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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE WORKPLACE: CURRENT STATE AND FUTURE PERSPECTIVES

by Ivan A. Lyapin

Abstract. Rapid technological developments in Artificial Intelligence technologies and its multiple applications on the workplace have stoked many fears and speculations in the society about possible job loss. Current studies report no decrease in demand of high-skilled workers associated with AI technologies. Also, there are no evidences that they will displace jobs in the near future. More companies keep on using and scaling AI in nearly every industry. Most of the businesses are getting benefits after implementation of AI. Most of the progress AI made relate to highly-educated and skilled occupations. To develop further, companies should decide which tasks and routines to be performed and delegate them to humans or robots. AI will not only lead to automation, but will also complement labor. Implementation of AI technologies widely across all industries still face challenges. Part of the limitations is technical related, there are also potential issues with data protection, its fraudulent use and cybersecurity are the main challenges to focus. Businesses and authorities should harness AI development and benefit from the increased productivity and working performance. Focus should be on ensuring the transition to new technologies is smooth and stressless.

Keywords: Artificial Intelligence, Workplace, Labor Market, Occupational Exposure

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Introduction

Recent technological advancements in Artificial Intelligence (AI) initiated numerous discussions about large-scale job loss, because of its ability to automate a wide and continuously expanding set of tasks, and its potential to affect every sector of the economy.

Furthermore, use cases of the recent decade raised the concerns about employee well-being and the broader work environment, keeping in mind the opinion that AI may soon become commonly used in the workplace and threaten and humans' place in it. However, there is a possibility for AI also to complement and augment human capabilities, leading to higher productivity, greater demand for human labor and improved job quality.

From one perspective, dynamic development accompany technological change and create uncertainty about the future of work. On the other one, many authors agree that occupations are best understood as abstract sets of skills and that technology directly impacts demand for specific skills instead of acting on whole occupations all at once.

This article studies the views on the current level of AI technologies implementation, recent changes in workforce composition due to technology advancement, analyzes the sectors which are most exposed to working environment automation using new technologies. Then it provides the outlook on the possible changes on the workplace and working force requirements, summarizes the challenges of rapid implementation and provides recommendations to address the challenges.

Current changes in the workforce composition

In the recent period AI has made the most significant progress in occupations that are associated with non-routine and cognitive tasks that are usually performed by medium and highly skilled employees. This type of workers rely on abilities AI currently cannot provide, such as inductive reasoning or social intelligence. On top of that, it is easier for educated workers to adopt and learn new technologies and tend to participate more on new trainings which puts them in a better position to use the opportunities provided by AI on the labor market.

Studies, performed in 2022 in changes of workforce composition and workflow accompanying AI investments provide the view of how AI can transform the workplace, production processes and organization [6]. As a technology applicable mostly to work with cognitive abilities, AI improves the ability of a person to make decisions, which, in its turn, increases the autonomy of the workforce in predictions and reduces the demand for managerial staff.

Comparing to the previous automation technologies that contributed to productivity improvement, development of AI technologies is not associated with decrease in demand of high-skilled workers at the organizational level.

Studies also help to make conclusions about influence on the labor market. AI is associated with the high-skilled labor and there are no evidences that it will displace tasks that are commonly predicted to be displaced by AI, such as routine tasks for human resource, legal, administration. We will further shed the light on how AI is influences the jobs at non-AI investing firms and on the overall effect on the labor market as a whole.

Other studies show a substantial growth in need for skills associated with AI [5]. The number of positions requiring AI skills has increased ten times from 2010 to 2019 and four times as a percentage of all vacancies posted.

A large share of job postings is focused in Information Technology, Professional Services, Finance and Manufacturing sectors, but the increase in demand is visible in the other industries. Likewise, the demand in AI skills is following from Computer, Engineering and Science occupations and also in such occupations as Farming, Forestry and Fishing which had almost zero demand for AI skills when the observation started.

In job postings studied with comparable other skills, the addition of AI skill requirement increases the offered wage by 16%. Controlling for firm fixed effects, the AI wage premium is almost 20%. This premium is significantly higher than premium for other skills in the analysis.

There were also findings in substantial wage premium for non-AI associated occupations in the firms with higher AI investment intensity. Findings suggest that jobs that require software, cognitive, social, project management, and people management skills are complementary to AI jobs, while jobs requiring customer service skills might be substituted by AI.

Recent studies [1] formulated more formally the explanation which is traditionally used as an argument why technological progress and labor-saving practices are not followed by job losses: productivity increase is resulting in higher fuel demand in the economy in general and generates more job openings, although, as a rule, in areas other than where the initial performance improvements occur. There are numerous ways in which productivity improvements and demand can be linked.

AI at the workplace current use cases

AI adoption is on the rise in almost every industry, but opportunities are different.

The research and survey made by McKinsey & Company shows the results that the organizations implemented at least one of the AI use possibilities into their day-to-day operations of product process at least for one work function or department. Responses also show the share growth of firms applying AI in their processes or

products within different functions [22]. This is an indication that more companies are utilizing and scaling AI. Highly intensive in AI implementation companies are much further in these efforts.

Analyzing different industrial sectors, we can notice increases in AI implementation almost in every industry in the recent years. Among the grow leaders retail is the top performing sector where companies introduced one or more AI applications in at least one function or department.

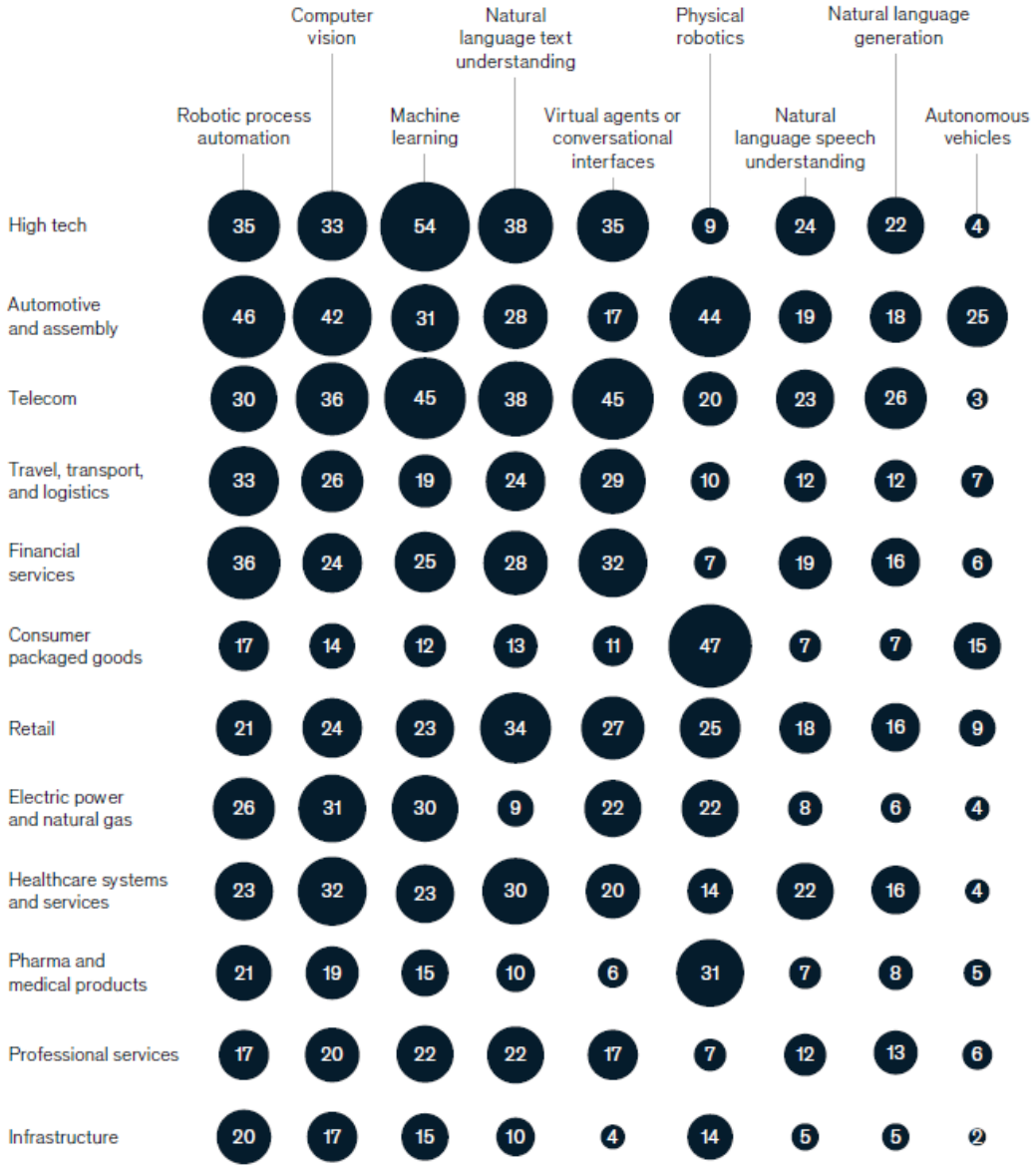

Exhibit 1. Industries generally using AI capabilities.

By function, we find the most use cases in operations (RPA, predictive maintenance, production analytics, inventory and supply chain, robotics, invoicing), general solutions (analytics, automated machine learning) and specialized solutions (geo-analytics, conversational analytics, image recognition, e-commerce analytics), marketing (personalized and context marketing, analytics), sales (forecasting, lead generation, data input automation, lead scoring, agent coaching, sales analytics), customer service (social listening, ticketing, call routing, voice authentication, responses, chatbots, call, survey and review analytics), HR (hiring, performance management, retention management, employee monitoring, building management, HR analytics). There are also numerous use cases in Tech, Data processing and other innovative functions.

We see that firms adopting AI technologies in the areas that support them in their industries to capture value and benefits. For instance, respondents representing FMCG companies claim higher use of physical robots, which are usually more often used in production and assembly, than any other application opportunities. Respondents representing telecom industry inform that using virtual agents is common for their companies, which can improve customer-service operations, more frequent than most of the other capabilities (Exhibit 1). Other high-performing companies report that they implemented AI in sales and marketing.

Analyzing the report by geography, we see the results that show that the share of AI adoption increased substantially in technologically advanced countries of Europe, Latin and North America, Asia-Pacific. High level of AI implementation puts these regions together with China at the similar level of AI introduction and implementation at the workplace stating that AI is a global phenomenon at the workplace while the intensity on the company level may vary significantly.

AI implementation champions tend to apply value-capturing techniques

From several researches and studies we see that most of the firms' activities are essential to fix the value at scale. In many cases these are analytics, business alignment and IT leaders focus on potential to capture value from AI applications in every business sector. Activities include, but not limited in investing in talent and ensuring that business and technical staff have the skills for successful scaling. The survey studied suggests that these practices are essential for scaling AI, but it is necessary to keep in mind that respondents of the survey are more likely to say their companies utilize such practices.

However, even AI high performers say that their most skilled staff use insights they got from AI for daily tasks in decision making and less than a half systematically track a well-defined set of KPI's for AI, two practices, according to McKinsey, that are critical to achieving acceptance and value by end users. In a similar way, only 35 percent of high-performing AI respondents declare that they have an active continuous training program for their workers on AI technologies [22].

Occupational Exposure to AI

Many companies across the globe are currently implementing AI in the workplace alongside with significant investments in its adoption and implementation making AI a part almost of every stage of employees' work. It is widely used in recruiting and onboarding, in talent development and process management.

AI becomes the main tool either to fully automate the working process or enhance and assist the workers in performing their tasks by using robotics, process automation and other technologies.

The activities AI has made the most significant progress in relate to highly-educated white-collar occupations. Thus highly-skilled occupations are among those with the most significant exposure to AI technologies. These are Science and Engineering, Business and Administration professionals, managers, Executives, people working in Legal, Social and culture.

On the other hand, occupations where exposure is lowest representing professions where people are involved in physical activities. Such as: Cleaners, Agricultural workers, Forestry and Fishery Laborers, Food cooking workers. These professions rely on the abilities where AI has not been implemented much so far.

The research shows how AI exposure is distributed across different countries. In most of the cases, an occupation's exposure to AI is not high, fundamental differences between occupations are usually higher [21]. We can notice slight difference in AI occupational exposure between Baltics and Northern Europe countries analyzed. Also, studying the exposure between occupations, we can notice that distributions across occupations in most exposed and least exposed countries are very similar. Exposure will keep on being different across regions and industries due to differences in many social and economic factors, different labor markets and their dynamics: in developed economies with quite high salary levels, the exposure could be more than two times higher than in such countries as India.

AI technologies are rapidly spreading around the glove and are expected to have big effects on world economy. Giving the effect that we can suspect; it has become critical to have data that allow us to study possible effects. Much of the work to be done to identify the possible influence of AI to the labor. Therefore, it is becoming increasingly important to be able to operate with trusted and reliable global data.

Drivers for AI implementation at the workplace

Most businesses can see the payoff from AI.

With a reference to research, conducted by McKinsey & Company where they studied about 33 cases of AI implementation in eight business functions. They also studied the effect of implementation of AI in each of these activities on the revenue and cost in the departments using AI [22]. Hereby, we provide the results which concluded that AI is delivering a significant value for companies.

A significant share of respondents reports that adoption of AI technologies in the companies increased the revenue on more than 10 percent. The most gains are reported from AI used in sales and marketing (price policies, probability of making a purchase), supply chain management (sales and demand forecasting), product and service development (designing the AI based products new for the markets). In its report Accenture estimates that the firms intensively investing in AI-based technologies can boost sales revenues by 38 percent [37]. There is also an opportunity to increase the employment level by 10 percent.

Additionally, about a half of participants report cost reduction resulted from AI implementation. The most cases of cost saving can be found in manufacturing (optimization of the output, energy and overall capacity) and supply chain management (supply chain optimization).

AI provides analytics that help humans to take sound decisions.

The benefits of new human-AI collaboration are getting clear. A good example is the recent AI-based algorithm developed by a team of scientists from Harvard aimed to identify breast cancer cells with higher precision. When we compare human performance versus AI's, pathologists identify the decease with 96 percent accuracy while algorithm alone do that in 92 percent of the cases. But when human-AI alliance is performing the job, accuracy of diagnostics increases up to 99.5 cases for cancer biopsies identification.

Such a successful use case could be created due to human-AI ongoing collaboration and training to help improve the effectiveness of it.

Economy and society as whole are getting more opportunities from AI intensification.

Besides value for businesses, as it was already mentioned above, AI technologies make impact on economy, supporting its growth and may provide a significant progress on most societal challenges. It can influence aging and contribute to birth rates increase, labor productivity, which is one of the major factors of economic expansion. AI is also finding applications in many other areas: medical researches, climate exploration, material science etc.

Future and trends of AI at the workplace

We can definitely say that the future is uncertain not just with respect to workplace, but almost to any sphere of life. And it is also hard to be certain what to do about the future. But it is important for us to take the guess about the future. With regard to workforce economic outlook, the experience we possess does not allow to predict the type of jobs which will be in high demand in the distant future. Even if could have reasonable understanding which jobs will be eliminated in the future, we need to be reasonably sure which jobs will be demanded then.

To make the forecasting more effective and accurate, it might make sense to plan the future on the individual company level rather than the economy as a whole. From the previous paragraphs we know that the firms with AI-focused strategies and

investments are better suited and prepared for the new technologies adaptation and better suited to new approaches. Furthermore, if we make an assumption that AI-based technologies may decrease future jobs demand, it looks much more effective to make the development program on individual employer's level because region or global-wide forecasts may only be used by the small group of employees at any time. Also, in case an individual wishes to have a transition from one role to another, it is much easier to do within the same organization where their company specific skills and knowledge remain relevant and demanded.

To address the issue of uncertainty, first of all, we must admit that even presumably good forecasting models provide us the most probable outcomes or estimations of the most likely solution of our problem. Practical experience has shown that in many cases even the most probable outcome is not that likely, this is why it is important to forecast second and even the third most probable solution. To address these outcomes, scenario planning is one of the possible techniques. Another one is simulation, where we can create the forecasting model and see the possible outcomes by changing the values of initial variables.

Without doubts, companies have to be ready to face major changes at work. It would be possible to automate about fifty percent of the activities (not jobs themselves) carried out by workers and assistants. The research of 2 thousand work activities within 800 occupations provides the data about certain types of activities that are easier to automate [3]. These are physically performed activities in fixed and stable environments, data gathering and processing. These may be roughly estimated as a half of all activities people perform across all industries. The lease threatened activities include taking decisions, providing expertise, communicating with stakeholders. Taking into account current level of technologies, it is possible to fully automate only 5 percent of currently existing professions, but almost all of them will be affected in the future.

Can AI help to solve labor market issues? Most of the companies using AI technologies at the workplace tend to think so. They are either increasing the intensity of AI use to reduce general hiring needs or on their way to develop a plan to use it. As was already mentioned, AI comes with its own challenge for labor market: the need to recruit skilled and often expensive AI talent. There is a number of cases when companies slowed down their recruitment process because of the limited availability of AI talent. Nonetheless, despite that the demand for AI and data science staff is continuously increasing, there are ways to mitigate the recruitment slowdown.

Below are our recommendations of how companies could prepare their businesses for the future.

Businesses should reconsider the tasks to be carried out.

It is recommended to reassess the set of human teams and technologies available to allocate the tasks and activities to humans or robots. This is not a one-time-task, the process of such allocation should be ongoing to increase the its efficiency. Most of the existing AI are not able to work autonomously and require human assistance

to interfere, input data, make necessary corrections in their operations. In many cases where AI is supposed to take the decisions, it should be train by the people to have the results of their work acceptable and useful for further use.

AI will not only lead to automation, but will also complement labor. As another example of human – AI collaboration, we can provide the case when an analytic needs to write a report based on dataset provided and collected by AI (high suitability for machine learning) but then provide recommendations and guidance in it which will require abstract reasoning and perceived to come from a human. AI is expected to increase productivity not only by enabling companies to replace labor with cheaper capital, but also by complementing workers enabling them to increase their productivity by leveraging their social interaction skills and ability to reason about novel situations.

Companies need to implement AI Governance.

To stay tuned with continuously evolving AI models, companies need to deploy the governance models specifically designed for AI application which may influence all the relevant stakeholders. The governance should include the risk, AI and business leaders with new policies and procedures, roles and responsibilities. An example of possible governance model to be used is Three Lines Model which was developed in 2008-2010 by the Federation of European Risk Management Associations and was adopted by the Institute for Internal Auditors in 2013. The model describes three lines of defense to apply for AI Governance:

- Creators, Executors and Operations
- Managers, Supervisors and Quality Assurance
- Auditors and Ethicists

In addition to three lines model, it is also recommended to use end-to-end governance model. It includes all the stages of organization's lifecycle.

Also, despite the possibility to employ and enhance much of the existing IT governance and controls, it is very important that business leaders learn and understand some AI and data science basics.

Companies need to understand their unique vulnerabilities.

Companies acting in different sectors of economy, such as finance, retail, utilities etc., all face different kinds of risks from potential AI implementation: where it could interfere into data sets and cause serious damage. It is important for the companies to identify their unique vulnerabilities and define the risk from their specific AI algorithms potentially to be used. It is effective to estimate the value of the possible resulting financial, operational and reputational risks and the value of its mitigation to take the decision about AI implementation and prioritization of efforts.

Companies need to control their data.

Most probably, the traditional ways to control the data handling are not sufficiently robust to detect particular problems that can cause the risk associated with AI use. It is important to pay special attention to issues in historical data and data

acquired from third parties. When implemented, AI algorithms may creep the data sets and allow to take biased decisions, therefore, they must be well designed and managed from a very beginning.

Companies need to focus on employees.

The shortest way to implement AI at the workplace is to address AI talent shortage. It is important to take and hire new specialists who already have the skills you will need or can easily acquire them. Companies should consider teaching data science, machine learning, software engineering, statistics and business leaders a little of all from these fields. Such approach can also help to fill the communication gaps and increase cooperation between the groups that work with AI.

To mitigate the possible risks of biased AI at the workplace companies need to diversify their teams with people with different backgrounds, gender, races. A diverse team bringing together business leaders, data scientists, engineers and other professionals with different backgrounds and experiences will allow different views on the possible threats and ways to mitigate them.

By implementing AI, companies will be able to reduce the need for routine work and make the life of their employees easier and more engaging. By announcing the plans and starting the process of AI implementation, companies can increase the value the employees can give to them. AI can even help provide emotional support at the workplace thus making employees happier.

Companies can assess and predict ROI of AI.

There is no need for companies to implement AI models which don't focus on important business issues. The more complex the task the more important that businesses aim at the right issue to solve. It is hard to quantify and measure AI's ROI which are often initiated by strategic decisions or disruptions which never existed on the market. However, businesses now are more likely to measure the value of impact using new assessment methods. These can capture not just "hard" returns, such as increased productivity, and "hard" costs, such as new hardware spending. They can also capture "soft" returns, such as an improved employee experience, and "soft" costs, such as increased demands on subject matter specialists' time. The holistic approach to AI, many existing use cases and practices also help to estimate the ROI of new initiatives. It is also possible to use AI itself to model the impact and uncertainties of AI initiatives and help to better allocate the resources.

When modelling it is important to make sure that all different approaches and possible changes are tested and their impact is measured.

It may also be useful to consider portfolio approach to avoid ROI surprises as companies may also work with product innovation: create and assess a mix of initiatives that will raise the likelihood of delivering the overall results companies need.

And we will finish from what we started: to effectively and precisely predict AI's ROI, companies need to manage and govern not individual projects, but full life-cycle. That can help them continually evolve strategy, fine-tune execution and find new use cases for data — both avoiding downside surprises and identifying new value.

Influence on employment

Despite the fact that AI is considered to be an emerging technology, it is already driving a strong demand for related talents across many industries [36]. It is already here to stay in numerous economic sectors. This demand is predictably high in Scientific and Technical services sectors, it also shows high levels in Manufacturing, Finance and Insurance and administrative ones. Information sector is the sector people intend to go first when they think about AI. However, there is a little empirical evidence how AI influences the labor market to date and it will transform it in the future.

Jobs lost: by 2030 some occupations are expected to have significant declines.

Rapidly developing AI technologies will displace some people. Research shows that about 15 percent of all the workers, or about 400 million people, could loss their workplaces because of AI in the period 2016–30 [3].

The technical possibility to automate the jobs is the main reason that causing the decline. There are also other reasons, such as development cost, labor market changes caused by the quantity and quality of labor supply and its corresponding wages, the gains due to human displacement that are mentioned in the adoption use cases and last but not least, acceptance by society and its norms.

Jobs gained: There will be more jobs created during the same period.

Despite that many jobs are expected to be displaced, the increasing demand for work is predicted which in its turn will provide more jobs. Such factors as higher spending on social needs, growing incomes, expected new investments in significant projects in energy, infrastructure, development of new technologies and their practical applications, contribute to this statement. The main beneficiaries from these changes are going to be emerging economies, such as numerous Asian countries where the working age population is increasing dramatically. Such a growth in economy and population will affect business dynamism and influence the productivity increase and will keep on the growth of new jobs on the market.

Jobs changed: Jobs are expected to change as technologies will collaborate with humans at the workplace.

There will be evident benefits from human labor complementation by machines and this factor will cause partial automation to prevail. Dealing with repetitive tasks will shift current jobs to automated systems troubleshooting and maintenance.

Challenges of AI implementation and its mitigation

Implementation of AI technologies widely across all industries still face challenges. Part of the limitations is technical related, such as need for significant data training and difficulties to apply same algorithms across different applications. It is hard to identify all the issues related to recent innovations. Potential issues with training data, algorithms optimization, private data protection, fraudulent use and security are the main challenges to focus.

However, we can highlight the main challenges companies are facing now. The set of occupations is expected to change as well as requirements for working skills and educational background. Working activities will have to be reconsidered to make sure humans and AI collaborate most effectively.

Higher emphasis on new skills trainings is expected.

Results of the research report that the majority of firms are getting ready for AI-related personnel changes [22]. About 60 percent of respondents claimed that their companies adopting AI have workers retrained during the past year. On top of that, 83 percent of research participants have plans to retrain some of their workers in the next three years because of AI implementation and 38 percent have plans to retrain more than a quarter of the staff.

AI technologies at the workplace will increase the pace of shift in skills demanded. Requirements for technical skills will grow rapidly. The demand for cognitive skills, such as analyze of information, critical thinking, creativity will grow as well. This will put a greater pressure on the existing workforce and firms to develop the solutions that scale its skills along with the progress.

Some workers will probably need to reconsider occupations.

Requirements to change and develop new working skills may lead to the need of change of occupational categories. Some of these changes are expected across sectors and companies, but we should also expect that many will happen within sectors and geographies. Occupations related to data processing and highly structured environments will see the decline, while occupations related to unpredictable environments will meet increasing demand for work. Some other demanded occupations will include teachers, managers, tech and other professionals.

Automation is expected to influence wages in advanced economies.

The change in occupational activities will likely to put pressure on wages. Highly automatable activities are the most likely to be substituted by AI and shift to higher skilled jobs will happen. The number of high wage jobs will increase significantly causing the rick that automation will increase wage polarization and income inequality.

Many economies are already facing the challenge to properly educate and retrain their workers to ensure they are able to meet the existing demands of employers [2]. In OECD countries, workforce education and training spending has been in decline for two last decades. Worker transfer spending and relocation support also kept on declining as a share of GDP.

In seeking solutions to problems, we must not slow down the continuous development and application of new technologies. Businesses and governments should benefit from developments in AI technologies that bring improved productivity and work performance not as well as social benefits. Focus should be on ensuring the transition to new technologies is smooth and stressless. Automation and productivity growth is a main contributor to job and economic development. This is why support of investments and new AI technologies development is crucial.

Addressing all the challenges it is important not to miss a critical observation: AI technologies will not much influence the quantity of jobs, but rather job requirements and tasks.

Below is the list with our recommendations of the areas where main efforts should be concentrated.

Fostering business dynamism.

The opportunity for entrepreneurship to develop further will result in new business formation which, in its turn, will create new jobs and increase working performance. Business dynamism depends on open and clear environment for small businesses and healthy competitive environment for large business. Simpler and better rules, tax and other incentives will be required to accelerate the formation of new business and increase the competitiveness of large and small enterprises.

Constantly improving education system and affordable trainings for changed workplace.

Businesses together with authorities could contribute more to development and evolve basic and advance skills via school educational systems and corporate trainings. A new focus on creativity, critical and systems thinking, and adaptive lifelong learning is required.

Human capital investments.

As mentioned above, much attention should be paid to the training of employees. Governments and authorities are able to encourage businesses to invest in human capital by introduction of new tax incentives and benefits. Other ways to support are jobs creation, building capabilities by providing training, increase wages, make investments in other types of capital, not forgetting about R&D and technologies.

Workplace redesign.

Working process and workplace itself will require to be redesigned to satisfy the new ways of working where humans collaborate with the machines and algorithms. This is quite a challenge to fulfil safety requirements while designing creative environment. Companies are also changing as working process involves human-machine collaboration more than before and organizations are transforming to agile ways of working with less hierarchy.

Properly planned and smooth transition for workforce affected.

As the technological progress is expected to cause the change of industry, place of work and, in some cases, occupation itself, many people will require support to have such a transition smooth and less stressful. Special transition programs should be developed, tested, adopted and implemented to ensure this. Respectively, new programs will require development of new systems and approaches.

Demand for work incentivization.

Decision-makers should consider the ways to increase the demand for work. One of the approaches is new investments in infrastructure, climate change measures and other investment intensive projects. The type of jobs created in such cases will mostly be middle-wage jobs, which are expected to be most affected in other sectors, such as construction, engineering systems installation etc.

Safe implementation of AI.

While we are taking advantage of the performance benefits of these rapidly evolving technologies, we need to proactively guard against risks and mitigate any hazards. Working with data is always associated with risks which have to be taken into account. These are data security, private data protection, fraudulent use, potential issues with bias. Governments, businesses and individuals should address all these issues effectively and responsibly.

Organize for agility.

Because workers are suggested to do more creative work and projects and involved less in repetitive work, it is recommended that they do that with higher autonomy and decision-making opportunities.

Corporate culture is an essential and important point in this case. To encourage creativity and experimentation it is required to cultivate open culture which should extend to involving people in making decisions that will change their work environment and the tasks they perform. Companies should also change their workflow and structures that allow project teams to seamlessly assemble and disassemble, providing workers less traditional functional constraints.

Discussion

What is the future of the workplace is a topic which resonates broadly and has been discussed among different stakeholders: authorities, businesses and individual workers. For quite a long time, researches, authorities and consultants have been trying to define how the workplace might look like in the future and how to utilize it for the good of society and economy and how will its changes affect the individuals and youngest generations who will start working in the future.

Despite different opinions expressed, the common ground is that technological development is rapidly diffusing the differences between work done by humans and machines and algorithms which will result in global labor market transformation. If managed properly, this transformation could lead to the new era of work, new jobs and way people live. But in case of poor management, it may impose new challenges, such as greater inequality, wider skills gaps and society polarization. Undoubtedly, now is the time to influence the future.

While the detailed discussion of the possible effect of workplace automation in different countries is beyond this article, it is important to notice the effect of proper investments in AI technologies on labor costs and skills which we can foresee in advanced economies and make some conclusions already now. For instance, as one of the studies concluded, in 1997, value-added [35] per dollar of labor cost was twice higher in industrial manufacturing in Mexico than those in the United States. This difference had significantly decreased to less than 15% by 2013. Taking into account the amount of investments in AI technologies in developed countries, it is possible

to predict the shift in economical advantage in labor costs which will influence the industrial structure of developing economies, such as South-East Asia countries or other emerging economies through reshaping the work tasks in such industries as apparel, footwear, textiles or electronics assembly.

Our findings predict a dramatic increase in the demand for AI skills. The number of positions requiring such skills increased ten times from 2010 to 2019 and four times as a share of job openings [6]. The biggest share in AI-related job postings is from Information Technology, Professional Services, Finance and Industrial Manufacturing sectors the growing change in demand is visible almost in all industries, including, for example, Farming, Forestry and Fishing which had almost no opening few years ago.

It was also found that there are significant differences between businesses that are focusing on AI skills when looking for talents and those who do not pay attention to it. In a cross-sectional analysis, firms with higher market values, higher R&D intensity, and higher cash stock have a higher share of AI vacancies.

All in all, several studies show the significant increase of the recruitment of AI skilled staff. AI skills also provide a significant wage premium across different industries.

An evidence noted in the article of the workforce composition which go along with investments in AI technologies could also contribute to our understanding of how AI is shaping the work and production processes. As a predictive technology, AI improves the possibility of individuals to make predictions and take decisions which, in its turn, reduces the demand for managerial positions. Despite that, AI technologies do not lead to the decrease in demand of high-skilled workers, opposite, it is increasing the share of high-skilled workers on the company level. Further understanding of dependencies between AI technologies, operational processes and their impact on organization could be an interesting topic to study in the future.

However, it is already clear how important it is to develop and implement lifelong learning programs, reskilling and upskilling plans on the national levels. Taking into account recommendations given in this article, this could also be a fruitful are for future research. This research could lead to further collaboration between governments and corporate reskilling in selected countries and regions.

Also, rapid changes in new technologies resulting in shifts of the job roles and skills demand at a much higher speed than ever in the past. This is why the decisions and possible collaboration between businesses, policy-makers and individuals in the field of lifelong learning are getting higher importance and provide significant opportunities for future partnerships.

Conclusions

Automation and AI technologies are changing the economies and influence businesses, they are expected to contribute to economic growth increasing work performance and solving social issues. Along with this, these technologies are going to fuel the transformation of the workplace and to perception of work itself.

It is expected that AI will transform the labor market changing the set of skill requirements and mix of occupations. Yet it is not expected to lead to declining employment.

Serious declines are predicted for some occupations, but along with this, jobs of other types will appear. Workplace automation doesn't necessarily lead occupations to disappear. It rather leads to occupations transformation as the machines, algorithms and human labor will complement each other at the workplace.

It is in the responsibility of authorities and businesses to ensure this transition will happen smooth by creating the conditions and environments that foster innovations and new technologies development.

Workers may need to re-skill or up-skill in order to adapt to the reorganization of tasks and new tasks appearance, and to weather potential job loss and navigate transitions to new jobs. This will not only mean acquiring AI-related skills, but also acquiring skills in areas that AI cannot perform so well.

Productive collaboration between humans and robots will start the period of new work and provide competitive advantage. The potential of AI effective application depends on humans and machines collaboration which will help to create new end user experiences and to develop products, services and markets which never existed before. This provides the real opportunity of AI for human society.

As many companies nowadays have been involved in business digital transformation and workforce strategies, there is a big number of opportunities for them to leverage the utilization of new technologies, such as automation, to improve the creation of economic value by introduction of new activities, improvement of workplace qualities, change the traditional or create new occupations which have never been performed before by human workers to utilize the full potential of their workforce.

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