ATLAS
OF NEW
PROFESSIONS
AND COMPETENCIES
OF KAZAKHSTAN

Atlas of New Professions and Competencies

Skills Technology Foresight –
universal toolkit for emerging skills and competencies

2021

BTS·Education

ERG

Skills and Jobs Project for Kazakhstan

THE WORLD BANK
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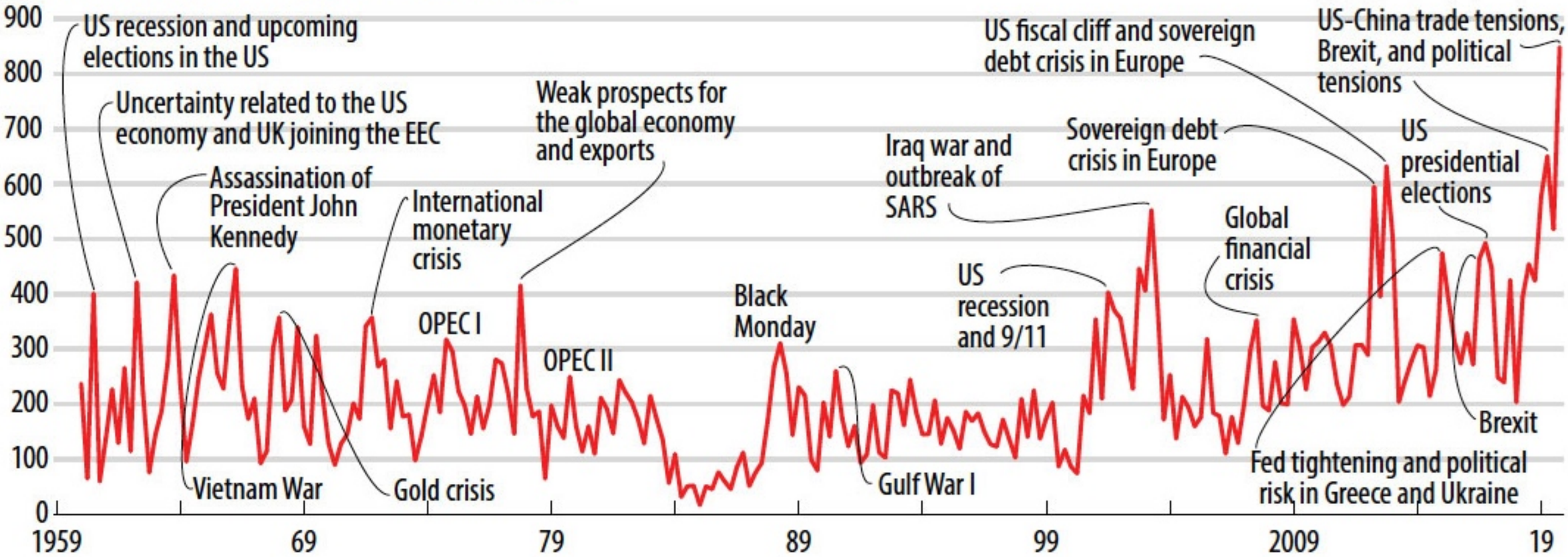
Uncertain times

Global uncertainty has surged to a record high.

(WUI index: 1959 Q1 to 2019 Q4, GDP weighted average)



Sources: Ahir, H., N. Bloom and D. Furceri (2018), World Uncertainty Index (WUI), mimeo.

Note: The WUI is computed by counting the frequency of the word "uncertain" (or the variant) in Economist Intelligence Unit country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa. The aggregate and disaggregate data by country and regions are available at www.worlduncertaintyindex.com.

The impact of global challenges on the labor market are of interest to many governments and international organizations

WORLD ECONOMIC FORUM

"Overall, the outlook for employment in most sectors is moderately positive, with growth expected in a number of sectors."

WORLD BANK GROUP

"The challenge to society is not technological change per se, but the risk that some people - especially those in the lowest 40 percent - may incur a disproportionate share of the costs associated with any given change."

International Labour Organization

"Increased inequality, insecurity, instability and informality questioned the very foundations of the social contract at the beginning of the 21st century "

The Economist

"In the past, technological innovation has always provided more, not less, employment in the long run. But that could change."

Source: WEF (Future of Jobs report, Jan 2016); The World Bank; The International Labour Organization; The Economist

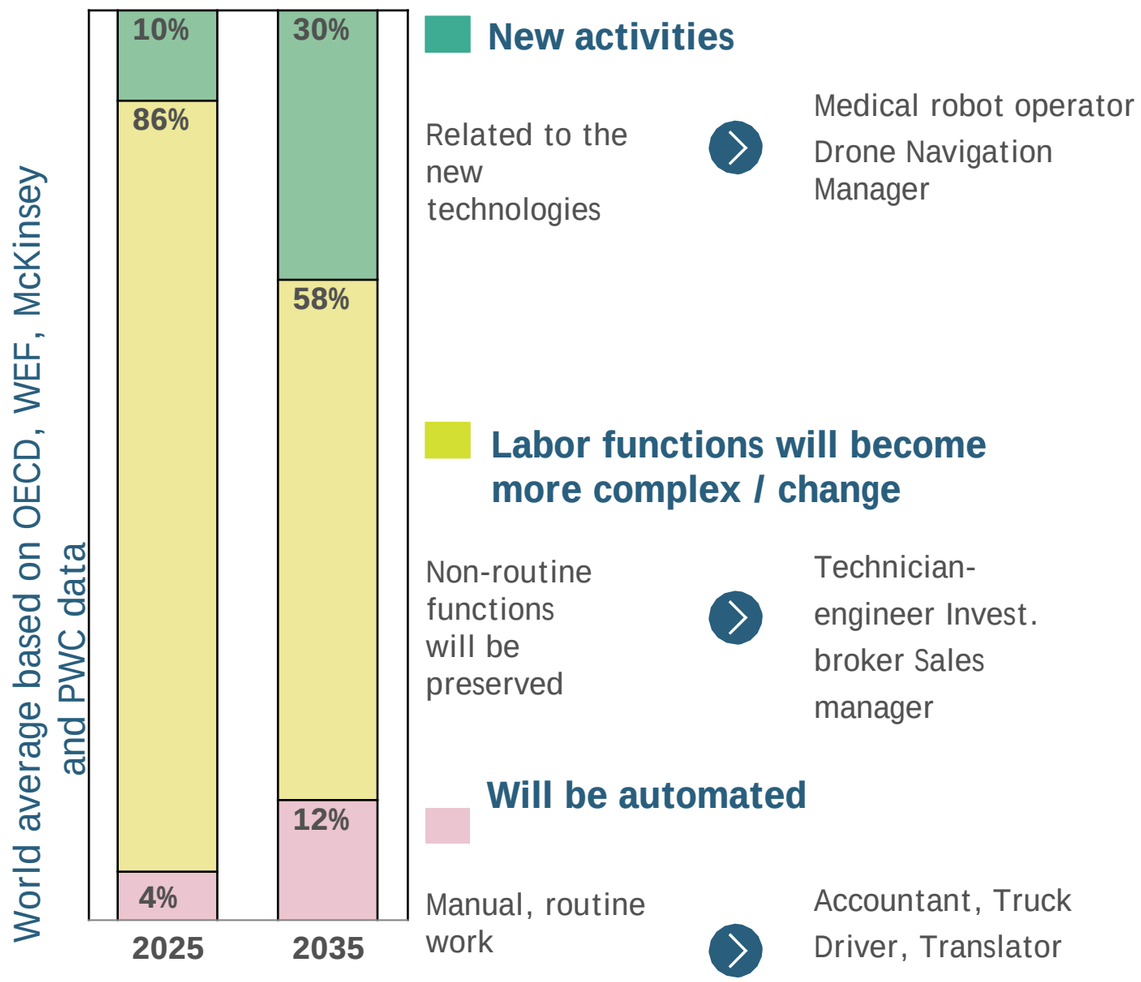
Labor markets are undergoing drastic changes: six global megatrends will exacerbate supply and demand imbalances

Changes factor	Megatrends	General challenges
Shifts in technology and digital productivity	**Digitalization, Automation and technological innovation** Big data and in-depth analytics	• By 2035 - automation of 1/3 of work, which will significantly affect 3/4 of jobs • Risk of lack of skills in occupations less affected by automation • Weakening the relationship between wages and productivity
Shifts in resource allocation	New demographic composition Displacement of geopolitical and economic forces	• The working population spans several generations due to an aging population and the influx of Generation Z • The growing involvement of women in labor, but mostly in low-paid professions • Regional imbalances and the "war for talent"
Shifts in the values and culture of the working population	Manifold and inclusiveness New business models	• Inclusiveness can be a major source of job creation • Changing requirements for working conditions • The importance of flexible forms of employment is growing, and a person may have multiple flexible jobs

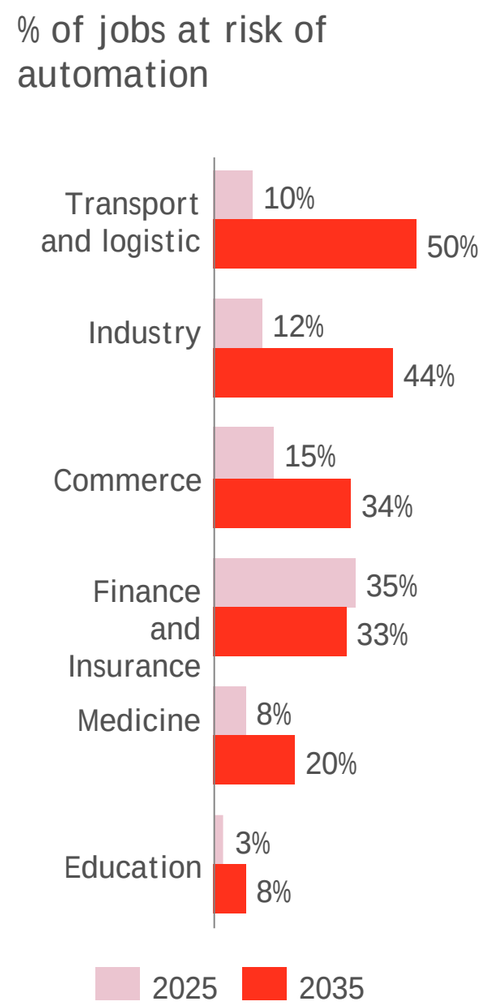
Global challenge 1

Technology development and digitalization

Digitization will have an impact to jobs …



… in all industries



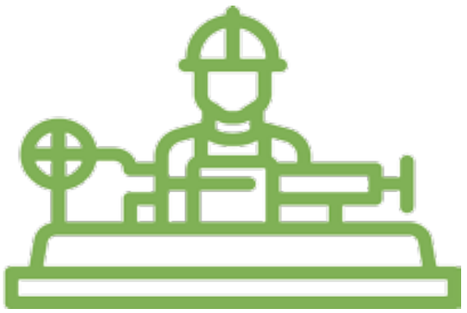
Source: World Economic Forum; Will robot really steal our jobs? An international analysis of the potential long term impact of automation, PWC (2018); Arntz, M., T. Gregory and U. Zierahn (2016), The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis, OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris; A Future That Works, McKinsey Global Institute

New

Skills and competencies for the new economy

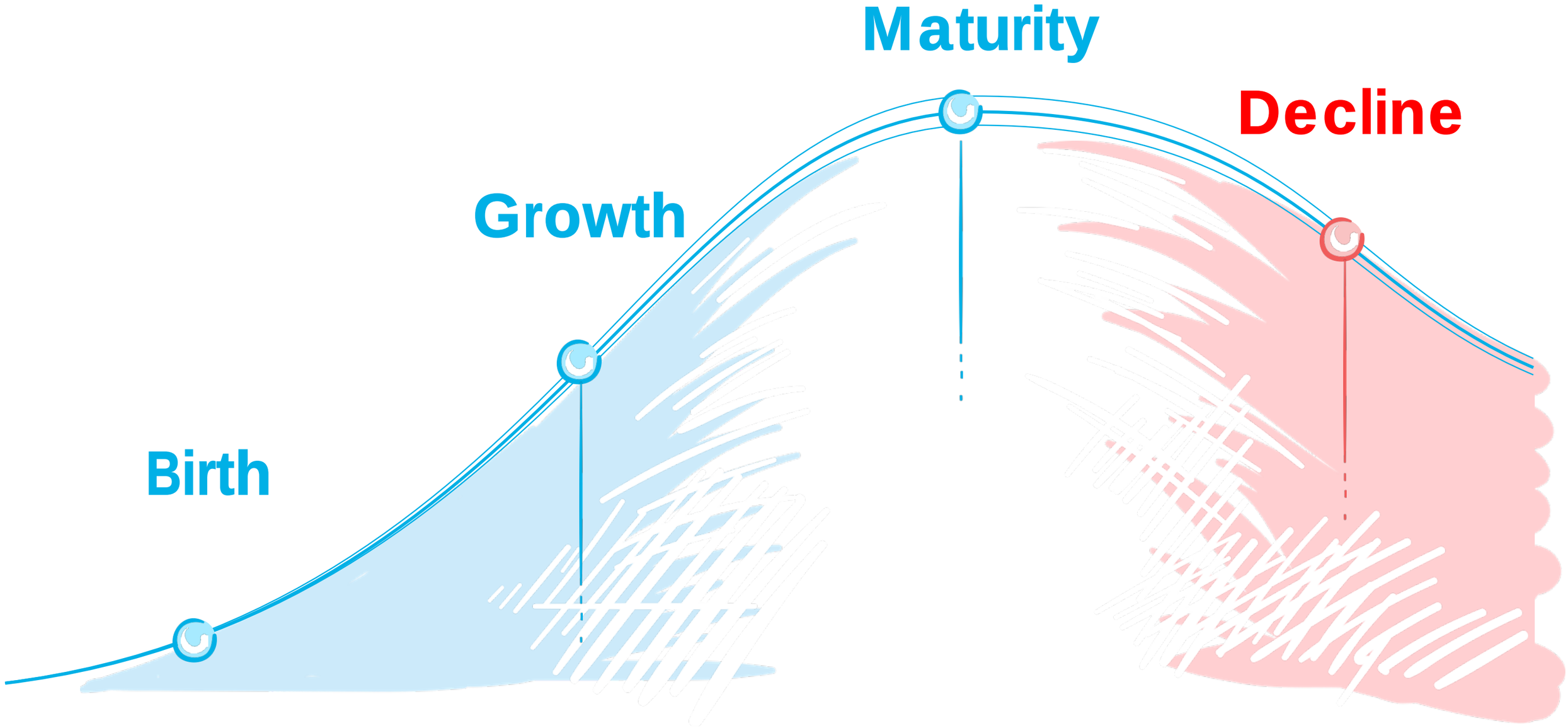
Transforming

Changing under the pressure of technology



Disappearing

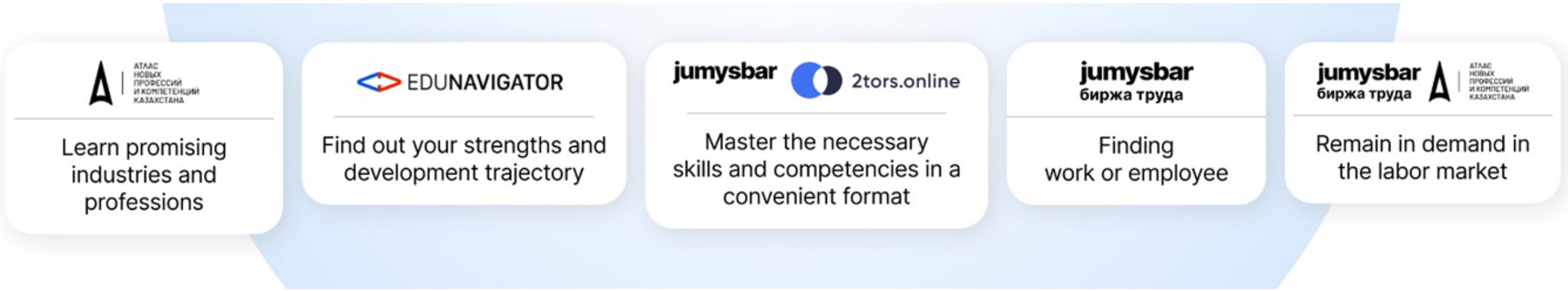
"Extra people"


Maturity
Decline
Growth
Birth

CREATING A COMPLEX MODEL

labor market forecasting, training, knowledge assessment, qualifications and data collection

- ✓ labor market forecast for the next 5-10 years
- ✓ complex professional diagnostics, vocational guidance, knowledge assessment
- ✓ creation of retraining and training programs for new skills and competencies
- ✓ ensuring productive employment of the labor force



1) Какими навыками обладает население
2) Кем могут стать наши дети
3) По какой специальности можно переобучить население

Атлас новых профессий
- Перечень новых профессий и компетенций до 2035г
- Прогнозы развития отраслей экономики

EDUNAVIGATOR
- Узнать свои сильные стороны
- Скоринг
- ✓ Определиться с профессией
- ✓ Выбрать университет

Выбор профессии

1) Квалификация педагогов Казахстана
2) Какие курсы эффективней обучать live

2tors.online
- Найти онлайн репетитора
- Подготовиться к местым и зарубежным экзаменам
- Стать онлайн репетитором
- Повышение квалификации учителей

Live Обучение

1) Какие навыки легче и быстрее освоить online
2) Как лучше всего обучать

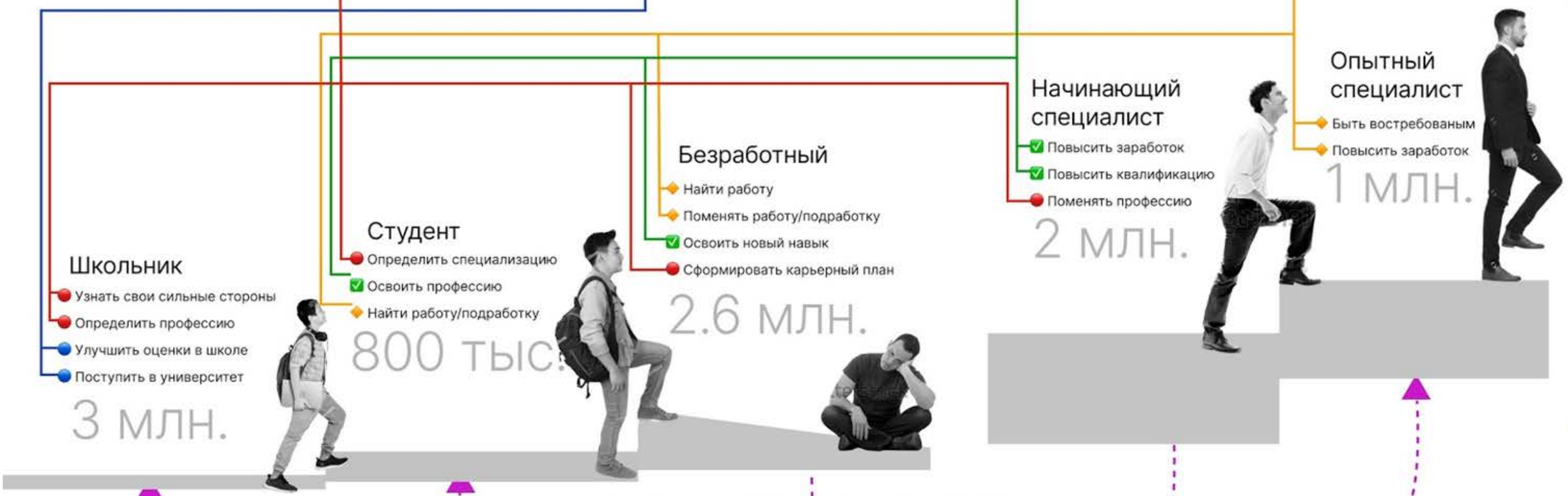
jumysbar курсы
- Освоить профессию (онлайн-курсы)
- Найти работу/подработку
- Получить единую анкету-резюме
- Проконсультироваться с экспертом

Online Обучение

1) Дефицит каких специалистов будет
2) Достаточно ли новых рабочих мест появляется
3) Какие специалисты нужны рынку

jumysbar биржа труда
- Найти сотрудников
- Повысить квалиф. сотрудников

Трудоустройство



Индивидуализированные рекомендации на основе данных

aitu.apps

Данные из экосистемы Aitu

Data Lake (DMP)

Данные о талантах, уровне знаний, квалификации, трудоспособности нашего населения

‘It is no longer sufficient to train workers to meet their specific current needs; we should ensure access to training programmes that support lifelong skills development and focus on future market needs.’

International Labour Organization

The G20 Pittsburgh Summit Leaders’ Statement

In June 2010 at the G20 Summit in Toronto, the International Labour Organization (ILO) presented the G20 Training Strategy: A Skilled Workforce for Strong, Sustainable and Balanced Growth.

The G20 Training Strategy’s focus on skills anticipation for future market opportunities is understood in the context of the global driver of change - innovation and technological change.

In the framework of the project, applying the G20 Training Strategy, the ILO developed the Skills Technology Foresight approach. This is a new toolkit for skills needs anticipation based on the best international practices and foresight approaches that will steer experts and practitioners in defining future technological change and related changes in work organization, job tasks and skills needs.

Skills Technology Foresight (STF) Methodology

In June 2010, at the G20 Leaders Summit in Toronto

International Labor Organization (ILO)

Presented the Strategy in the field of professional training "Qualified workforce - the basis of intensive, sustainable and balanced economic growth"

The strategy was based on the “Recommendations on the professional skills necessary to increase productivity, employment growth and economic development” accepted at the International Labor Conference in June 2008, and the ILO’s own findings

International Labour Organization

АГЕНТСТВО СТРАТЕГИЧЕСКИХ ИНИЦИАТИВ

SKOLKOVO Moscow School of Management

АТЛАС НОВЫХ ПРОФЕССИЙ

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STF methodology

Within the framework of the project “Application of the G20 Strategy in the Field of Professional Training”, the ILO and the SKOLKOVO Moscow School of Management have developed the Skills Technology Foresight method

Atlas of New Professions

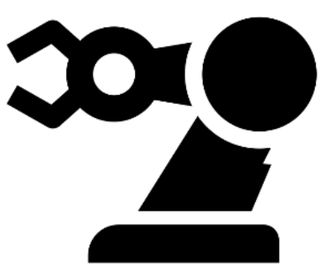
In 2019, based on this methodology, the Atlas of New Professions project was developed in Kazakhstan where STF was upgraded

World experience

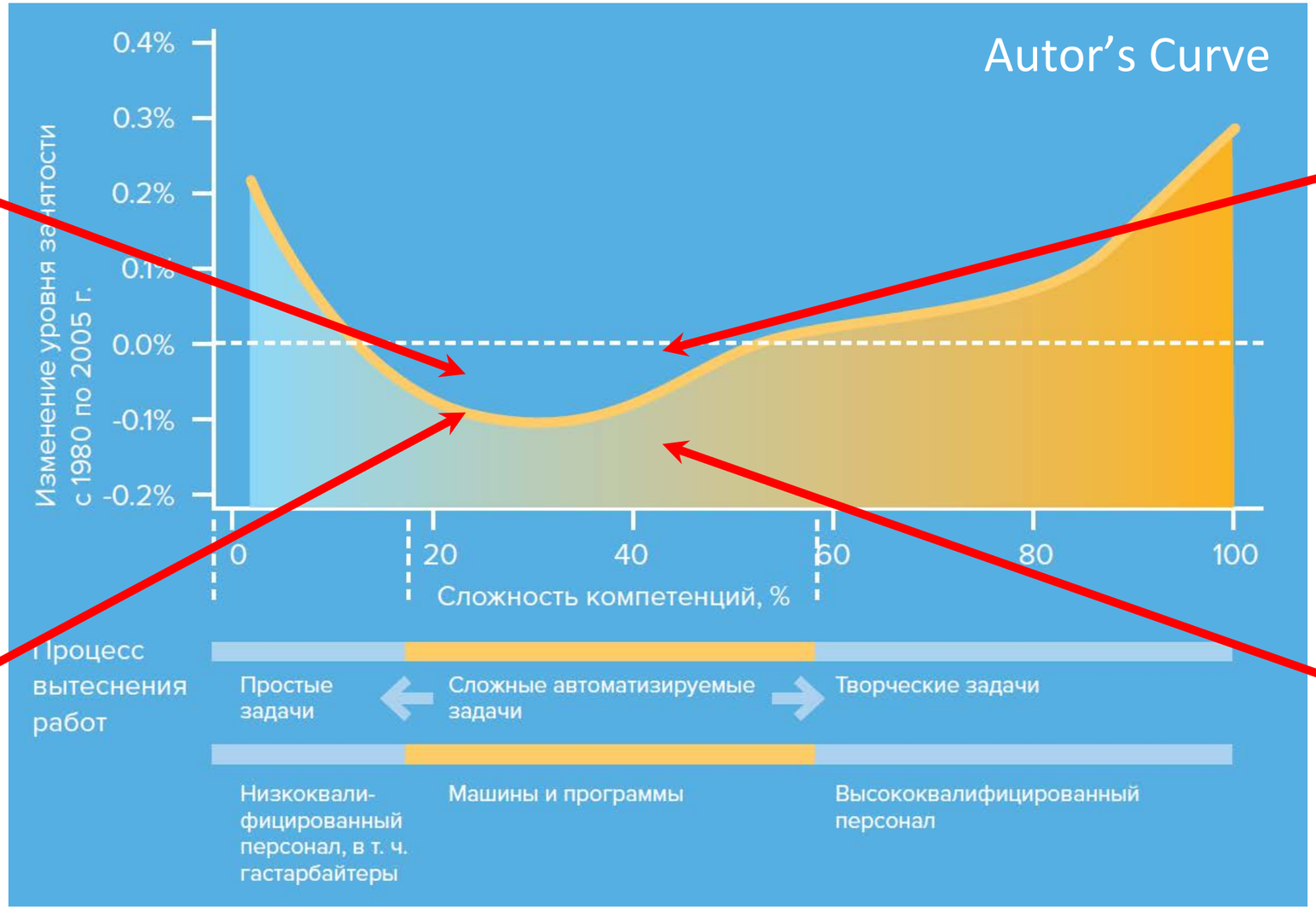
In 2014, two pilot projects were implemented - in Armenia and Vietnam in separate sectors of the economy (food industry, information and communication technologies, precision engineering and metalworking industry).
In 2015, STF became the core of the Tanzania National Skills Development Strategy project. In 2016, STF was used in a projection of personnel requirements in Tunisia and South Africa

Impact of global and local trends on the labor market

Digitalization



Automation



Globalization

Greening

Technological foresight of the Donskoy MPP competencies

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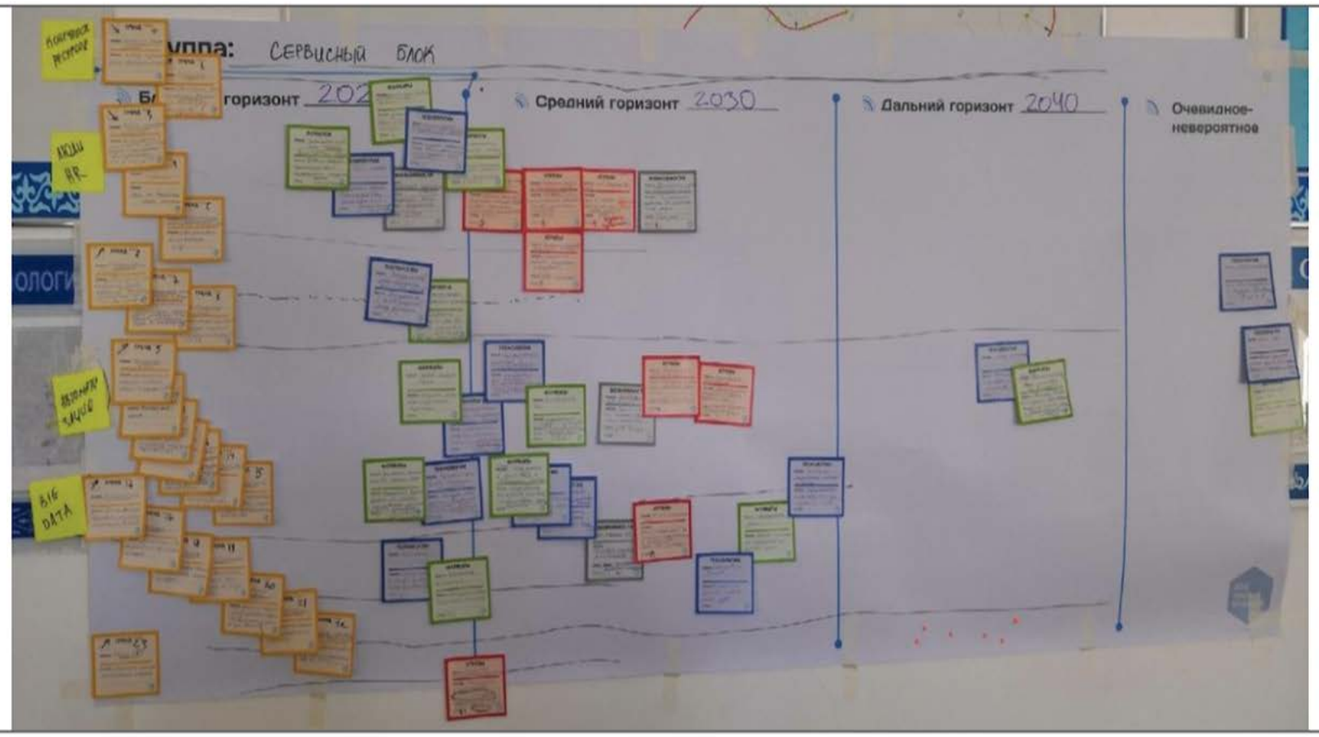
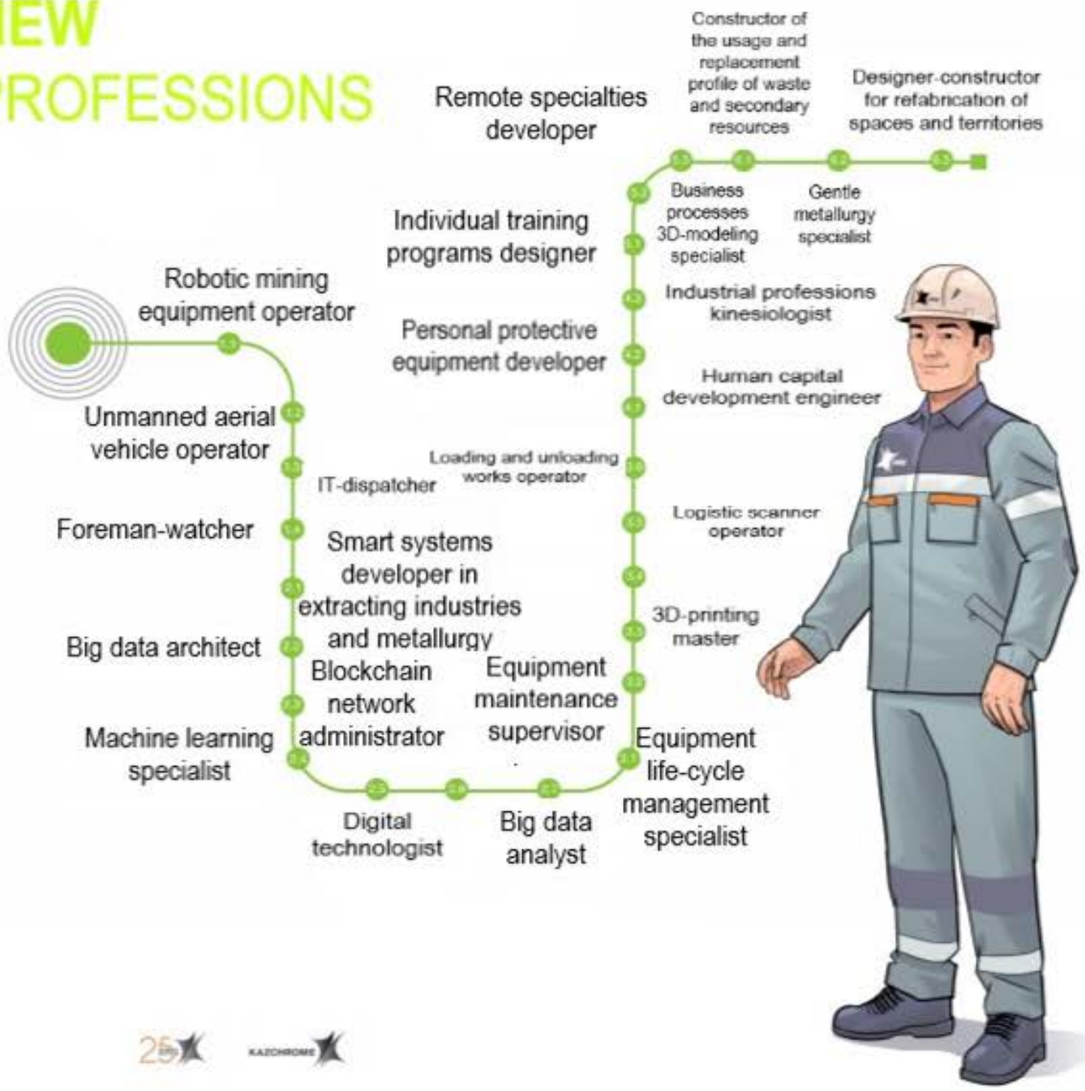


Рис.1 Карта будущего одной из групп.

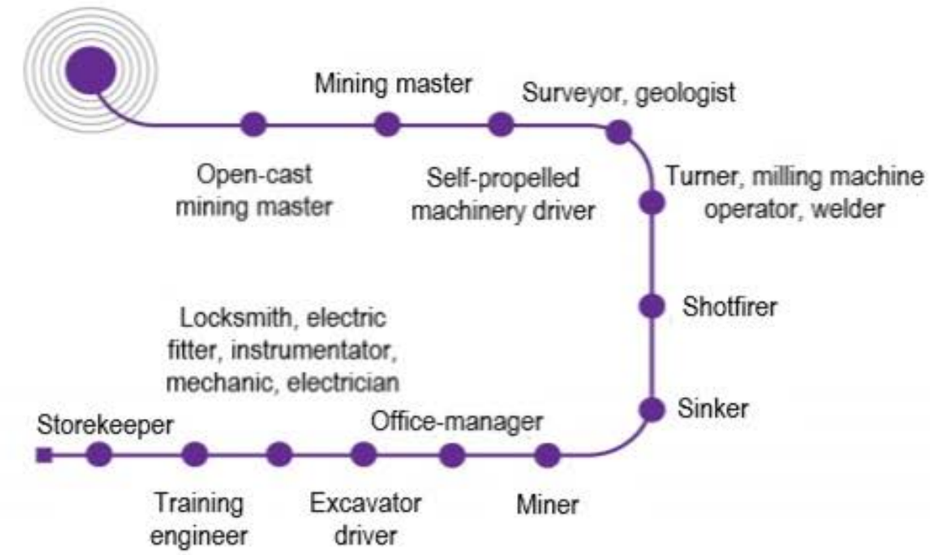
Atlas of professions of Donskoy MPP

PROFESSIONS MAP

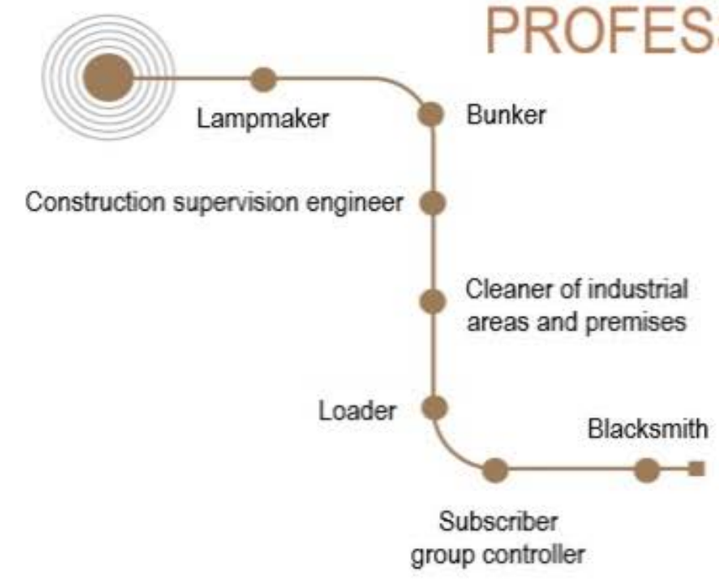
NEW PROFESSIONS



CHANGING PROFESSIONS



DISAPPEARING PROFESSIONS



Decree of the President of the Republic of Kazakhstan No. 27 dated June 20, 2019

Action Plan

on the implementation of the election program
President of the Republic of Kazakhstan
“Well-being for everyone! Continuity. Justice.
Progress "and proposals received during the national action" Birge "

Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan

Ministry of Education and Science of the Republic of Kazakhstan

ATLAS OF NEW PROFESSIONS AND COMPETENCIES OF KAZAKHSTAN

QAZAQSTANNYŃ JAŃA MAMANDYQTAR MEN QUZYRETTER ATLASY

АТЛАС НОВЫХ ПРОФЕССИЙ И КОМПЕТЕНЦИЙ КАЗАХСТАНА

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Item 39

Development of the Atlas of new professions and competencies in demand in the labor market

Order of theMinistry of Labor and Social Protection of the Population of the Republic of Kazakhstan

akims Nur-Sultan, Almaty,
Shymkent and regions,
Industry Associations, Industry Unions,
NPP "Atameken" (as agreed)

Atlas is being implemented in 9 priority sectors of the economy

Development of the Atlas of new professions and competencies in demand in the job market

Action plan for the implementation of the pre-ele
programs of the President of the Republic of Kazal
Tokayev K.K

АТЛАС НОВЫХ ПРОФЕССИЙ И КОМПЕТЕНЦИЙ КАЗАХСТАНА

9 priority sectors of the economy

- Mining and metallurgical industry
- Oil production and processing
- Agriculture
- Transport and logistic
- IT-technologies
- Mechanical engineering and metals
- Tourism
- Energy
- Construction and building materials

Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan

BTS·Education

Pilot project - Atlas of new professions
DGOK ERG
May-July 2019

On October 31, 2019, a Memorandum of Cooperation was signed

2019

February 2020
Stage I - Analytics, Foresight sessions, working with experts, Development of regulatory and legal recommendations

September 2020
Stage II - Development of a website, mobile application, industry atlases

Key product metrics

94 IN-DEPTH INTERVIEWS

1298 INDUSTRY FORECASTS BY EXPERTS

916 PARTICIPANT OF INDUSTRIAL FORESIGHT SESSIONS

463 PROFESSIONS based on the results of nine industry foresight sessions

239 NEW PROFESSIONS

95 TRANSFORMING PROFESSIONS

129 DISAPPEARING PROFESSIONS

Project start: February 3, 2020
End of the project: September 10, 2020

Atlas — the instrument designed to develop and activate self-sufficiency skills among socially vulnerable groups

Right choice of profession – is a key factor of social stability, affecting an individual's standards of living, his education level and creative development

Atlas of New Professions

01 **Constructor – new skills and competencies**, that should **be mastered by the current workforce**

02 **Instrument – vocational orientation** for parents, teachers, students and people, who search for new development horizons

03 **Accessible, simple and applied –** instrument for advancing training and choosing a profession

04 **Assistant –** to candidates in **search or rethinking** of professional activity

05 **Navigator** - in the development prospects of **new** professions, **transforming** professions, **not-in-demand** professions

Choose school

Choose specialty

Career solutions

Professional literacy and skills

1. National (Government) Level

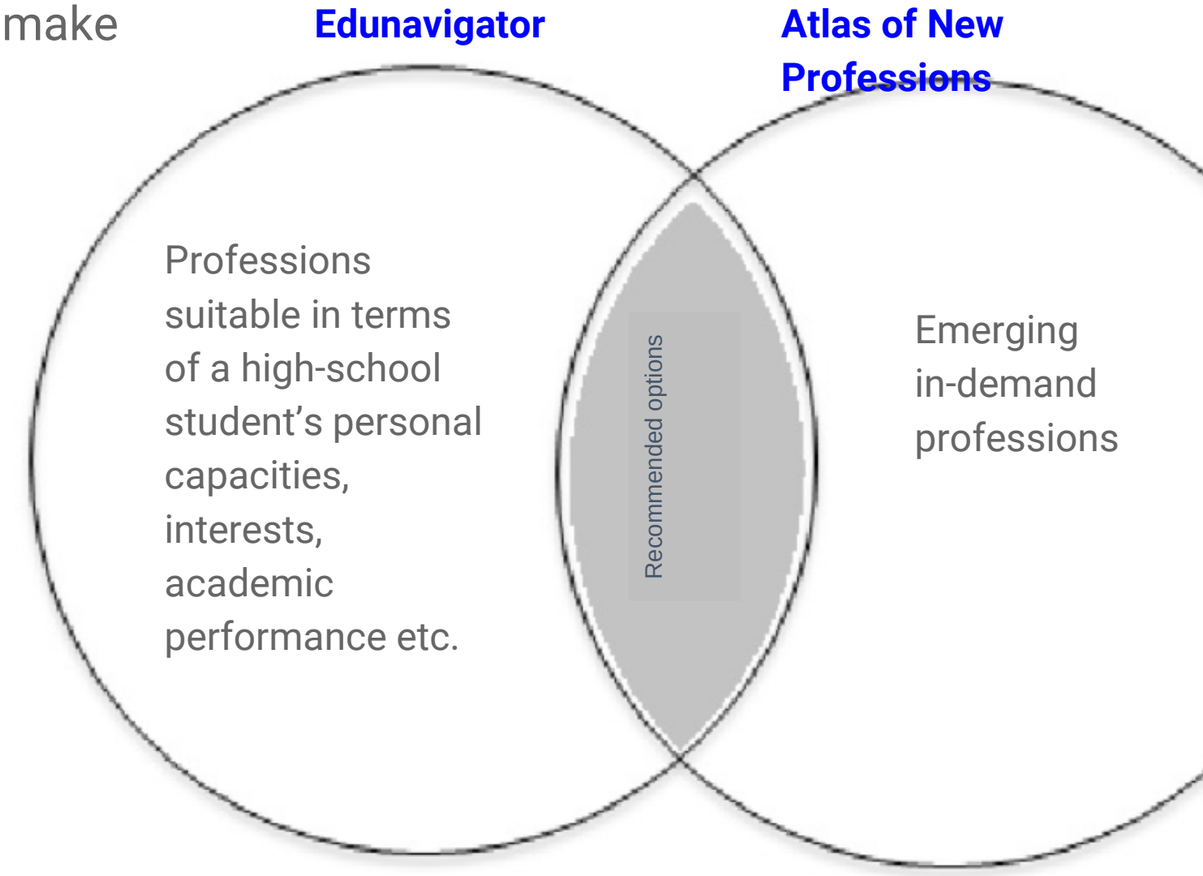
1.1 Build a massive career guidance tool for schools (case of Kazakhstan)

KZ Ministry of Education and Science – integrate Atlas findings into career guidance activities in schools and VET institutions

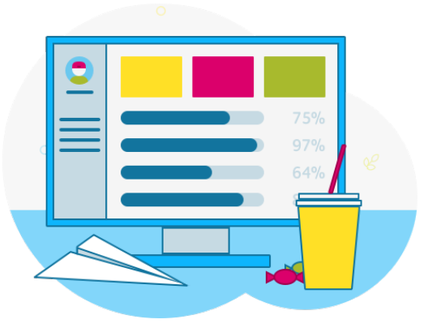
Atlas is a massive, simple and easy-to-use career guidance tool provides information about current state and developments prospects of the labour market in Kazakhstan, in-demand professions and skills in the local market. It is designed to help high-schoolers and university applicants, their parents to make an informed choice of the future profession. The list c professions (presently 200+) has been integrated into a guidance platform edunavigator.kz.

Thus, integration of the Atlas and Edunavigator will l elaborate a comprehensive and balanced career gu system with regard to labour market prospects, on the one and a high-schooler's capacities, aptitudes, interests etc.

As per the KZ Ministry of Labour order dated March 13 №90, **Atlas findings can also be used as part of a social guidance of unemployed people or other disadvantaged g of population**, exercised by the Population Employment Ce



Career guidance platform EduNavigator



Students

- Discover Yourself
- Find out your strengths and individual development trajectory
- Choose and study promising areas of activity

Parents

- Receive recommendations for specific professions and continuing education programs
- Build a personal trajectory of development

Teachers and directors

- Learn about the educational needs of students
- Introduce schoolchildren to the education market and professions

1.2 Atlas as a tool to improve labor market forecasting and resilience, and reduce skills mismatch

National classifications of occupations and International Standard Classification of Occupations (ISCO-08), National Qualifications Systems

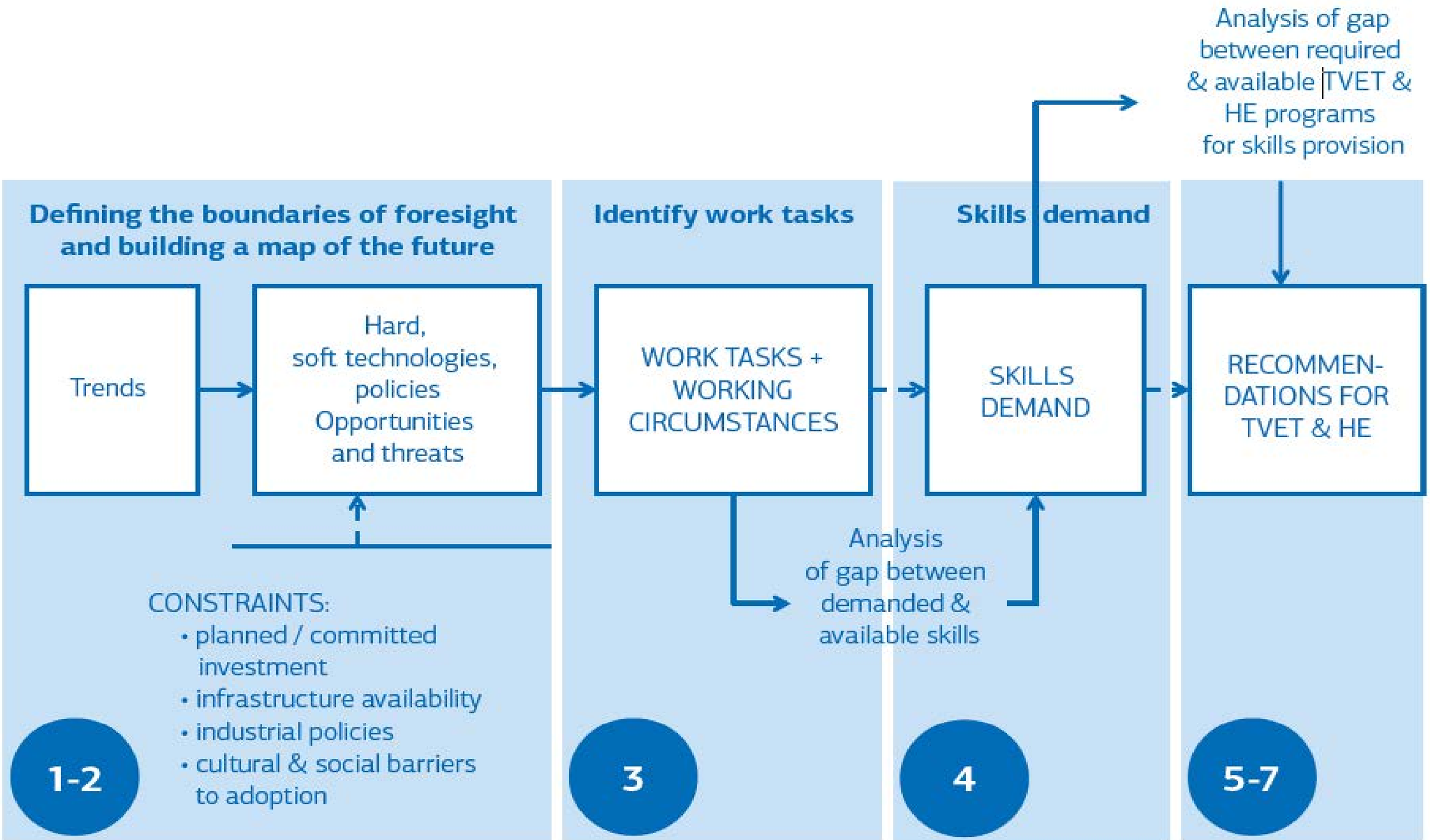
Many countries have used one or more versions of ISCO as the **model for their own national classifications**, and others have retained or developed their own national structures. Some **regional classifications** have also been developed on the basis of ISCO. Many countries which have adopted ISCO as a model have defined the structure of their national classifications in terms of a set of occupational titles and alternative titles but have not necessarily developed a set of associated definitional descriptions.

A number of countries are **currently adapting their national classification** to allow comparability with ISCO-08, or are **developing or updating national classifications based on ISCO-08**

Hence, the Atlas can help countries in cleaning and refining National Classifications of Occupations, i.e. remove the outdated occupation titles, and introduce new or changing ones.

It can also be used to update elements of the National Qualifications System, such as occupational standards, sectoral qualifications frameworks etc.

1.3 Atlas as a tool to update higher, vocational education curricula, professional (re)training and upskilling programs



Перечень применимости летательного аппарата

Подразделение	Перечень по проекту «Атлас новых профессии» «оператор беспилотных летательных аппаратов »
Главный обогатитель	1. Применить данное оборудование для обследования и осмотра ГТС, шламопроводов и контроля за работой подрядных организаций обогатительных фабрик (перевозка руды, порядок складирования, соблюдение маршрута передвижения).
Главный маркшейдер	1. Для повышения уровня безопасности маркшейдеров за счет дистанционного осуществления съемки в труднодоступных местах и местах, трудовая деятельность в которых, связана с повышенным риском. 2. Для наблюдениями за движениями дневной поверхности, деформациями зданий и сооружений (шламохранилищ); 3. Для мониторинга за горным массивом (обследование бортов карьеров и отвалов); 4. По построенным моделям возможность производить измерения расстояний, определять координаты, уклоны, периметры, площади и объемы.
Менеджер по обеспечению производства Управление по обеспечению производства	Считаем целесообразным применение беспилотных ЛА для осуществления контроля за эксплуатацией спец. и автотранспорта с целью выявления фактов не эффективного использования указанной техники.
ОГЭ	можно производить верховой осмотр анкерных опор, промежуточные опоры, узлы крепления поводов, шлейфов и мест касания провода без применения автовышек и без производства отключения воздушных линий. производиться мастером ЛКХ либо НУСиП, после каждых авариных отключениях с посадкой напряжения и периодический раз в квартал. ЭлЦ
	С помощью беспилотного аппарата можно проводить осмотр дымовой трубы, а именно устье дымовой трубы. Периодичность проверки 2 раза в год в период весеннего и осеннего осмотра ЗиС. Также возможно проводить осмотр водохранилищ, шламохранилищ Донского ГОКа во время и перед паводковым периодом. Необходимо обучить специалиста ОКСа для осмотра дымовой трубы, а также специалсита энергоцеха для осмотра водохранилищ ЭнЦ

3-stage faculty development program

1) Theory and introduction

2. Familiarization with equipment and software


REDMI
AI QUA


REDMI NOTE 9
AI QUAD CAMERA


DGOK

«Согласовано»	«Согласовано»	«Утверждено»
Руководитель УО Актюбинской области	Директор ДГОКа	Директор ХГТВК
_____ Батырхан Ж.Н.	_____ Бектыбаев А. А.	_____ Мулдашева Б.К.
«20» 04 2021 г.	«19» 04 2021 г.	«20» 04 2021 г.

Экспериментальный рабочий учебный план
технического и профессионального образования
ГККП «Хромтауский горно-технический высший колледж»
ГУ «Управление образования Актюбинской области»

Код и профиль образования: 0716 Автотранспортные средства, морские и воздушные суда
Специальность: 07161100 Дистанционно пилотируемая авиационная система (по отраслям)
Квалификация: 3W07161101 Оператор беспилотных летательных аппаратов

Форма обучения: краткосрочная
Нормативный срок обучения: 3 мес.
на базе общего среднего образования

Universities and the Atlas

ATYRAU OIL AND GAS UNIVERSITY

Atyrau Oil and Gas University - The university included the Atlas into their 2020-2025 strategy, currently they are going to introduce 16 professions from the Atlas. By 2021 Atyrau Oil and Gas University will implement 25 profession for BA degree

EURASIAN NATIONAL UNIVERSITY

Eurasian National University included 4 subjects for ”Information security systems” Masters program

Al-Farabi Kazakh National University is opening a new Masters program “Information security audit” along with subjects based on Atlas

INTERNATIONAL UNIVERSITY

International IT University Including multiple subjects for varied BA and MSc degrees

SATBAYEV UNIVERSITY

Satbayev university is including 2 subjects for Masters degree

АУЭС

Образован в 1975

Almaty University of Power Engineering and Telecommunications is planning to include quantum cryptologist subject

ASTANA IT UNIVERSITY

Astana IT University included 12 subjects to ”Cybersecurity” program

Karaganda Industrial University designed a new program ”Ecoanalyst”

2. Industry level

Atlas of Emerging Jobs in Metallurgy Industry

POSSIBLE FUTURE CHALLENGES:

- Development and management of automated production lines
- Mobile production management
- Design of alloys with preset parameters
- Environmental compliance control
- Metal product cycle management

CROSS-PROFESSIONAL SKILLS

- Systems thinking
- Intersectoral communication
- Project management
- Programming / Robotics / Artificial Intelligence
- Client focus
- Multilingual and multicultural abilities
- Interpersonal skills
- Ability to work under uncertainty
- Lean production
- Artistic skills
- Environmental thinking

EQUIPMENT SUPERVISOR

Specialist with competences in mechatronics and engineering, operating and servicing high-tech equipment throughout its life cycle.

CROSS-PROFESSIONAL SKILLS

job to emerge before 2020 — before 2020

ECORECYCLER IN METALLURGY

Professional tasked with metallurgic waste disposal and environment rehabilitation.

CROSS-PROFESSIONAL SKILLS

job to emerge before 2020 — before 2020

ADVANCED METALS ENGINEER

Specialist engaged in designing alloys with preset or variable properties (changing based on operating conditions).

CROSS-PROFESSIONAL SKILLS

job to emerge after 2020 — after 2020

EQUIPMENT DESIGNER IN POWDER METALLURGY

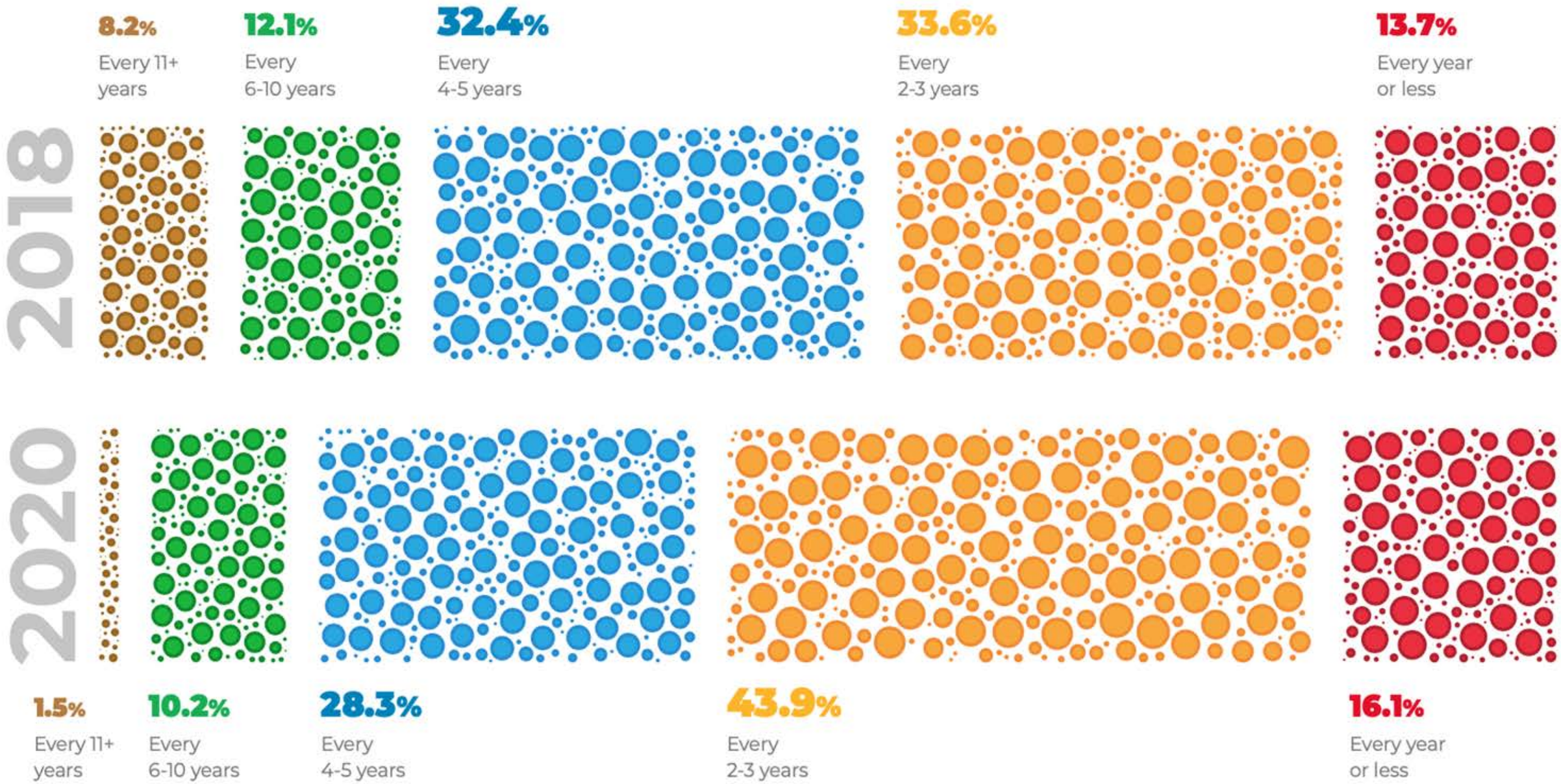
Engineers advanced equipment for producing metals with a high degree of readiness (powders, alloys), using processes at the intersection of different sciences (biometallurgy, etc.).

CROSS-PROFESSIONAL SKILLS

job to emerge before 2020 — before 2020

3. Enterprise level

How often do you need to reinvent your company to survive and thrive?

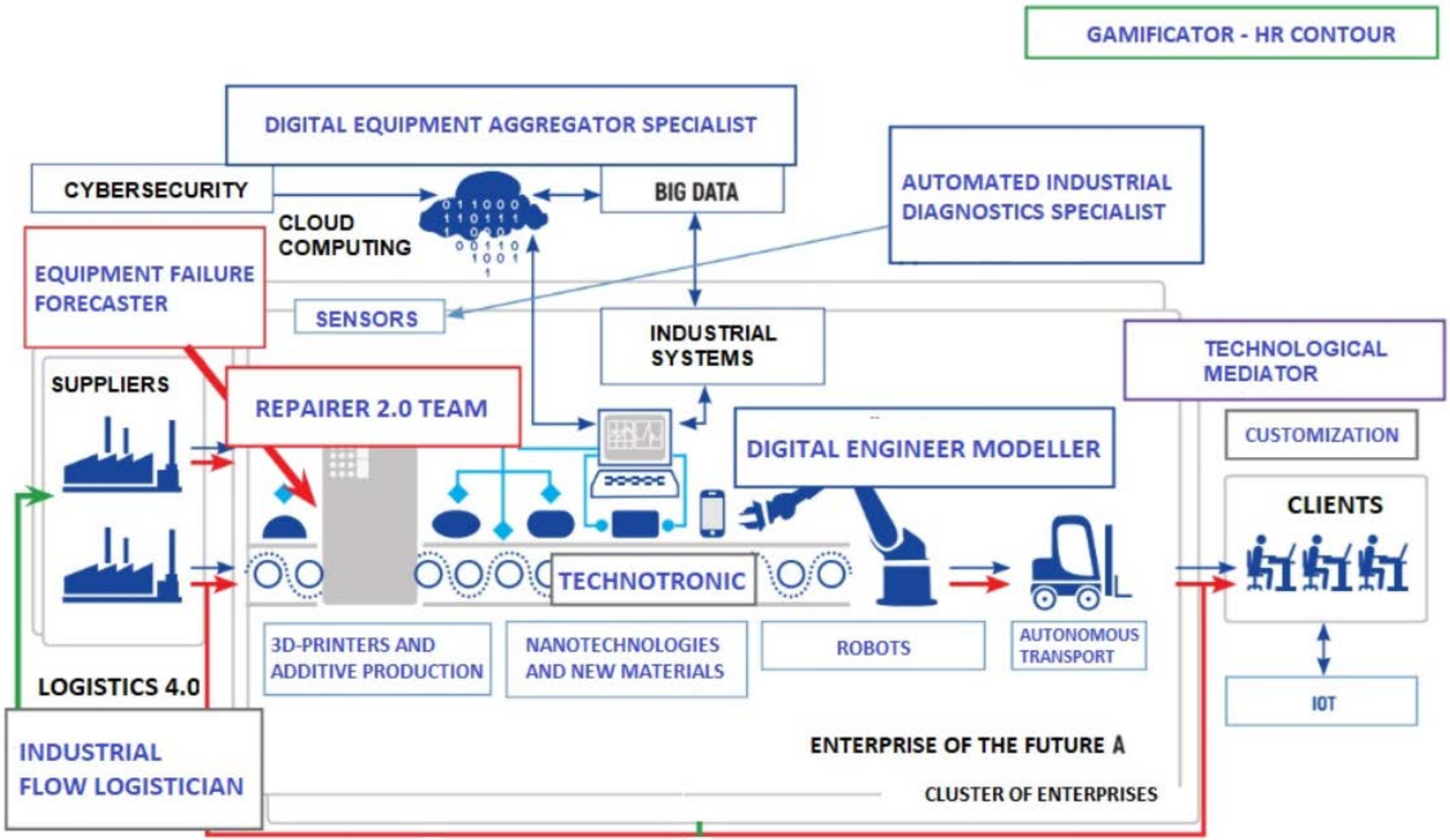


Case 1. Atlas of Emerging Jobs Chelyabinsk Pipe Plant (Russia)

Tatiana Kozhevnikova

Director for Organizational Development, Chelpipe (Chelyabinsk Pipe Plant)

Why is the Atlas useful for us? The Chelyabinsk Pipe Plant is actively involved in career guidance for high school students, and if new metallurgical specialties appear in the Atlas as it develops, we will be able to interest children in those specialties. They will be able to see metallurgy not as something from the past but as an exciting future. They may become fascinated with physics and mathematics and later obtain a degree in metallurgy. We regard the Atlas as a means of promotion, to distinguish metallurgy as a decent career choice.



Lifetime Career Map of a White Metallurgist

Case 2. Atlas of New Professions at Donskoy Mining Enterprise KazChrome JSC (Kazakhstan)

Donskoy Ore Mining and Processing Plant
One of the world's largest chrome and ore mining plants. The chrome ore deposits mined by DGOK as part of the main deposit are about 22 km long and 7 km wide

2ND IN THE WORLD BY PROVEN RESERVES

MORE THAN 7,500 EMPLOYEES SUPPORT THE COMPANY'S OPERATIONS