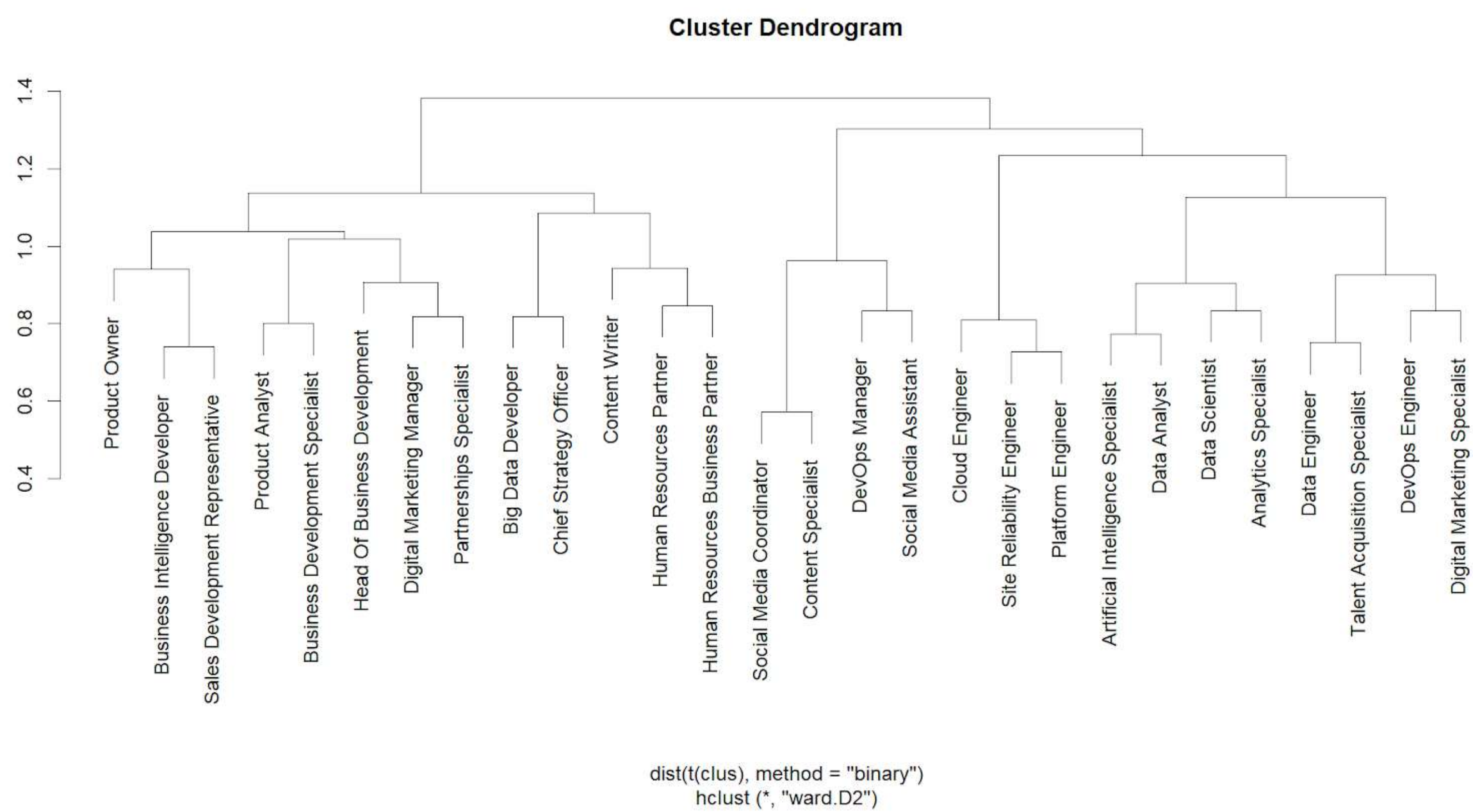


Figure 23. Structure of the jobs of the future by co-mentions

Two groups can be clearly distinguished. One group (on the left-hand side of the figure) is specifically related to production management. It can be seen that the tasks are related to the job of a Product Owner, i.e. the product and the related sales, customer relations and strategy development. This also includes jobs related to HR management. This cluster can be clearly assigned to the service department or the operations department of companies when the product to be sold is already finished.

The other group, on the other hand, belongs more to the job of a Business Analyst (the segment on the right). These include jobs, particularly in the areas of analysis and development, which can support the company's activities in all vertical areas. Interestingly, the first group typically includes jobs with a business degree, while the second group also includes engineering jobs. It is certainly worth noting that marketing and other related activities (such as Content Specialist) were included in the second and not the first group. The reason for this is not clear, but this second group probably includes the digital branch of marketing, which requires digital knowledge and development skills that are not necessarily part of "traditional" marketing knowledge.

The analysis was also carried out using the multiple correspondence method to obtain a map of jobs. This shows that the companies surveyed are largely in agreement regarding jobs. The jobs that will be needed by all companies in the future are those that are located around the zero point of the diagram; then the jobs are spread in two directions. Although the divergence may appear quite obvious at first glance, it only affects a relatively small number of respondents. At the same time, these few companies clearly stand out from the others. On the left-hand side (top left of the coordinate system) are mainly jobs in the fields of technology and IT, while the right-hand side is dominated by jobs that are more likely to be performed with a business qualification.

The jobs that received the most votes were Data Analyst (17), Cloud Engineer (16) and Business Intelligence Developer (16), meaning that jobs with engineering and IT qualifications will be the big hiring challenges of the future.

Summary

The COVID-19 epidemic has significantly transformed the labour market. To map the situation in Hungary we conducted a comprehensive survey to identify regional differences and the jobs of the future.

MAIN FINDINGS OF THE SURVEY:

Labour shortages: 80% of companies indicated that they face labour shortages. The situation is most acute in Budapest and the Western- and Central Transdanubian Region.

Wage problems: wage demands are high and do not necessarily reflect the experience of workers.

60% of respondents expect wages to continue to rise in the coming year.

Lack of experience: Finding experienced workers is a problem in almost all regions.

70% of respondents indicated that recruitment's biggest challenge is finding workers with appropriate skills.

Regional disparities: The North of the region is better placed than the rest of the regions in the market. Labour shortages are less acute here, wages are lower, and it is easier to find experienced staff.

Jobs of the future: The respondents agreed on the nature of key future jobs. Data analysts, cloud engineers, and business intelligence developers will be the most demanded positions.

Key Conclusions:

- The Hungarian labour market is tight, and labour shortages continue to rise.
- Wages continue to rise, but the appropriate experience is the bottleneck of recruitment.
  There are significant regional disparities in the labour market.
  Employers in the Northern Great Plain are in the best position to take advantage of the available workforce.
- The jobs of the future will be digital and automated.
- Targeted programmes are needed to reduce regional disparities.
  Education will play a particularly important role in preparing people for the jobs of the future, especially those entering the labour market. Vocational education and training can be improved greatly.

Recommendations:

- To make the labour market more efficient, the mismatch between the education system's output and the labour market's demand has to be reduced significantly or eliminated.
- In addition to wage increases, employers should also use other incentives to retain workers. Targeted programmes are needed to reduce regional disparities.
- In order to prepare for the jobs of the future, workers need to upgrade their skills continuously.

IMAGE CATALOGUE

4-5. oldal_Joel Filipe: Gray steel structure scenery
https://unsplash.com/photos/gray-steel-structure-scenery-SIyGeJeWAcY

6-7. oldal_Jonas Jacobsson: Black chair lot
https://unsplash.com/photos/black-chair-lot-2xaF4TbjXT0

8-9. oldal_Mike Kononov: Architectural photography of building with people in it during nighttime
https://unsplash.com/photos/architectural-photography-of-building-with-people-in-it-during-night-time-lFv0V3_2H6s

10-11. oldal_Hal Gatewood: Aerial photography of people
https://unsplash.com/photos/aerial-photography-of-people-Nzb4LBsctyQ

12-13. oldal_Joel Filipe: Psychedelic glass wall
https://unsplash.com/photos/psychedelic-glass-wall-Wc8k-KryEPM

14-15. oldal_D koi: A close-up of a wire
https://unsplash.com/photos/a-close-up-of-a-wire-J7UzOW6rzyk

16-17. oldal_Parsoa Khorsand
https://unsplash.com/@parsoakhorsand

18-19. oldal_Hal Gatewood: Aerial photography of people
https://unsplash.com/photos/aerial-photography-of-people-Nzb4LBsctyQ

20-21. oldal_Marten Bjork: High-angle photography of architectural building
https://unsplash.com/photos/high-angle-photography-of-architectural-building-j0Da0mEplnY

22-23. oldal_Nacho Capelo: Orange stadium seats
https://unsplash.com/photos/orange-stadium-seats-hMXuZrfmCWM

24-25. oldal_Loïc Fürhoff: Time lapse photography of people passing on bridge
https://unsplash.com/photos/time-lapse-photography-of-people-passing-on-bridge-qeIaMQP_xQE

26-27. oldal_Timon Studler: People walking on grey concrete floor during daytime
https://unsplash.com/photos/people-walking-on-grey-concrete-floor-during-daytime-ABGaVhJxwDQ

28-29. oldal_LYCS Architecture: Clear glass building interior during daytime
https://unsplash.com/photos/clear-glass-building-interior-during-daytime-aKij95Mmus8

30-31. oldal_Shahin Khalaji: Man in white thobe walking on grey and yellow concrete pavement
https://unsplash.com/photos/man-in-white-thobe-walking-on-grey-and-yellow-concrete-pavement--NtD0kE7WsI

32-33. oldal_Edwin Andrade: People raising their hands
https://unsplash.com/photos/people-raising-their-hands-4V1dC_eoCwg

34-35. oldal_Adrian Sulyok: Person in blue jacket walking on gray concrete floor
https://unsplash.com/photos/person-in-blue-jacket-walking-on-gray-concrete-floor-fgInNyYt2A8

36-37. oldal_Tomasz Frankowski: Gray conveyor between glass frames at nighttime
https://unsplash.com/photos/gray-conveyor-between-glass-frames-at-nighttime-kBUfvkbFIoE

38-39. oldal_Tom Parkes: Man walking through pathway
https://unsplash.com/photos/man-walking-through-pathway-Ns-BIiW_cNU

40-41. oldal_Rachael Ren: White tiled hallway with white tiled walls
https://unsplash.com/photos/white-tiled-hallway-with-white-tiled-walls-U94eGGi_1ZY

42-43. oldal_Susan Q Yin: Red and blue lighted room
https://unsplash.com/photos/red-and-blue-lighted-room-uHb0qFuA--w

44-45. oldal_Nick Reynolds: Woman standing near white wall in timelapse photography
https://unsplash.com/photos/woman-standing-near-white-wall-in-timelapse-photography-Im997E8lWho

46-47. oldal_Justin Lane: Black and white LED light
https://unsplash.com/photos/black-and-white-led-light-lwwM_dotpcs

48-49. oldal_Alina Grubnyak: Low-angle photography of metal structure
https://unsplash.com/photos/low-angle-photography-of-metal-structure-ZiQkhI7417A

50-51. oldal_Alex wong: Worms eye view of buildings
https://unsplash.com/photos/worms-eye-view-of-buildings-l5Tzv1alcps

52-53. oldal_Ryoji Iwata: Aerial photography of people walking in the intersection street during daytime
https://unsplash.com/photos/aerial-photography-of-people-walking-in-the-intersection-street-during-daytime-vWfKaO0k9pc

IMAGE CATALOGUE

54-55. oldal_Dominik Leiner: Grayscale photo of several people walking on pathway
https://unsplash.com/photos/grayscale-photo-of-several-people-walking-on-pathway-GOLuMSyBuSM

56-57. oldal_Aron Yigin: Gray concrete building under blue sky during daytime
https://unsplash.com/photos/gray-concrete-building-under-blue-sky-during-daytime-amBvaOYIRLY

58-59. oldal_Nina: Blue and white neon lines digital wallpaper
https://unsplash.com/photos/blue-and-white-neon-lines-digital-wallpaper-JPiT9saYFPE

60-61. oldal_Michael: A building that has a lot of windows on it
https://unsplash.com/photos/a-building-that-has-a-lot-of-windows-on-it-48yI_ZyzuLo

62-63. oldal_Headway: Crowd of people sitting on chairs inside room
https://unsplash.com/photos/crowd-of-people-sitting-on-chairs-inside-room-F2KRf_QfCqw

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