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# Izaicinājumi izglītības ekosistēmai: Radītā atšķirība un pievienotā vērtība

Ģirts Bērziņš  
20.10.2023.



# Catching Up with the Economy<sup>†</sup>

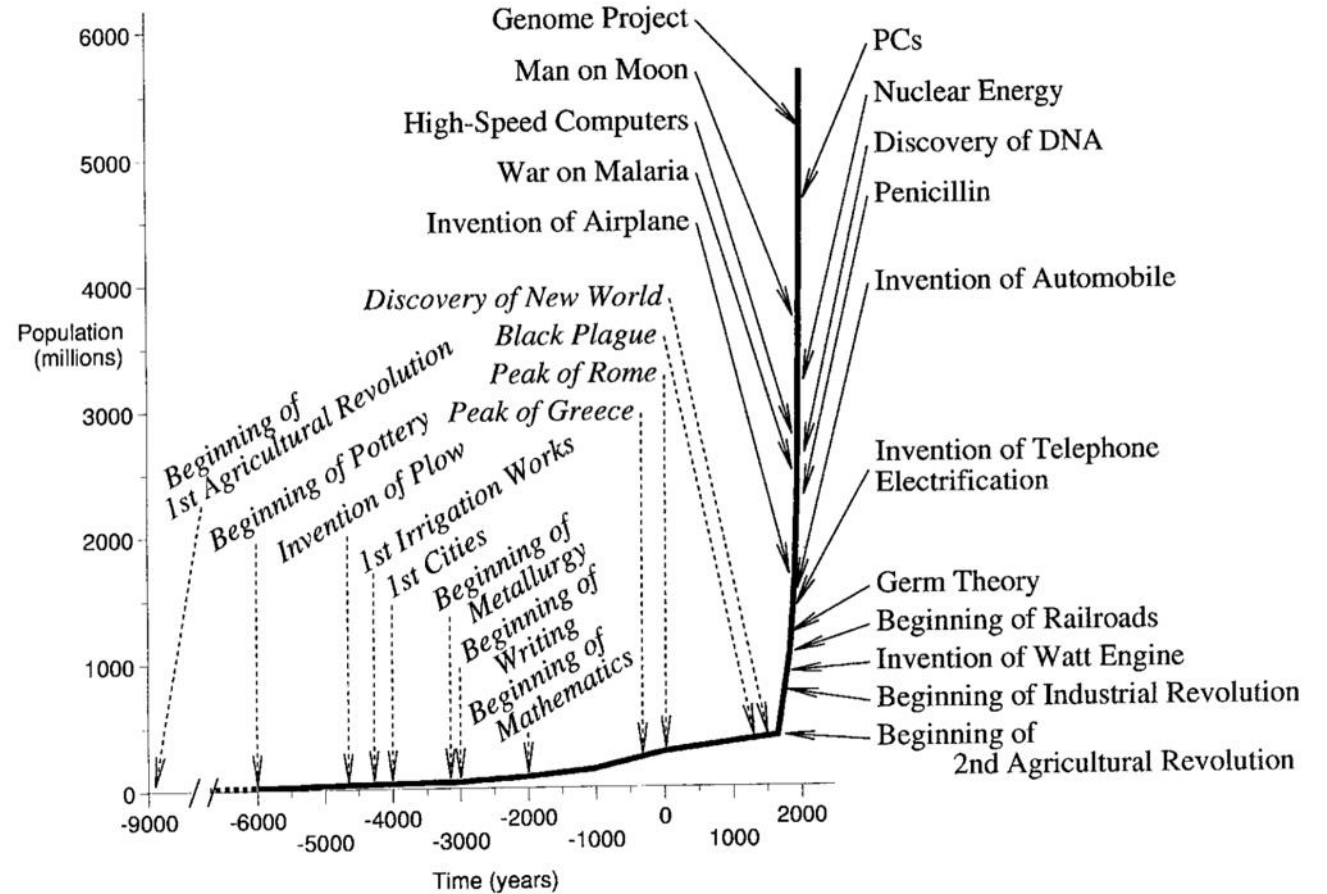
By ROBERT W. FOGEL\*

In his Presidential Address five years ago, Zvi Griliches (1994) called attention to the severe difficulties that beset current attempts to measure the growth of labor productivity in the American economy. Because of these difficulties, it is likely that the true rate of economic growth is substantially underestimated. The root of the problem is the difficulty in measuring output in the service sector which now represents two-thirds of the economy. In such sectors as health care and information services, the contribution to gross domestic product (GDP) is measured by inputs rather than outputs, a procedure that makes it impossible to gauge accurately improvements in the quality of output. Thus, in the case of computers, which are transforming American society, economists have been unable, so far, to find a measurable contribution of computers to the rise in labor productivity — an astonishing paradox.

I want to follow up on this problem of mis-measurements. My thesis is that the profession

is lagging behind the economy more than it has to. We are, to some extent, entangled in concepts of the economy and in analytical techniques that were developed during the first third or so of the century, when economics emerged as a modern discipline. The range of the discipline did not expand greatly during the middle decades of the century, due partly to a concentration on the reformulation of the previous analytical concepts and techniques in more sophisticated and more general mathematical models. Although the dividends from these efforts were high and have contributed to the flexibility and capacity of economics, they did not encourage a reconsideration of some of the received assumptions about the scope and focus of economic analysis. There has been a significant broadening of the scope of economics during recent decades, with the emergence of such fields as the new household economics, the new institutional economics, the economics of aging, and medical economics, but much remains to be done.

The balance of this address is divided into four sections. I begin with the inadequate attention to the *accelerating* rate of technological change, the implications of this acceleration for the restructuring of the economy, and its transforming effect on human beings. I then consider the neglect of the nonmarket sector of the economy, the implication of that neglect for the measurement of consumption, and for the analysis of economic growth. The third section deals with the need to shift the focus of economic analysis from cross-sectional to life-cycle and intergenerational data sets, especially in connection with forecasting. The final section points to the impact of cultural lag in the treatment of material inequality, and the neglect of the more severe problem of spiritual inequality. I use the word spiritual not in its religious sense but as a reference to commodities that lack material form. Spiritual or immaterial commodities make up most of consumption in the United States and other rich countries today.



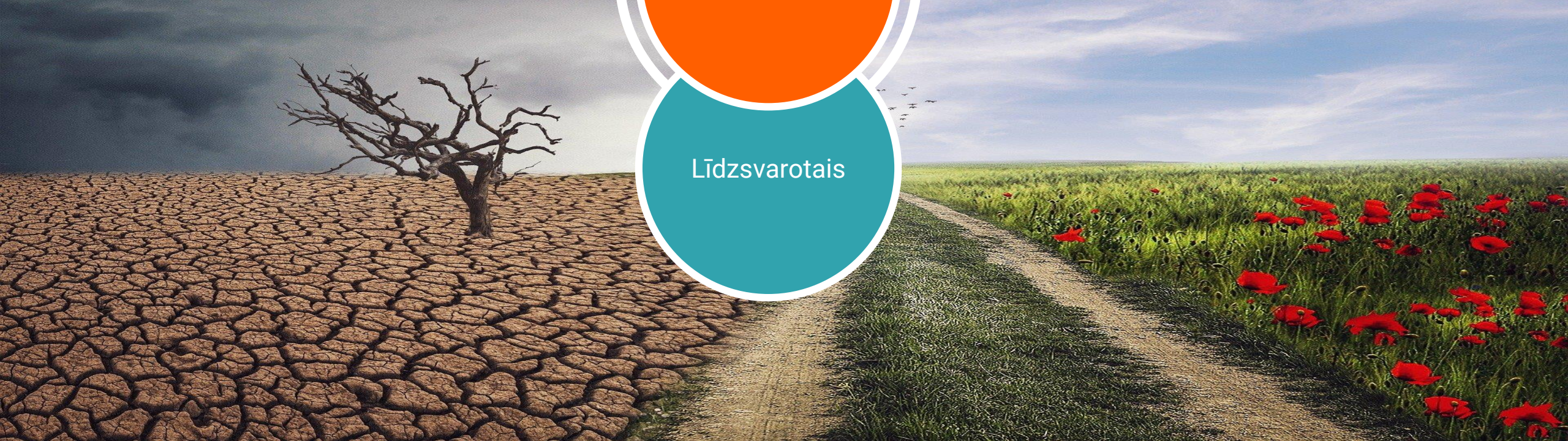
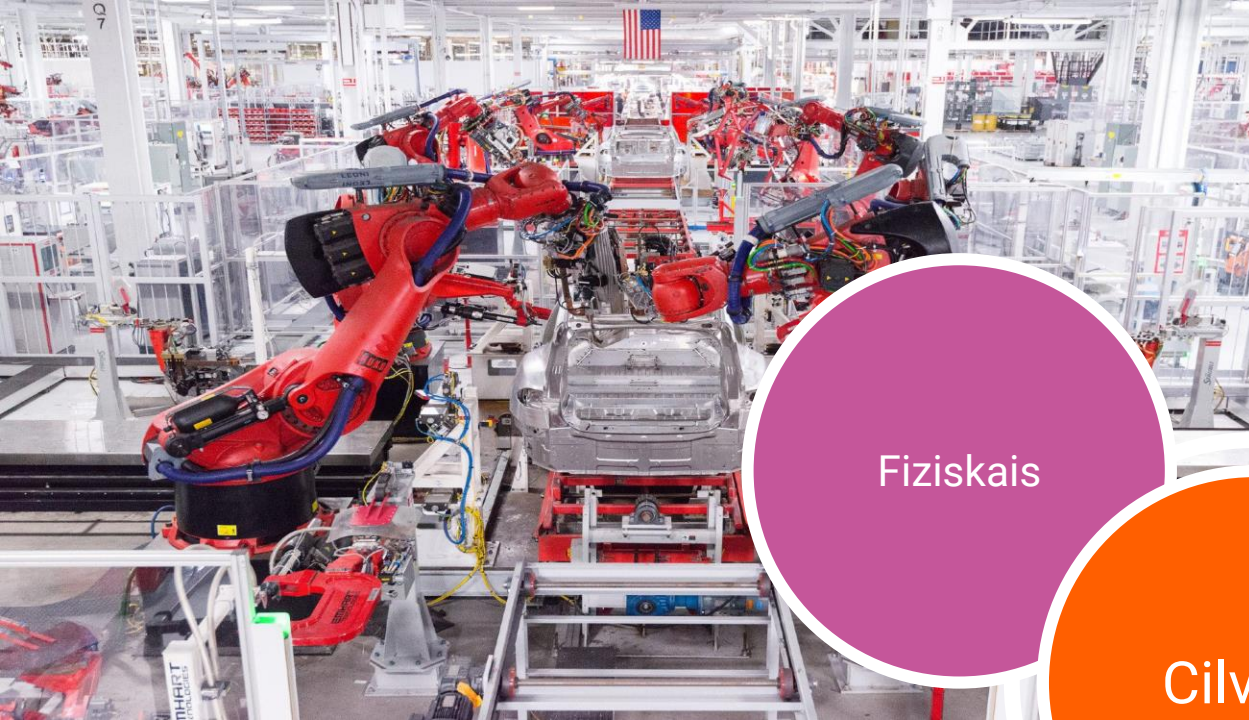
<sup>†</sup> Presidential Address delivered at the one-hundred eleventh meeting of the American Economic Association, January 4, 1999, New York, NY.

\* Center for Population Economics, Graduate School of Business, and Department of Economics, University of Chicago, 1101 East 58th Street, Chicago, IL 60637, and National Bureau of Economic Research. This address is based on research made possible by grants from the National Institutes of Health (AG10120), the National Science Foundation (SES-9114981), the Walgreen Foundation, and the University of Chicago. I am grateful to the University of Chicago Press for permission to make use of material contained in my forthcoming book, *The Fourth Great Awakening and the Future of Egalitarianism*, which will be published in January 2000. I have also drawn on a forthcoming paper by Chulhee Lee (2000) and on concepts developed jointly with Dora L. Costa, Irwin H. Rosenberg, Nevin Scrimshaw, and James M. Tanner. I have benefited from comments and criticisms by Karen L. Brobst, Katherine A. Chavigny, Dora L. Costa, Roderick Floud, Daniel M. Fogel, Enid M. Fogel, Allison M. Garrett, Mark Guglielmo, James A. Heckman, Max Henderson, D. Gale Johnson, Susan E. Jones, Chulhee Lee, Brigitte Madrian, Robert Mitterdorf, Douglass C. North, Nevin Scrimshaw, and Richard Suzman.

FIGURE 1. THE GROWTH OF THE WORLD POPULATION AND SOME MAJOR EVENTS IN THE HISTORY OF TECHNOLOGY

Notes: There is usually a lag between the invention of a process or a machine and its general application to production. "Beginning" means the earliest stage of this diffusion process.

Sources: Carl W. Bishop, 1936; T. K. Derry and T. I. William, 1960; Graham Clark, 1961; B. H. Slicher von Bath, 1963; Stuart Piggott, 1965; Glenn T. Trewartha, 1969; William McNeill, 1971; Jacob Bronowski, 1973; Carlo M. Cipolla, 1974; B. M. Fagan, 1977. See also E. A. Wrigley, 1987; Robert C. Allen, 1992, 1994.



Fiziskais

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# THE NEW YORKER



## kādi ir Latvijas izglītības ekosistēmas galvenie izaicinājumi un to novēršanas ceļi?

- ✓ Searching for: **Latvijas izglītības ekosistēmas galvenie izaicinājumi un to novēršanas ceļi**
- ✓ Generating answers for you...

Latvijas izglītības ekosistēmas galvenie izaicinājumi ir saistīti ar vienotu izpratni par kvalitatīvu izglītību, ko sagaidām no valsts izglītības sistēmas, bērnu atšķirīgajiem zināšanu līmeņiem, viņu sagatavotību mācībām, latviešu valodas zināšanām un prasmēm <sup>1</sup>.

Lai novērstu šos izaicinājumus, ir nepieciešams stiprināt skolotāju un skolēnu kompetences, uzlabot izglītības kvalitāti, nodrošināt pieejamību un vienlīdzīgas iespējas visiem skolēniem <sup>2 3</sup>.

Izglītības sistēmas attīstībai ir jābūt saistītai ar tautsaimniecības attīstību un valsts konkurētspējas veidošanu, labklājības un dzīves kvalitātes nodrošināšanu, demokrātiskas un pilsoniski aktīvas sabiedrības stiprināšanu, latviešu kultūrvēsturiskās identitātes, kultūras un latviešu valodas saglabāšanu <sup>3</sup>.

Lai sasniegtu šos mērķus, Latvijas izglītības sistēmas pamatnostādnēm 2021.–2027. gadam ir noteikts uzlabot izglītības kvalitāti, nodrošinot pieejamību un vienlīdzīgas iespējas visiem skolēniem. Tiek plānots ieviest jaunus mācību priekšmetus, uzlabot skolotāju darba apstākļus un palielināt viņu atalgojumu <sup>3</sup>.

Learn more: [1. lr1.lsm.lv](#) [2. unesco.lv](#) [3. likumi.lv](#) [4. enciklopedija.lv](#)

1 of 30 ●

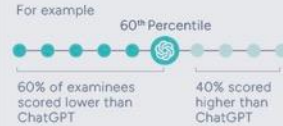




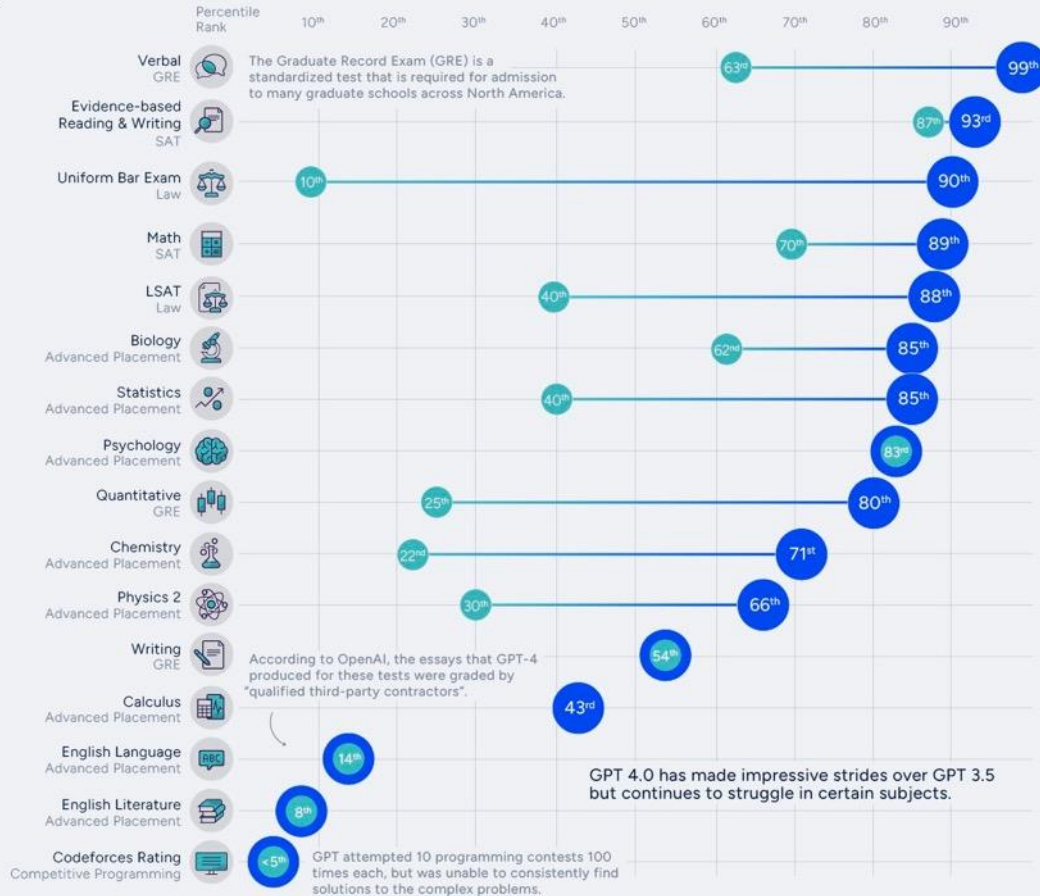
# How Smart is ChatGPT?

OpenAI's latest large language model, GPT-4, is capable of human-level performance in many professional and academic exams.

A percentile describes how an examinee's score ranks in comparison to others.



Exam Results ● ChatGPT 3.5 ● ChatGPT 4.0



COLLABORATORS RESEARCH + WRITING Marcus Lu | DESIGN Rosey Eason

Source: OpenAI (2023)  
Note: Percentiles are based on the most recently available score distributions for test takers of each exam type.

Facebook, YouTube, Twitter, Instagram, LinkedIn icons and handles: /visualcapitalist, @visualcap, visualcapitalist.com

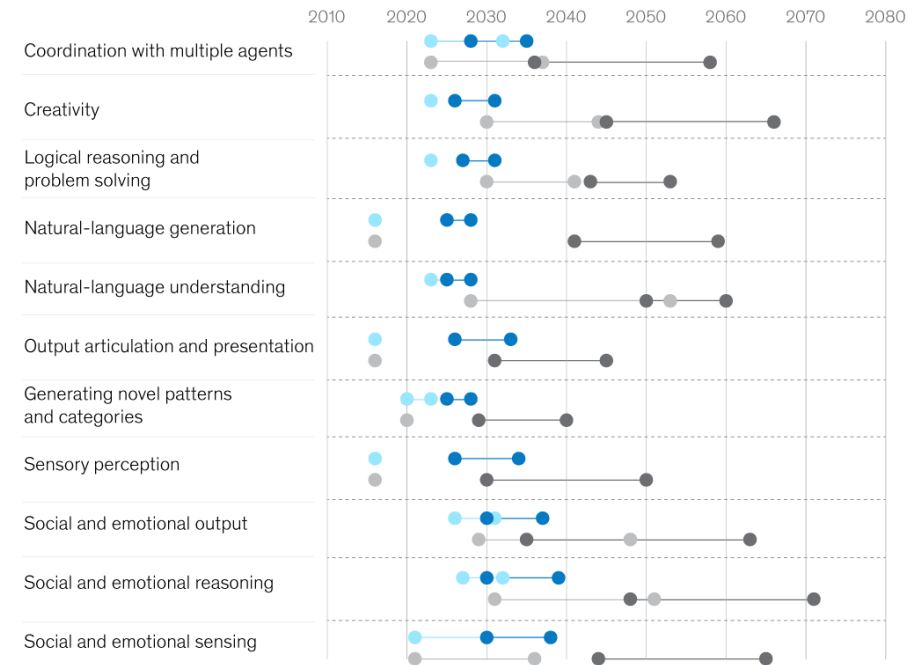
## As a result of generative AI, experts assess that technology could achieve human-level performance in some technical capabilities sooner than previously thought.

Technical capabilities, level of human performance achievable by technology

Estimates post-recent generative AI developments (2023)<sup>1</sup> ● Median ● Top quartile

Estimates pre-generative AI (2017)<sup>1</sup> ● Median ● Top quartile

○ Line represents range of expert estimates

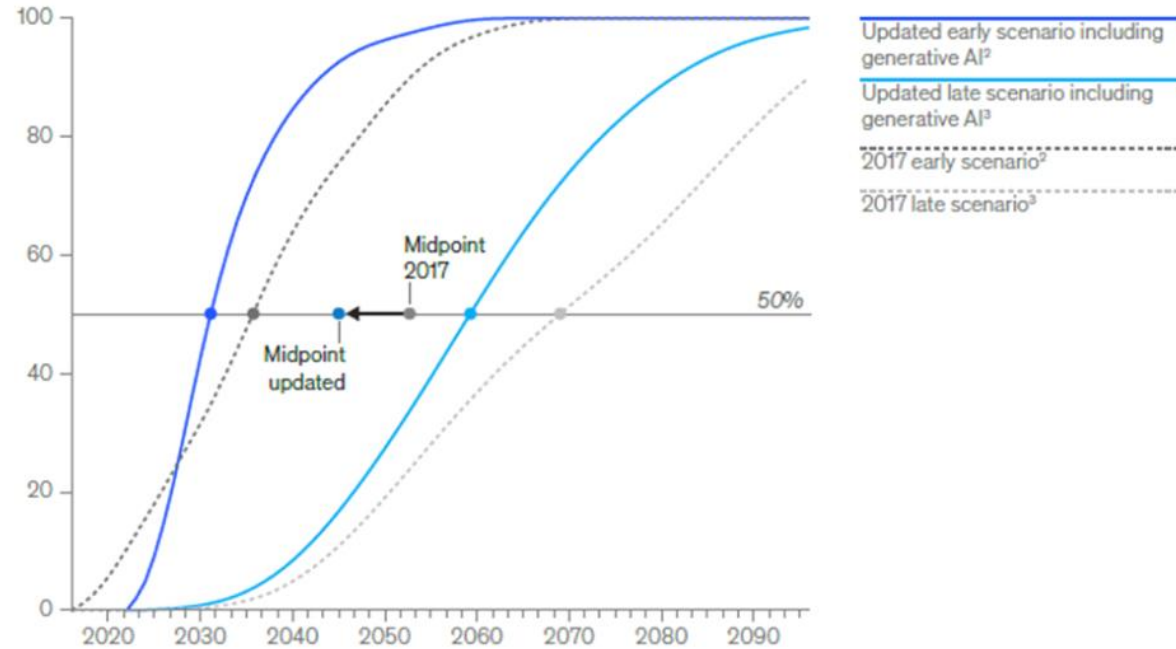


<sup>1</sup>Comparison made on the business-related tasks required from human workers. Please refer to technical appendix for detailed view of performance rating methodology.  
Source: McKinsey Global Institute occupation database; McKinsey analysis



## The midpoint scenario at which automation adoption could reach 50 percent of time spent on current work activities has accelerated by a decade.

Global automation of time spent on current work activities,<sup>1</sup> %



<sup>1</sup>Includes data from 47 countries, representing about 80% of employment across the world. 2017 estimates are based on the activity and occupation mix from 2016. Scenarios including generative AI are based on the 2021 activity and occupation mix.

<sup>2</sup>Early scenario: aggressive scenario for all key model parameters (technical automation potential, integration timelines, economic feasibility, and technology diffusion rates.)

<sup>3</sup>Late scenario: parameters are set for later adoption potential.

Source: McKinsey Global Institute analysis

# Izzudīs vai paliks?



	Darbs	Aizstātās iemaņas
1.	Datu ievades operators	Ātrums un precizitāte
2.	Klientu apkalpotājs	Komunikācija un empātija
3.	Korektors	Uzmanība detaļām
4.	Jurista palīgs	Izpēte un sakārtošana
5.	Grāmatvedis	Matemātiskās iemaņas
6.	Tulks	Valodas pārzināšana
7.	Tekstu radītājs	Radošums un rakstīšana
8.	Tirgus analītiķis	Analītiskās iemaņas
9.	Sociālo tīklu pārvaldnieks	Satura radīšana un pārraudzība
10.	Asistents	Laika pārvaldība
11.	Attālinātais pārdevējs	Pārliecināšana un komunikācija
12.	Personiskais asistents	Daudzuzdevumu pārvaldība
13.	Stenogrāfists	Klausīšanās un pierakstīšana
14.	Ziņu reportieris	Faktu pārbaude un rakstīšana
15.	Ceļojumu aģents	Plānošana un koordinēšana
16.	Apmācītājs	Zināšanas un mācīšana
17.	Tehniskā atbalsta speciālists	Problēmu diagnostika un atrisināšana
18.	Mārketinga speciālists	Klientu atlase un rakstīšana
19.	Satura moderators	Kritiskā domāšana un lēmumu pieņemšana
20.	Personāla speciālists	Intervēšana un izvērtēšana

	Darbs	Grūti aizstājamās iemaņas
1.	Terapeits	Empātija un cilvēciskā saikne
2.	Sociālais darbinieks	Kompleksas sociālās un emocionālās pieredzes
3.	<b>Mazu bērnu skolotājs</b>	Cilvēciskā saziņa kognitīvai attīstībai
4.	Medmāsa	Cilvēciska empātija un adaptēšanās
5.	Mākslinieki	Radošums, emocijas, unikalitāte
6.	Rakstnieki	Cilvēciskās pieredzes nianse
7.	Šēfpavāri	Garšu sarežģītība, pasniegšana
8.	Frizieri	Personiskais stils, radošums
9.	<b>Personiskie treneri</b>	Motivācija, individuālās vajadzības
10.	Pasākumu plānotāji	Radošums, problēmu risināšana
11.	Celtnieki	Problēmu risināšana objektā, piemērošanās
12.	Nodarbinātības treneris	Dziļa psiholoģijas izpratne
13.	Arheologs	Vēsturiskais konteksts, kultūras nianse
14.	Jūras biologs	Ekoloģijas izpratne, piemērošanās
15.	Ētikas eksperts	Morālā domāšana, kultūras izpratne
16.	Diplomāts	Cilvēku novērtēšana, kultūras izpratne
17.	Garīdznieks	Garīgā vadība
18.	Elektriķis	Problēmu risināšana, piemērošanās unikālajam
19.	Santehniķis	Problēmu risināšana, mehāniskās iemaņas
20.	Mazā biznesa īpašnieks	Radošums, inovācijas, riska uzņemšanās



# Kas pilnīgi no jauna?



 **Alvin Foo**  @alvinfoo · Jun 7  
Jobs of the future... our kids will be taking up one of these roles 🤖

### Jobs of the future 2025-2050

 <b>3D-printed food engineer</b>	 <b>Extinct species revivalist</b>
 <b>AI engineer</b>	 <b>Commercial space pilot</b>
 <b>Mind-transfer specialist</b>	 <b>Organ or body part creator</b>



Future of Jobs

## Reskilling needs

44%

of workers' core skills  
are expected to change  
in the next five years

Source: World Economic Forum,  
*Future of Jobs Report 2023.*

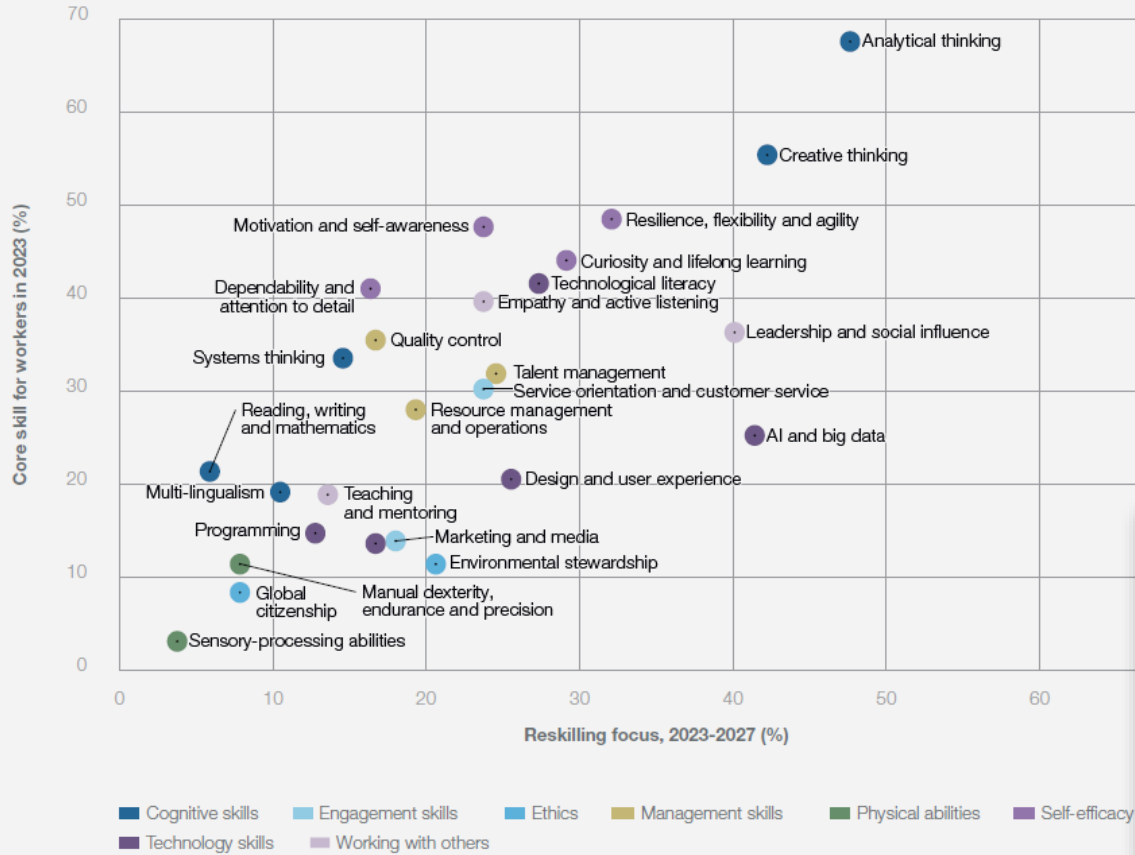


Nākamo  
5 gadu  
laikā!!!

FIGURE 4.6

### The evolving skills landscape, 2023-2027

The probability of an organization surveyed evaluating a skill to be a core skill for its workers in 2023 versus the probability of the skill appearing in its reskilling and upskilling initiative in the next five years



Source  
World Economic Forum, Future of Jobs Survey 2023.

Note  
The Future of Jobs Survey uses the World Economic Forum's Global Skills Taxonomy.

### Top 10 skills of 2023



- Analytical thinking
- Creative thinking
- Resilience, flexibility and agility
- Motivation and self-awareness
- Curiosity and lifelong learning
- Technological literacy
- Dependability and attention to detail
- Empathy and active listening
- Leadership and social influence
- Quality control

Type of skill  
 Cognitive skills   Self-efficacy   Engagement skills   Management skills   Technology skills   Working with others

Source  
World Economic Forum, Future of Jobs Report 2023.

Note  
The skills judged to be of greatest importance to workers at the time of the survey







# Ko izvēlēties?

Dr. Bērziņš

+

Mākslīgais  
intelekts



# Paplašinātais intelekts



**The Economist** @TheEconomist · 15h

Apple's message is clear: after desktop and mobile computing, the next big tech era will be spatial computing—also known as augmented reality



economist.com

Apple's Vision Pro is an incredible machine. Now to find out what it is ...  
The meaning of "spatial computing"



**Eric Feigl-Ding** @DrEricDing · May 26

Whoa.... FDA has just approved the first human trial of computer-to-human Neuralink interface. Ready or not... the augmented human vs AI race just got realz yo. God help us. Would you enroll as the first guinea pig 🐷?



|| GIF ALT

**Neuralink** @neuralink · May 26

We are excited to share that we have received the FDA's approval to launch our first-in-human clinical study!

This is the result of incredible work by the Neuralink team in close collaboration with the FDA and represents an important first step tha...

**Sadarbībā balstīta izglītība**

$$2 + 2 > 4$$

# Paldies!

Kontakti:

