



WORLD BANK GROUP  
Jobs



SOLUTIONS  
FOR YOUTH  
EMPLOYMENT

## Using Artificial Intelligence for Job Matching Platforms

Thursday, February 20, 2020 | 9:30am – 11:00am EST | G8-090 & Webex

# Skilllab

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Karim Bin-Humam, Director of Project Delivery

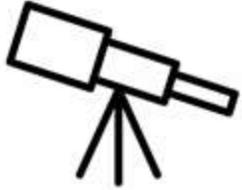
# Skilllab

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AI-based competency  
profiling for labour market  
inclusion

# Skillob Vision & Mission

We outlined our “North Star” to guide us over a three year horizon...



## Vision

A world in which everyone is empowered to follow their dreams and access opportunities regardless of their background to contribute socially and economically to their society.



## Mission

To help uncover personal pathways to social and economic participation based on a person’s skills, interests, and values.



## Partners

Public, private, and civil society organizations working to support the inclusion of people traditionally excluded from labour markets

# Labour market marginalization

Traditional labour market approaches exclude disadvantaged groups

Who are you?



Syrian, Woman, Refugee

## Exclusion



### Titles



- Project manager
- Transfer pricing consultant
- Education specialist
- Athletics director

### Degrees



- Bachelor of Science (B.Sc.)
- Master of Fine Arts (MA)
- Certified Public Accountant (CPA)
- Doctor of Medicine (MD)

### Networks



- Employers & academic references
- Industry associations and trade groups
- References

# Labour market inclusion

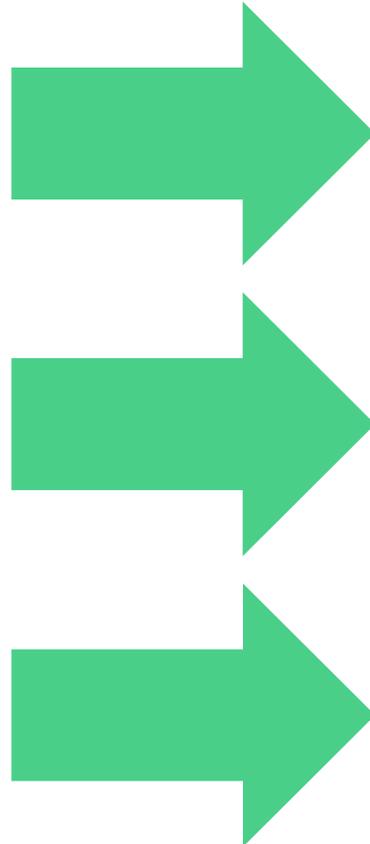
Competency profiling makes skills visible and marketable

What can you do?



Reem Nauh

## Inclusion



### Skills



- Sterilization techniques
- Handle customer expectations
- Utilize measurement instruments
- Cater meals for large events

### Knowledge



- Organic chemistry
- Human physiology
- Clinical cytology
- Event planning & coordination
- Industrial cooking processes

### Ambitions

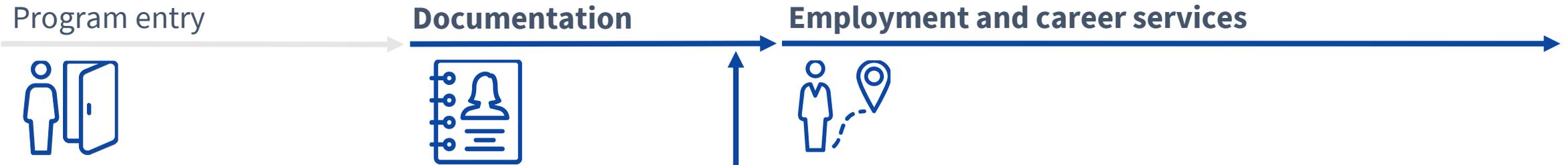


- Flexible hours to support a family
- Human interaction
- Culture
- Event planning & coordination

# Use Case: Refugees in Europe



# Use Case: Refugees in Europe



An AI-based skill profiling tool generate rich skill profiles for job seekers fast and in any language.



## Key features



Job seekers use mobile app in **native language** and results get automatically translated



Independently performed skill assessment, using a **database of 13,485 skills**



**Skill-based matching** to 2,942 occupations in the European labour market



Culturally and sector specific **resume templates** to export results

# Our Solution: Competency Profiling with AI

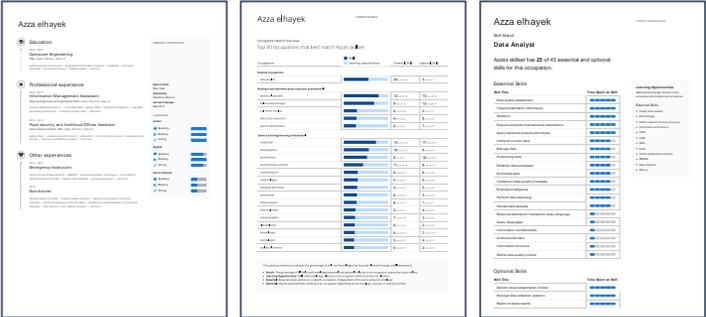
Our Skill assessment is always embedded in existing services



## Job Seekers

Use mobile app to perform skill assessment and explore results

Invites



## Skill Assessment is used for:



**Career Counselling** by showing how a job seekers skill set fits into the job market



Skill and competence-based **job matching**



Identify learning opportunities to recommend **vocational training**



## Counsellor

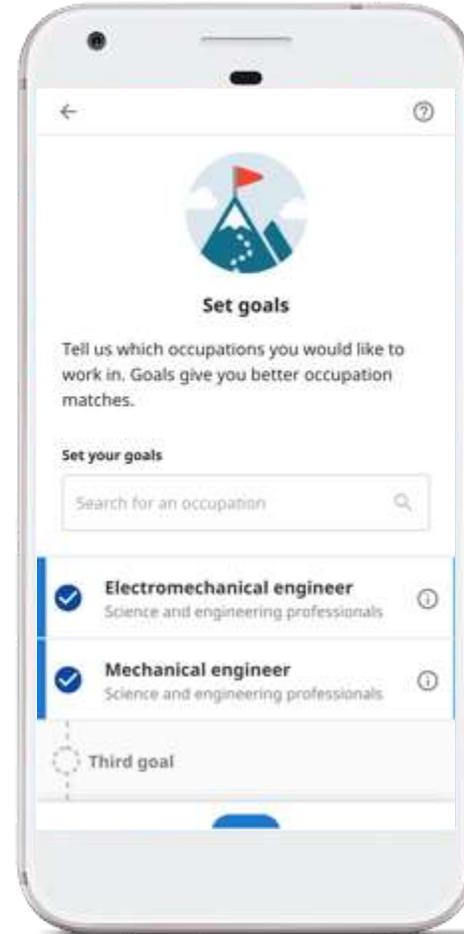
Can access the results of skill assessment via admin portal

# Mobile application: On-boarding

As a first step, job seekers register to perform the skill assessment

## Invitation

- 1 Career advisors invite job seekers by email
- 2 Job seekers install app or register online for skill assessment.
- 3 Job seekers register and provide personal information for resume



## Intuitive workflow

The mobile app is designed for ease of use and allows job seekers to develop their skill profile independently and on their own device

# Mobile application: Timeline

Job seekers build a timeline of all their jobs, education and other experiences

Timeline

Job seekers add all relevant experiences

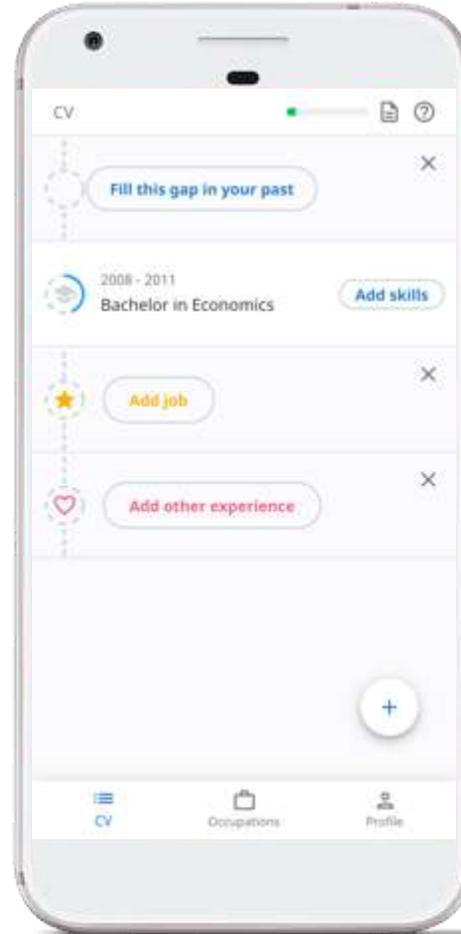
Jobs



Education



Other



Guidance to complete timeline

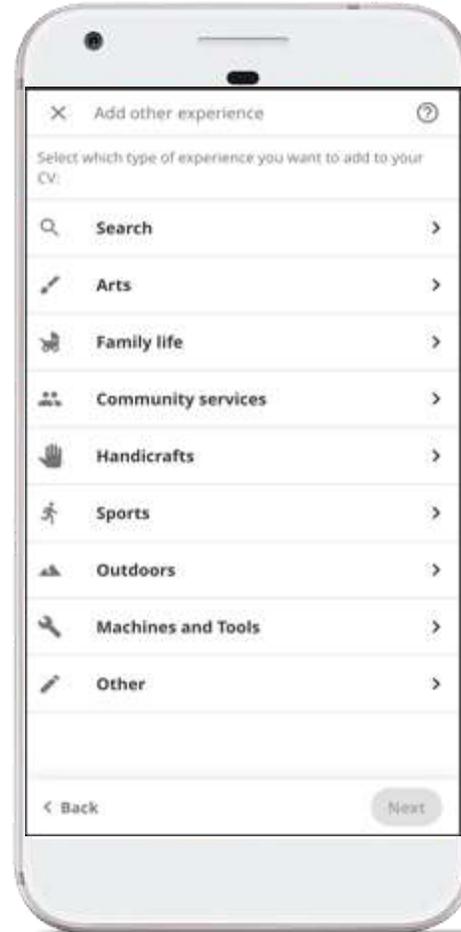
Messages guide the user to file all relevant experiences

# Mobile application: Timeline

Job seekers build a timeline of all their jobs, education and other experiences

Timeline

**Capture informal experiences during which skills are learned**



**Skills are captured outside of the formal workforce**

Parenting for example requires child care skills, planning and logistics, and many other skills

# Mobile application: Skill assessment

Job seekers perform a skill assessment for every experience on their timeline

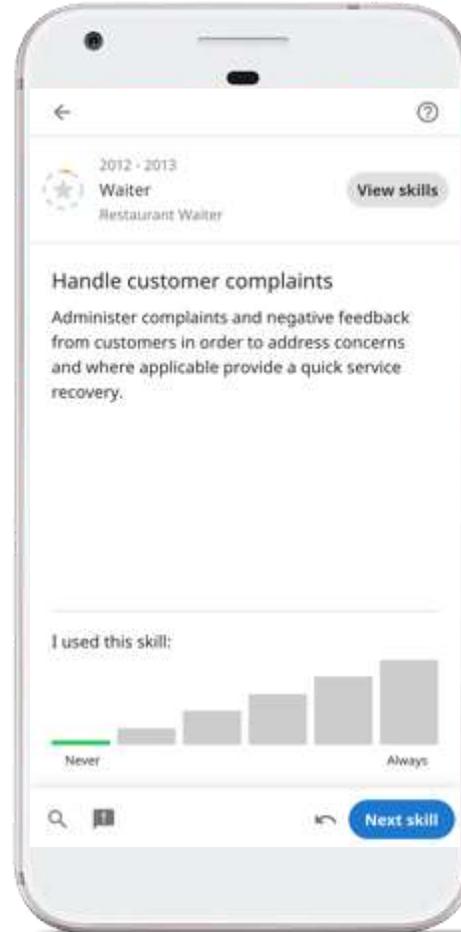
## Assessment

### Progress indicator

The assessment continues till the assessment engine explored experience

### Experience intensity

Job seekers indicate if and how intensely they used a skill



### Interview by assessment engine

Drawing on a database of 13,485 skills, our Artificial Intelligence (AI) interviews the job seeker

# Mobile application: Occupation Matches

Job seekers use the occupation match overview to orient themselves in the labour market

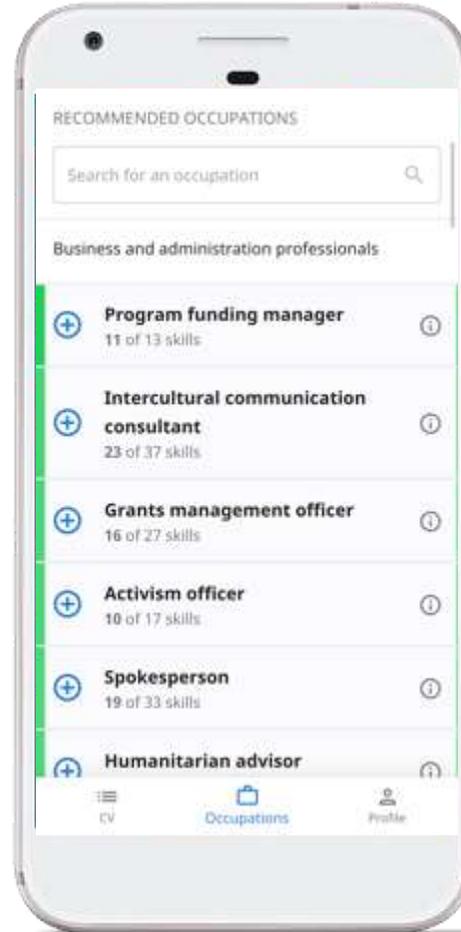
## Career goal orientation

Users can browse occupations, review their suitability, and adapt their stated career goals

## Ranked matches

A comprehensive list of occupations ranked by skill fit

## Occupation Matches



## Searchable list of occupations

Users can explore how their skill set matches to any of nearly 3,000 recognized occupations

# Mobile application: Skill matches

Users can explore in detail how their skills match any occupation

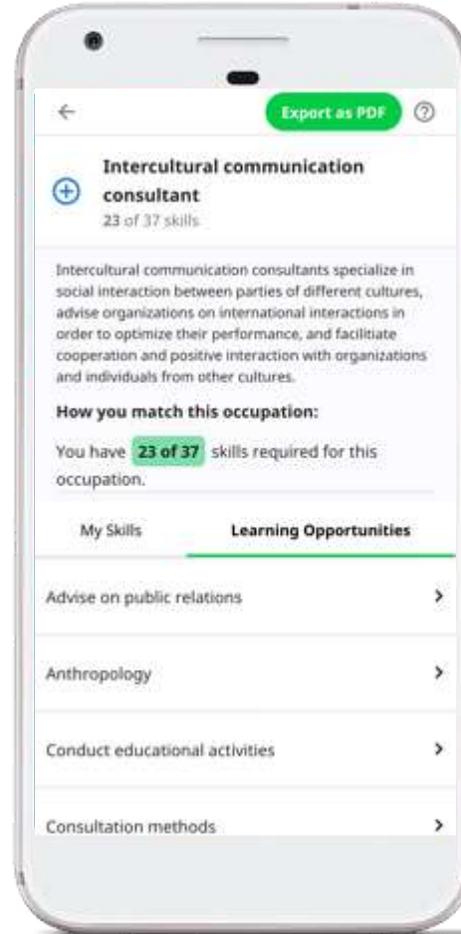
## Occupation description

The user can use the model to explore specific occupations in greater depth

## Relevant skills

A breakdown of which skills the user has which are relevant to a occupation

## Skill Matches



## Learning opportunities

Highlights the skill gap of the user for an occupation, and forms the basis for targeted upskilling and training

# Skill profile: Resume

A visually appealing overview of all experiences and the main skills acquired during those

## Automatic generation

Job seekers choose a design template and export their resume as PDF document in any of the 27 supported languages

Explore Results

**Azza elhayek**

**Education**  
2002 - 2007  
**Computer Engineering**  
IUG - Gaza, Palestine, State of  
leather goods components • geographic information systems • database • technical drawings • survey techniques • dispose waste • +3 more

**Professional experience**  
2014 - 2017  
**Information Management Assistant**  
Food and Agriculture Organization FAO - Gaza, Palestine, State of  
identify statistical patterns • normalize data • gather data • business intelligence • use data processing techniques • interpret current data • +48 more

2013 - 2014  
**Food security and livelihood Officer Assistant**  
Action Contre la Faim ACF - Gaza, Palestine, State of  
gather data • analyze economic trends • economics • monitor field surveys • interview focus groups • conduct quantitative research • +47 more

**Other experiences**  
2014 - 2018  
**Emergency focal point**  
record survey measurements • SAB000 • visual presentation techniques • use different communication channels • handle data samples • survey techniques • +12 more

2012  
**Nutritionist**  
discuss weight loss plan • prepare lesson content • support individuals on nutrition changes • nutritional adequacy of food intake • identify the health benefits of nutritional changes • offer advice on diet-related concerns • +5 more

**PERSONAL INFORMATION**  
Date of birth  
May 1984  
Nationality  
Palestine, State of  
Arrival in Europe  
May 2018

**LANGUAGES**  
**Arabic**  
Speaking: [5 bars] [5/5]  
Reading: [5 bars] [5/5]  
Writing: [5 bars] [5/5]  
**English**  
Speaking: [5 bars] [5/5]  
Reading: [5 bars] [5/5]  
Writing: [5 bars] [5/5]  
**Dutch; Flemish**  
Speaking: [5 bars] [5/5]  
Reading: [5 bars] [5/5]  
Writing: [5 bars] [5/5]

## Application-ready resume

Listing all experiences and skills, job seekers can include this document in any application

# Skill profile: Occupation overview

A ranked list of occupations to which a job seeker's skills match best

## Skill-based matching

Based on their skill assessments, job seekers are matched to 2,942 occupations. All occupations are ranked by their skill match, and show any learning opportunities.

Explore Results



## Orientation in the labour market

An ideal foundation for career advisors to propose new employment opportunities and educational pathways

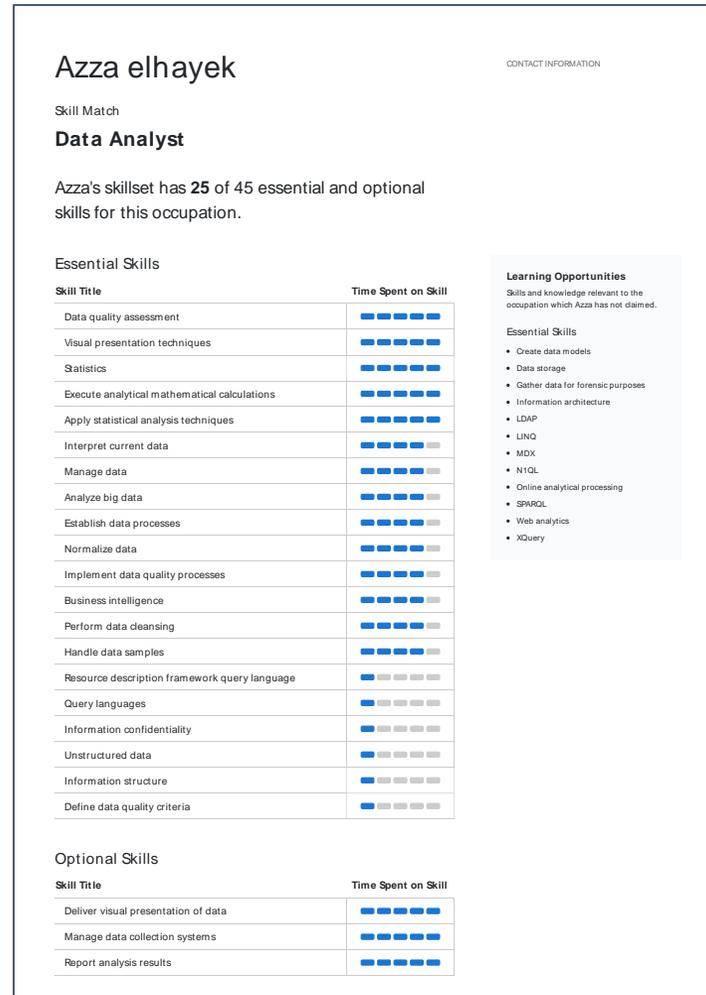
# Skill profile: Skill match

A detailed analysis of how a job seeker's skill set matches to a specific occupation

## Detailed overview

At one glance, career advisors see all the skills a job seeker holds or needs to learn to pursue a specific occupation

Explore Results



## Personalized career advise

Career advisors get an ideal foundation to propose new employment opportunities and educational pathways

# Administration portal: Review user profiles

Detailed review of individual skill profiles for improved career services

## Individual Skill Profiles

Review in detail any individual's complete skill profile

## Browse & Search

Search for specific skills and occupation matches

The screenshot displays the SkillMap administration portal for a user profile. The browser address bar shows the URL: .app/projects/admin/amsterdam/profiles/513. The page title is "SkillMap Proof of Concept". The user profile is for "Mohammed [REDACTED]". The profile status is "Active". The user has 6 experiences and 188 skills. The last activity was 12 days ago. The profile is viewed in the "SKILLS" tab. A search bar is present above the "Experience Skills" table. The table lists various skills with their corresponding strength bars, job titles, and keywords.

Search	Strength	Experiences	Experience Types	Keywords
<b>Experience Skills</b>				
Follow health and safety procedures in construction	■■■■■■■■■■	Bouwerker, Carpe...	job	bicycle mechanic, ...
Work ergonomically	■■■■■■■■■■	Bouwerker, Carpe...	job	bicycle mechanic, ...
Use safety equipment in construction	■■■■■■■■■■	Bouwerker, Carpe...	job	bicycle mechanic, ...
Maintain work area cleanliness	■■■■■■■■■■	Bouwerker, Carpe...	job	bicycle mechanic, ...
Keep personal administration	■■■■■■■■■■	Bouwerker, Carpe...	job	bicycle mechanic, ...
Maintain relationship with suppliers	■■■■■■■■■■	Bouwerker, Motor...	job	bicycle mechanic, ...
Inspect construction supplies	■■■■■■■■■■	Bouwerker, Carpe...	job	carpenter, constru...
Provide customer follow-up	■■■■■■■■■■	Fracht, Ma...	job	bicycle mechanic, ...

## Generate Documentation

Automatically generate skill profile documents for the job seeker

# Skill profile access

Job seekers and career advisors access the Skill Profile in four formats



## Mobile Application

Mobile application: Job seekers explore all results directly on their mobile phone



## Admin Portal

Web interface that career advisors use to administer and monitor Skill Profiles



## Documents

Skill profile can be exported as PDF, using different design templates



## API connection

Skilllab's skill assessment tool can be integrated into external systems via an API feed

Results





 **Google AI**  
Winner Impact Challenge

**Google.org Impact Challenge**  
**Award winning use of AI for social good**

# Why AI?

## The benefits of using AI to capture competencies



### Navigate Complexity

Quickly zero in on the relevant competencies among thousands



### Aided Expression

Reduce the burden of self-expression by guiding the user to navigate their experiences and competencies



### Exponential Improvement

Reduce the burden of self-expression by guiding the user to navigate their experiences and competencies

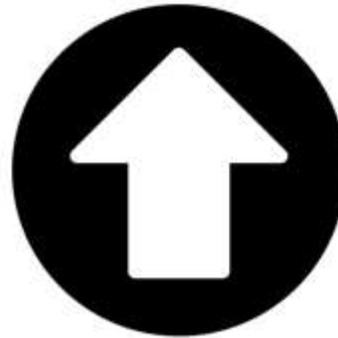
# Benefits for marginalized job seekers

Uncovering one's own hidden talents

*"I was embarrassed because I haven't worked for the past few year while I was raising my children. But to see "Home Manager" on my resume and all the skills I gained was really exciting!"*

**Rasha, Syria**

## Confidence



*"At first I was too embarrassed to participate because I know I have no work experience, but now I feel confident because I believe that I have skills to offer."*

**Anwar, Iraq**

*"I was really happy that I could comfortably express myself in my native language, knowing that employment services would see the results in Finnish"*

**Abdallah, Syria**

**Help job seekers take ownership and control over their career planning**

*"After seeing the results, I feel encouraged to be more ambitious about my future. I have the feeling that I used to underestimate my abilities"*

**Hiba, Iraq**

# Benefits for marginalized job seekers

A new way to explore one's own skills and discover opportunities

*"The application helped me to dust off skill from my past that I had even forgotten I even had."*

**Taha, Sudan**

*"I've been in Amsterdam for four years now. If I had this application when I arrived, it would have saved so much time and effort to plan my future here."*

**Jalal, Yemen**

## Inspiration



**Help job seekers explore themselves and new opportunities**

*"Before using the app, I really struggled capture and express the skills I got in my past jobs here in Greece."*

**Moses, Gambia**

*"I was completely surprised that I am not too far from being a 3D animator which could be a great option if a can't find work as a game developer"*

**Regis, Brazil**

# Benefits for marginalized job seekers

Taking ownership over the job-placement process

*“Employment services only ask us about our certificates. They never ask us what we can actually do. I think the skill profile covers the gap of information that our counsellors badly need.”*

**Majed, Palestine**

*“For the first time I feel that I have a plan that I created myself and want to follow. I know what I want to reach.”*

**Abeer, Iraq**

## Empowerment



**Help job seekers take ownership and control over their career planning**

*“This application is the best application I used in this context. It will help me hold employment services accountable for better career support.”*

**Ahmed, Syria**

*“Interviews with counsellors take a lot of time and effort and even reflect our abilities. I would recommend my friends to use this app rather than relying on their counsellor”*

**Mohammed, Iraq**

# Benefits for career service providers

Skilllab's service improves the effectiveness and efficiency of employment and career services while empowering job seekers



## Process efficiency

More time for personalised career advice, as job seekers use app autonomously before consultations.

*"We had a waiting list of one month for consultations. We can't process people quickly enough and provide personalized service. This tool would help us do that."*

**Career Counsellor, Blue Refugee Center  
Thessaloniki, Greece**

*"We have seen other tools but this is much more sophisticated and detailed. It gives a much more granular sense of a client's skills"*

**Job Counsellor  
INE/GSEE**



## Greater Detail

A better sense for a person's capabilities helps to provide more personalized career services



## Better outcomes

Access all Skill Profiles at any time in the Admin Portal and achieve a higher success rate in job placement.

*"I've never had clients so excited to meet and discuss the next steps in their careers with me before doing this skill assessment"*

**-Fadma, Case worker  
City of Amsterdam**

# Partnering for inclusion



## Licenses

Get as many user licenses for the skill assessment mobile app and admin portal as you need



## Support

Book additional workshops, webinars, trainings and remote support to get the most out of the product



## Branding

Get as many user licenses for the skill assessment mobile app and admin portal as you need



## Customisation

Add additional language support, special data hosting requirements, integration with your IT systems, etc.

# Pilots performed

Skillob already successfully performed pilots with cities and organisations across Europe



# Want to learn more?

We partner directly with CDA to meet your needs



## Schedule a demo

See in detail how our application works



## Test it out

Have us set up a test account for you to try the application in real life



## Schedule a discussion

Describe your ideas and programs and inquire whether our application could be useful to you and how



# Skilllab

[www.Skilllab.io](http://www.Skilllab.io)

[info@Skilllab.io](mailto:info@Skilllab.io)

# JobKred

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Gary Gan, Co-founder

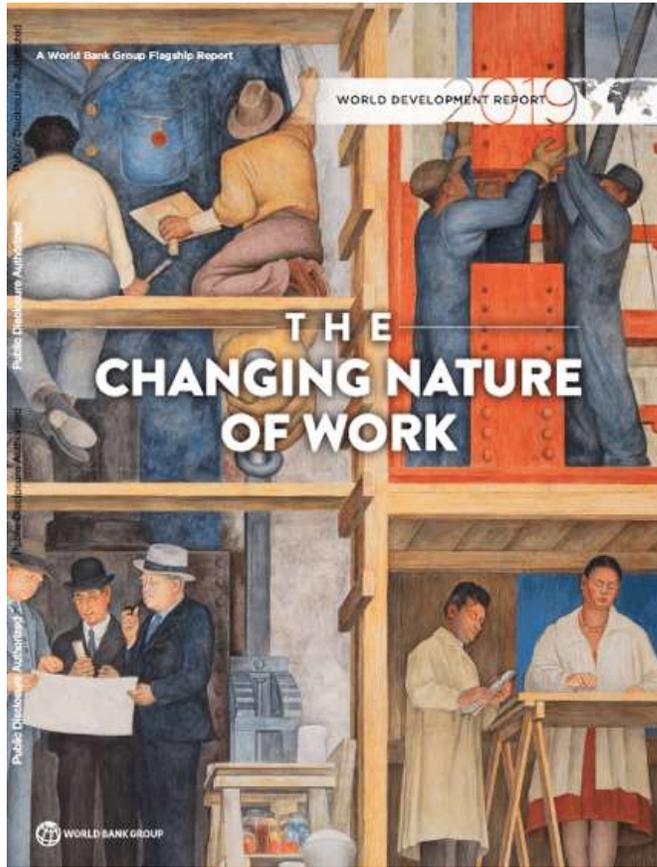


JobKred

# Using AI for Job Matching

Gary Gan  
*Co-Founder and CEO, JobKred, Singapore*  
*gary@jobkred.com, +65 9792 4393*

*World Bank SAYE Webinar, 20 Feb 2020, Thur, 9.30 – 11.00 am*



*World Development Report  
2019, World Bank*

*“The most significant investments that people, firms, and governments can make in the changing nature of work are in enhancing human capital.”*

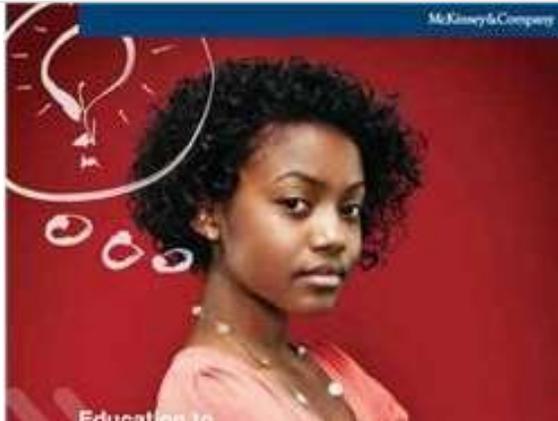
# Changing Talent Landscape

More pronounced changes to ensue in the new decade

McKinsey  
& Company

11 DEC 2012

**72% of Education Providers Believe That Their Graduates are Ready For Work But Less Than Half of Students and Employers Agree**



**START OF THE DECADE**

BUSINESS  
INSIDER  
SINGAPORE

18 JUN 2019

**3 in 4 Singaporeans say they weren't taught enough skills to excel at work – and millennials feel the worst prepared**



**END OF THE DECADE**

Deloitte.

Global Business  
Coalition For  
Education

18 SEP 2018

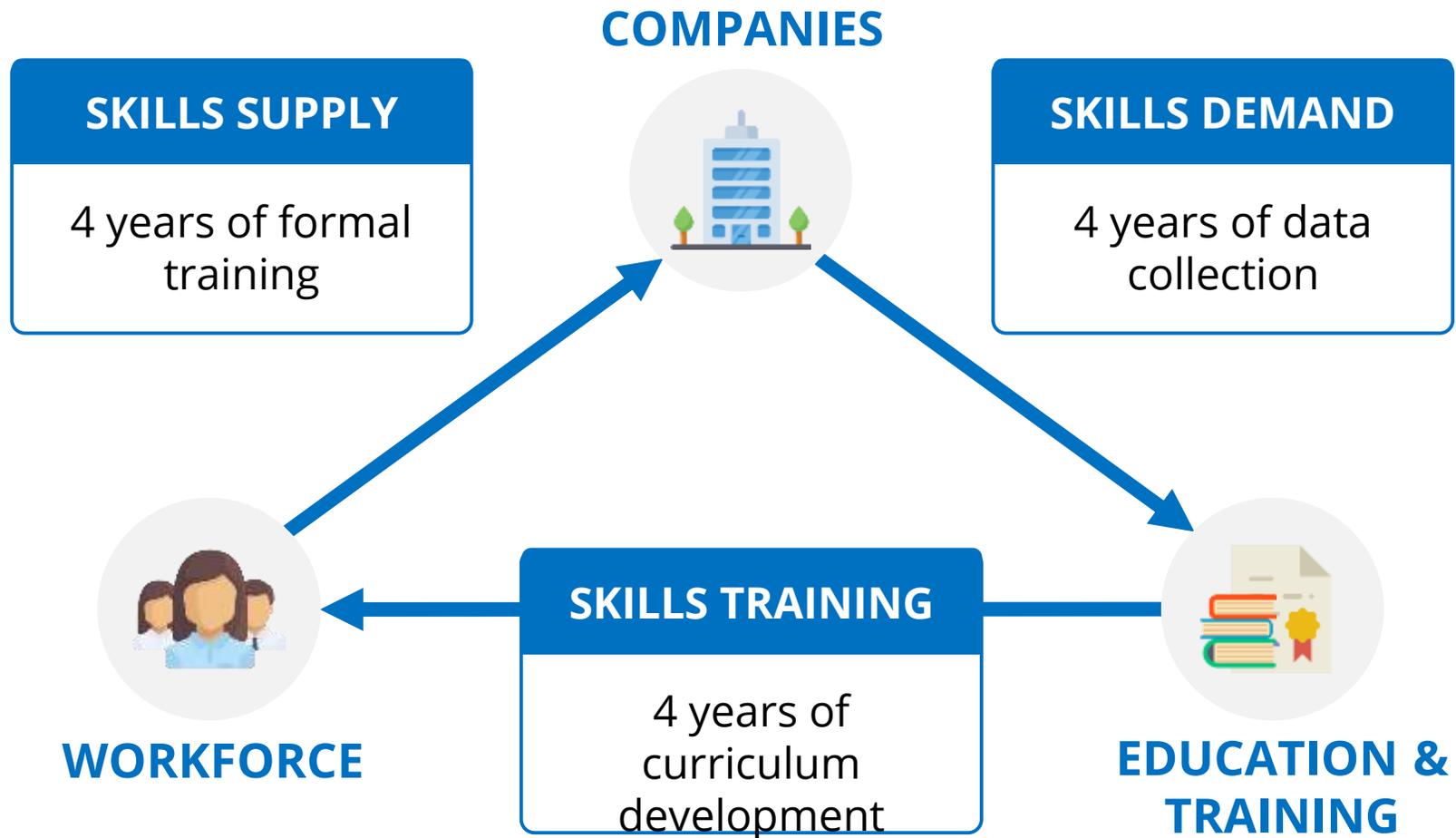
**By 2030, two billion youth worldwide will lack skills to participate in the workforce**



**THE NEXT DECADE**

JobKred

# Slow and unfocused HR planning



# Current Methods of Skills Demand Assessment



## Direct Industry Consultation

- Not standardized
- Slow
- Small sample
- Subjective



## Surveys and Focus Groups

- Not skills-based
- Slow
- Expensive
- Outdated quickly



## Skills Frameworks

- Not granular
- Slow
- Expensive
- Outdated quickly



# Rethinking skills anticipation and planning

# Fast, agile and targeted HR planning



Big Data Analytics to decode **employer demand** and predict **future skill requirements**



**Intelligent skill-gap analysis** and **personalised** digital career guidance

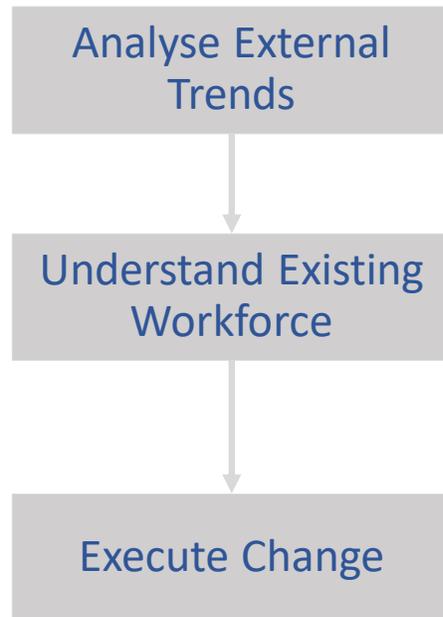


Automatic mapping of curriculum to **granular skills** and **modular education** for youth and adults

# Taking an AI-driven Approach

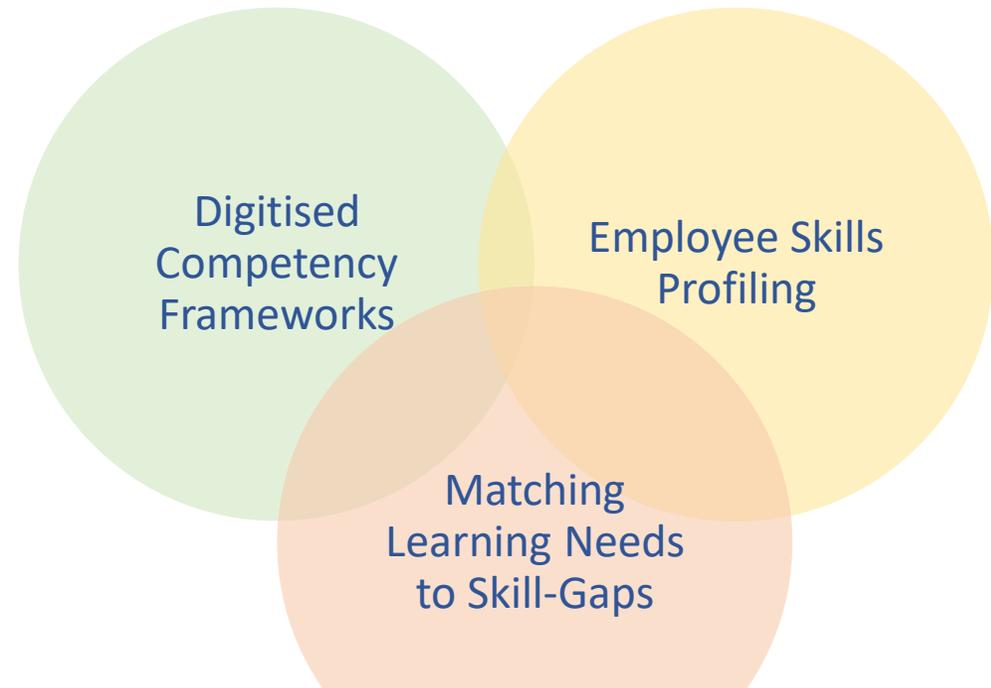
Embracing technology in HR Development

Traditional



Repetitive Cycle With Short Relevance

Embracing Technology



Building an Adaptive Learning Ecosystem

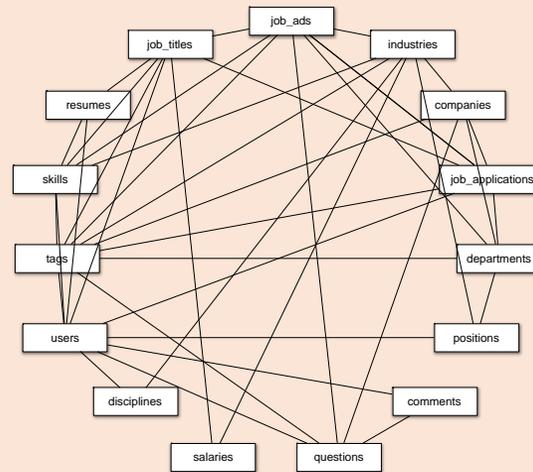
# Reinventing the future of workforce... with data-driven insights

DEPARTMENT OF  
**STATISTICS**  
SINGAPORE



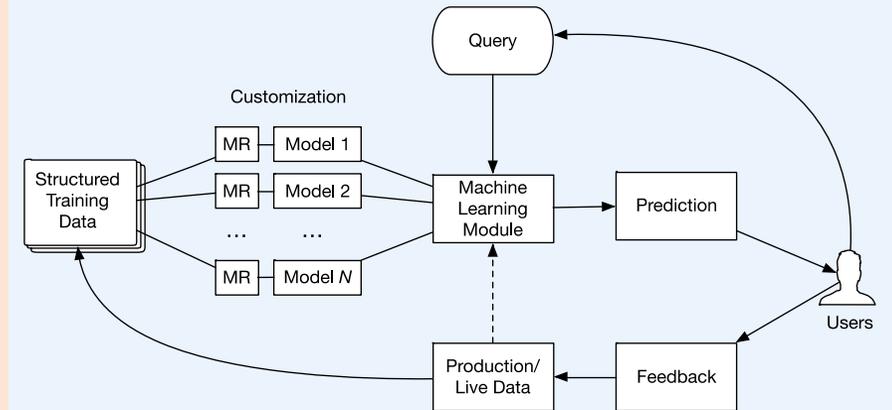
## Data Mining

Indexing data from multiple sources



## Statistical Analysis

Data cleansing and relational extraction



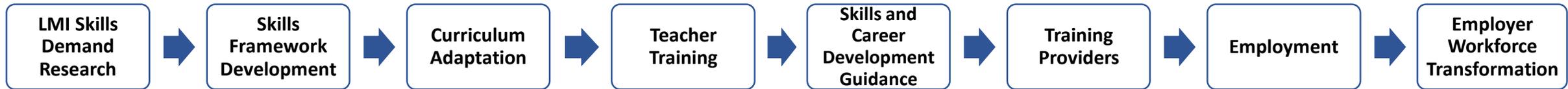
## Predictive Modelling

Customized model based on required context

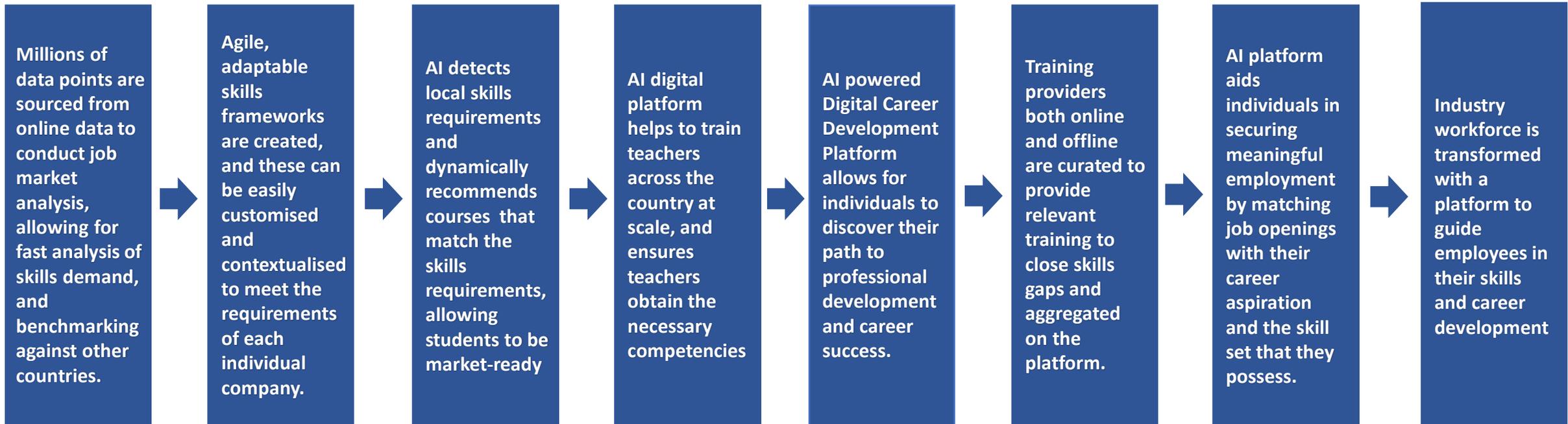
## BACKGROUND OF WORKFORCE TRANSFORMATION

- 1.** In the ever-changing world of work, it is critical to ensure that the skills supply of the working population matches the skills demand of the industry
- 2.** The key challenges are to effectively identify current industry skills demand, then personalize training and career recommendations to each individual student or working adult, to help close skills gaps and land high quality jobs
- 3.** By adapting the best technology, experts, training providers and practices in Education and Workforce Transformation from Singapore, your country can ensure that your citizens are future-ready for Industry 4.0

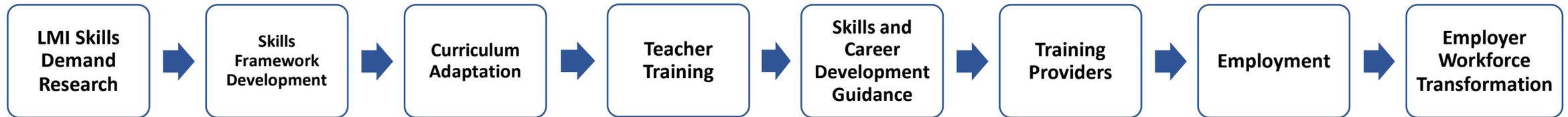
## STEPS TAKEN FOR TRANSFORMATION



## INNOVATION IN STEPS TAKEN



# Workforce Transformation Value Chain



- Essential to quickly and effectively match skills supply to skills demand
- AI can learn from real-time LMI to recommend careers, training and jobs
- Existing case studies from other countries already utilizing such technology
- AI technology can be utilized in both developing and developed nations

## LMI SKILLS DEMAND RESEARCH

With the ever-changing future of work, new methodologies are needed to understand, in real-time, the skills demand of the country. Traditionally, surveys, interviews and focus groups would be conducted with stakeholders in the labour market, such as employers and industry associations. The results are then compiled into a report to inform policy makers. This normally takes years of work, and is a very expensive and tedious process for all parties involved.

### CASE STUDY: MYANMAR LABOUR MARKET ANALYSIS



JobKred collaborated with JobNet, a Myanmarese job portal, for local data collection of key sectors and job titles for analysis. Data cleansing then took place in order to obtain most in-demand job roles and skills requirements in Myanmar, and they were mapped using JobKred's taxonomies. Data analysis was then conducted to identify high-demand job titles and sectors, and to obtain changes and trends.

### HOW IT WORKS



Data collection



Data Cleansing



Data Analysis

### JOBKRED'S VALUE TO MYANMAR'S LABOUR MARKET RESEARCH

JobKred's AI is trained by millions of data points from online data sources, user profiles, job postings, social media, government sources, etc. Using big data, data science and predictive analytics, data can be used to identify high-demand/high growth sectors and occupations, examine demand for key skills and benchmark local labour market intelligence against global labour market information. Over 20,000 data points were collected and cleaned up before information regarding employer demand for labour and skills relevant to the job titles were obtained. Data was cleaned and processed into a report within a few weeks, rather than across multiple months in traditional labour market research.

### PARTNERS

Consultancies such as EY and PwC can complement JobKred's big data analysis with traditional surveys, focus groups and interviews, as well as conduct consultancy sessions with policy makers to make sense of the data.

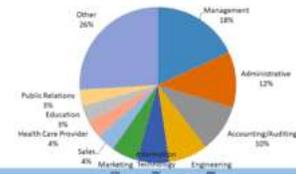


# LMI Skills Demand Research (Example)

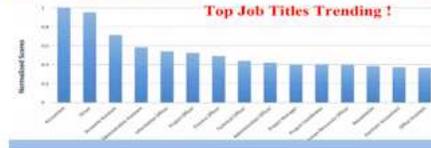
TEVET Policy Review  
Malawi

Figure 1.20 Examples of insights from the Myjobs.com jobsite

Decoding job demand trends 2016-2018:  
Top job function trends in Malawi



Malawi: Decoding demand for paid jobs:  
The top 15 job titles trending in 2016 to 2018



Top 100 job titles in demand in Malawi  
Trending in 2016-2018

16. Procurement Officer	17. Teacher	33. Executive Assistant	34. Customer Support
18. Technician	19. Laboratory Technician	35. Program Manager	36. Project Officer
20. Laboratory Technician	21. Administrative Manager	37. Administrative Assistant	38. Program Assistant
22. Administrative Officer	23. Marketing Manager	39. Marketing Assistant	40. Program Assistant
24. Coordinator	25. Finance Manager	41. Finance Assistant	42. Finance Assistant
26. Sales City Clerk	27. Program Manager	43. Program Coordinator	44. Program Assistant
28. Program Manager	29. Program Coordinator	45. Program Assistant	46. Program Assistant
29. Program Manager	30. Program Coordinator	47. Program Assistant	48. Program Assistant
30. Program Manager	31. Program Coordinator	49. Program Assistant	50. Program Assistant
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39. Program Manager	40. Program Coordinator	67. Program Assistant	68. Program Assistant
40. Program Manager	41. Program Coordinator	69. Program Assistant	70. Program Assistant
41. Program Manager	42. Program Coordinator	71. Program Assistant	72. Program Assistant
42. Program Manager	43. Program Coordinator	73. Program Assistant	74. Program Assistant
43. Program Manager	44. Program Coordinator	75. Program Assistant	76. Program Assistant
44. Program Manager	45. Program Coordinator	77. Program Assistant	78. Program Assistant
45. Program Manager	46. Program Coordinator	79. Program Assistant	80. Program Assistant
46. Program Manager	47. Program Coordinator	81. Program Assistant	82. Program Assistant
47. Program Manager	48. Program Coordinator	83. Program Assistant	84. Program Assistant
48. Program Manager	49. Program Coordinator	85. Program Assistant	86. Program Assistant
49. Program Manager	50. Program Coordinator	87. Program Assistant	88. Program Assistant
50. Program Manager	51. Program Coordinator	89. Program Assistant	90. Program Assistant
51. Program Manager	52. Program Coordinator	91. Program Assistant	92. Program Assistant
52. Program Manager	53. Program Coordinator	93. Program Assistant	94. Program Assistant
53. Program Manager	54. Program Coordinator	95. Program Assistant	96. Program Assistant
54. Program Manager	55. Program Coordinator	97. Program Assistant	98. Program Assistant
55. Program Manager	56. Program Coordinator	99. Program Assistant	100. Program Assistant

Malawi: Identifying skills in high demand in 2016-2018:  
What's trending in Administrative, Management, Accounting, Engineering?

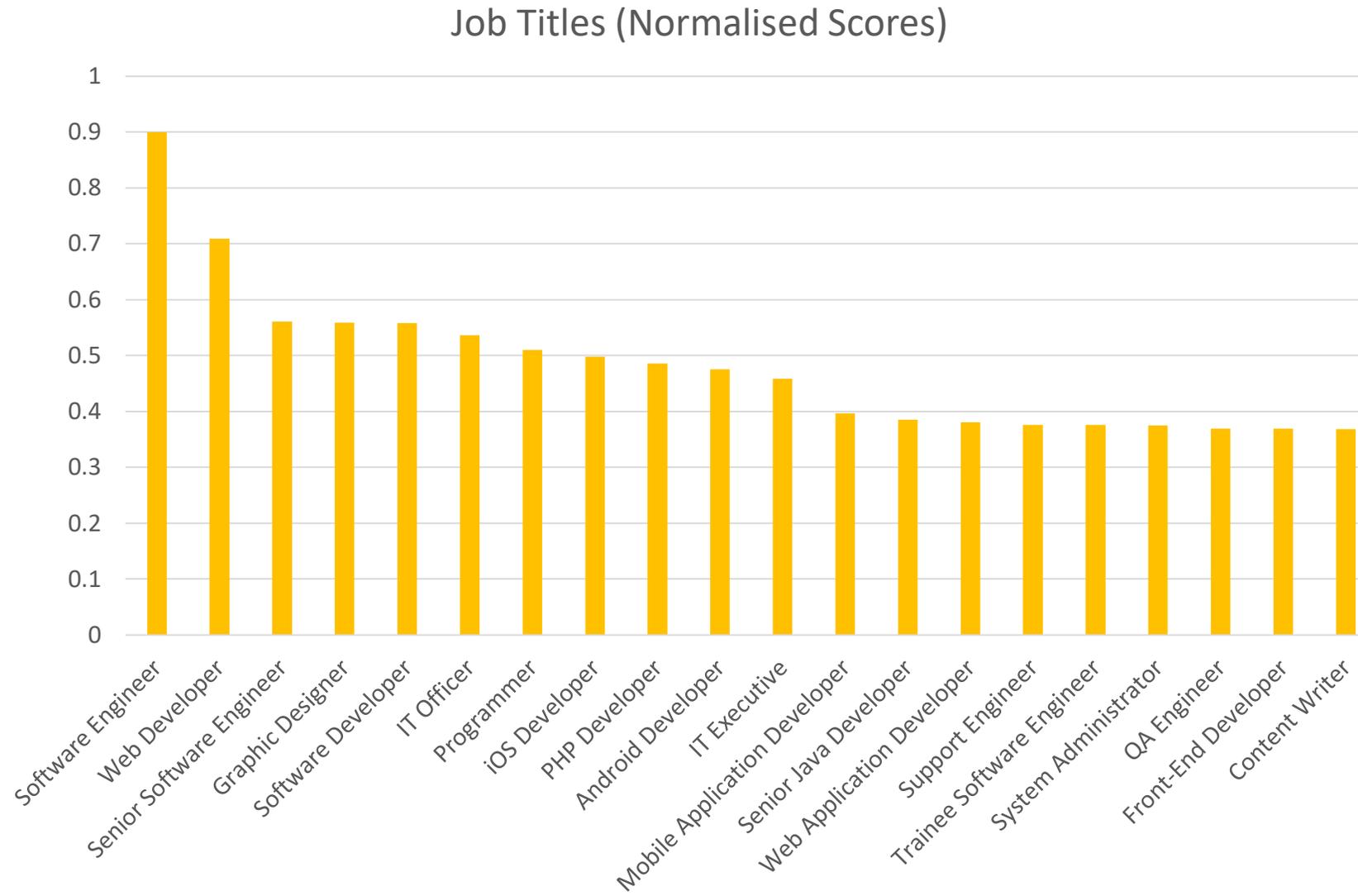
Management	Administrative	Accounting/Auditing	Engineering
1. Microsoft Office	1. Microsoft Office	1. Tax	1. User Manufacturing
2. Microsoft Word	2. Microsoft Excel	2. Financial Reporting	2. Continuous Improvement
3. Microsoft PowerPoint	3. Microsoft Word	3. Financial Analysis	3. Six Sigma
4. Customer Service	4. Microsoft Word	4. Corporate Tax	4. Drilling
5. Customer Service	5. Customer Service	5. Auditing	5. Oil/Gas
6. Social Media	6. Social Media	6. Income Tax	6. Electronics
7. Research	7. Research	7. Internal Controls	7. Commissioning
8. Teamwork	8. Teamwork	8. Tax Preparation	8. Product Development
9. Public Speaking	9. Public Speaking	9. Budgeting	9. Project Engineering
10. Event Planning	10. Event Planning	10. Forecasting	10. Upstream

Decoding skills demand in Malawi: For Accountants

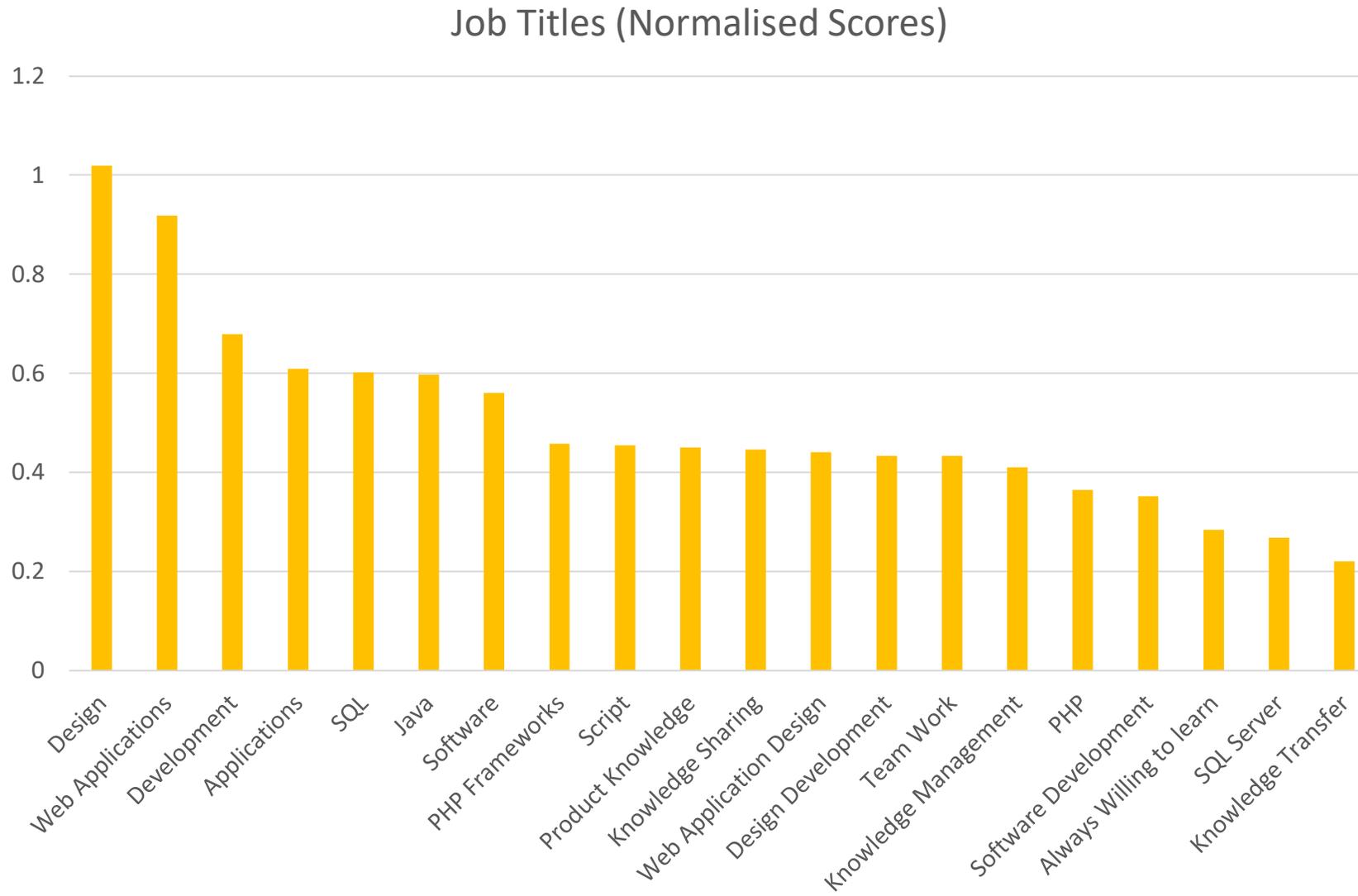


Source: authors' elaboration of big data/BI analysis powered by JobKred.com and data provided by Myjobs.com

# Regional Market Insights – top 20 job titles by demand (for IT sector)



# Regional Market Insights – top 20 skills by demand (for IT sector)



# Information Technology

# #1

## Job Demand by Industry

### Top 10 Skills for Software Engineer

01	Web Applications
02	Design
03	Software Development
04	SQL
05	Development
06	Applications
07	Software
08	Web Application Design
09	Knowledge Management
10	SQL Server

### Top 10 Skills for Web Developer

01	Java
02	PHP
03	Script
04	SQL
05	PHP Frameworks
06	Web Applications
07	CSS JavaScript
08	Product Knowledge
09	Web Application Design
10	Development

### Top 10 Skills for iOS Developer

01	Applications
02	GIS Applications
03	Design
04	Web Applications
05	Mobile Applications
06	Development
07	Mac OS
08	Always Willing to learn
09	Mobile Phone Apps
10	Mac OS X

## SKILLS FRAMEWORK DEVELOPMENT

Skills Frameworks are typically created by countries to guide the development of the industry or sector. Examples include USA's Employability Skills Framework, Europe's European Qualifications Framework, and Singapore's Skills Framework. These frameworks would cover the type of jobs in the industry, the skills and competencies required, and even the definitions of jobs and skills, down to the proficiency level of each skills. Individuals can use the Skills Framework to make informed choices on career development and skills upgrading. Employers design progressive human resource practices to recognise skills and make informed decisions on skills investment. Training providers can develop industry-relevant programmes to respond quickly to employers' and individuals' needs.

### CASE STUDY: SKILLSFUTURESG

SKILLSfuture SG

In partnership with consultancies and industry associations, data was gathered quickly and easily from stakeholders, using JobKred's AI engine. Global data was also instantly available from JobKred for overseas benchmarking. This data was used to quickly create, review and update Skills Frameworks, reducing the lag time to understand industry changes and requirements.

### HOW IT WORKS



Global Data  
Collection



Reference Skills  
Framework



Own  
Data

### JOBKRED'S VALUE TO CREATION OF SKILLS FRAMEWORKS

Industry demands are constantly changing, and traditional methods of creating Skills Frameworks makes them obsolete the moment they are created. JobKred is able to provide the customisation and contextualisation of Skills Frameworks, benchmarked using Big Data Analytics against local and global standards. For countries without an existing Framework, JobKred can easily leverage on our experience working with Singapore government, and our global data, to help create Skills Frameworks localized to the country's context, in a fraction of the time traditional methods take. This allow for faster transformation of the country.

### PARTNERS

JobKred can partner with consultancies like EY to create industry specific Skills Frameworks. EY has helped Singapore create half of their existing frameworks, and also utilizes JobKred's data in their work.



JobKred

# Skills Future Frameworks

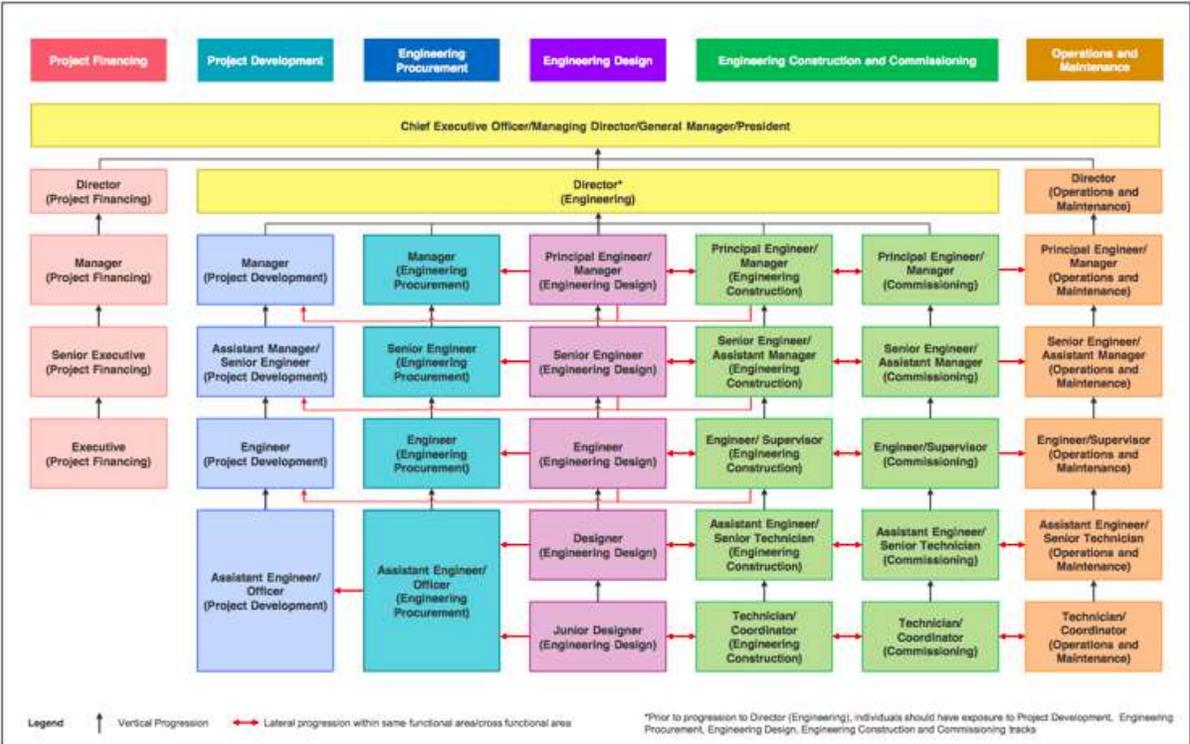
## SKILLS FRAMEWORK FOR RETAIL Career Pathways



Front-of-House comprises the Retail Operations track  
Back-of-House comprises the Brand Management, Marketing, Merchandising and E-Commerce (Omni-Channel) tracks

↑ Denotes vertical career progression  
↔ Denotes lateral (cross-functional) career progression across tracks

## SKILLS FRAMEWORK FOR ENGINEERING SERVICES Career Pathways



↑ Vertical Progression  
↔ Lateral progression within same functional area/cross functional area

\*Prior to progression to Director (Engineering), individuals should have exposure to Project Development, Engineering Procurement, Engineering Design, Engineering Construction and Commissioning tracks

The Career Map serves as a reference to reflect the available job roles and possible career pathways in the Engineering Services sector, which may vary depending on each company's structure and business context. The career progression pathways would depend on individual performance, capability, experience, aspiration, as well as company needs.

## CURRICULUM ADAPTATION

With the awareness of local labour market skill and jobs requirements, countries will consider changes to their curriculum or even their educational courses to ensure that skills supply matches skills demand. Educational institutions may also discuss with local employers, to better ensure their curriculum matches their needs.

This process can take ten years or more, to understand local skills requirements, make changes to curriculum, implement these changes, and guide students and parents to understand these changes.

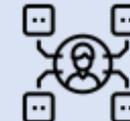
### CASE STUDY: ADAPTIVE CURRICULUM SYSTEM

JobKred worked with a Technical Vocational Institute in Singapore to design a system to use JobKred's global and local data to instantly understand skills demands, then map the schools curriculum to the skills requirements, and implement a recommendation engine to help recommend the right courses dynamically to students, based on local skills demand. This would cut down the lag time in pushing the right courses to students and ensure graduating students have market ready skills.

### HOW IT WORKS



Course Mapping



Skills Gap  
Analysis



Course  
Recommendations

### JOBKRED'S VALUE TO CURRICULUM ADAPTATION

JobKred is able to change the status quo in the maintenance of curriculums for educational institutes, and ensure easy implementation of curriculum updates and course recommendations to students.

AI powers recommendations for careers, courses and micro-learning. Students can now craft their own personalised learning journey and ensure their skills match current labour market demands. For example, students will be able to select modules that are more relevant for them to pursue a certain career in the future

### PARTNERS

For educational institutions who find that they do not have the necessary courses or cannot adopt the curriculum that the market needs, a temporary measure can be to provide courses from online providers, or bring in external training providers with the capabilities to deliver relevant courses to students.. JobKred partners with global MOOCs like Udemy, Coursera, Udacity, or Singapore educational institutions like Singapore Polytechnic, to provide the right training the country needs.



## TEACHER TRAINING

Once the curriculum is adapted to suit the needs of students, the staff who teach the curriculum also have to be trained in order to deliver the curriculum effectively.

Countries may have to train thousands of teachers across a large geographical area, and ensure that training needs is done for each teacher, the right training interventions are pushed to the teacher, and track the competency and capabilities for all teachers. This is expensive and time consuming, thus curriculum changes tended to be slow to push out, and teachers slow to learn and adopt changes, leading to students not being able to benefit.

### CASE STUDY: NATIONAL UNIVERSITY OF SINGAPORE



Using our AI workforce development platform, JobKred is able to help NUS modernize their entire competency and training framework for all 13,000 academic and non-academic staff. Implementation is also easy for the school, with the AI taking care of skills gap analysis, training recommendations and training delivery, so that the school could transform their workforce quickly, easily and at low cost.

### HOW IT WORKS



Skills Gap  
Analysis



Training  
Recommendations



Training Delivery  
Nationwide

### JOBKRED'S VALUE TO TEACHER TRAINING

JobKred is able to change the status quo in the maintenance of curriculums for educational institutes, and ensure easy implementation of curriculum updates and course recommendations to students.

AI powers recommendations for careers, courses and micro-learning. Students can now craft their own personalised learning journey and ensure their skills match current labour market demands. For example, students will be able to select modules that are more relevant for them to pursue a certain career in the future

## PARTNERS



## SKILLS AND CAREER DEVELOPMENT GUIDANCE

With the rapidly changing world of work, effective career guidance can help individuals understand where they fit in and what path to take. Singapore for example has two career guidance teams, one for students and one for working adults. Student guidance counsellors are attached to every secondary school all the way to tertiary level, and guide students on career choices and job seeking advice. Adult counsellors help the unemployed and those seeking to change careers. The challenge comes when the world of work moves too fast for human guidance counsellors to keep up, and also when there is a rapidly increasing need for guidance, leading to a lack of counsellors, and expensive programs to train and hire more counsellors.

### CASE STUDY: NATIONAL TECHNOLOGICAL UNIVERSITY (NTU)



National Technology University required a platform where 30,000 students would be able to explore career options and visualise the steps that they would need to take in order to work towards a career of their choice. A mentorship feature was also required so that the students could be attached to mentors in order to learn more about the industry they want to work in.

### HOW IT WORKS



SPRI



Setting up of mentorship

### JOBKRED'S VALUE TO SKILLS AND CAREER DEVELOPMENT

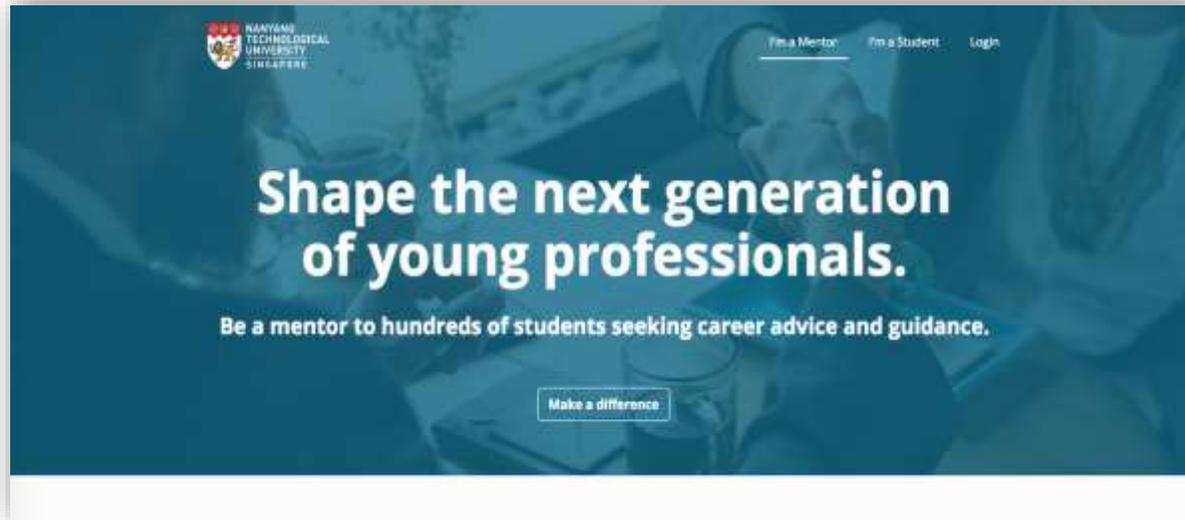
JobKred's AI powered Digital Career Development Platform helps students and working professionals to discover their paths to professional development and career success. The system guides users to the right careers and identify skills gaps. Users will be empowered to build their personal profile articulate their skills through through system recommended skill based vocabulary. The users' skill sets are then analysed to recommend careers and highlight skill gaps in career recommendations. It empowers users in the discovery of new relevant career option.

90% of users said it helped them to better identify their skillset. 72% of users said it helped to them to discover more career options and discover more career transition pathways. 82% of users said it better helped them to identify their learning needs.

### PARTNERS

JobKred can work with Singapore's National Career Development Association to train & Certify Career Coaches, so that there is a combination of technology to address career guidance needs at scale, but also trained and qualified human coaches to provide high-touch guidance.



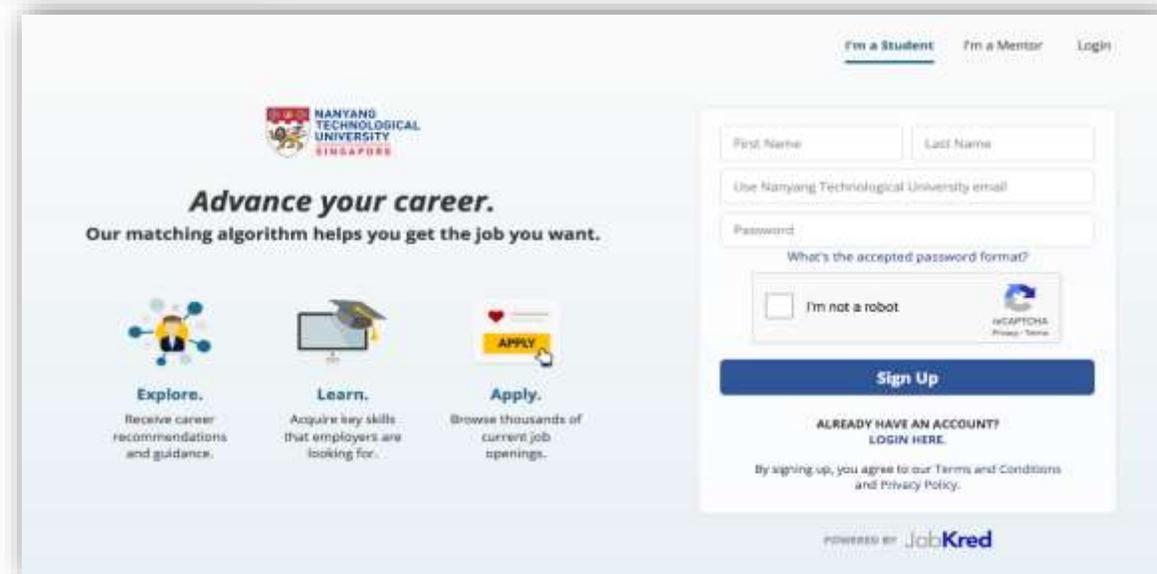


## For Mentors

Mentors are encouraged to assist their mentees in setting career goals, giving them the guidance needed to reach those goals and allow them to network effectively.

## For Students

Students will identify their career goals and options, exploring various career recommendations that are personalised to them.



## TRAINING PROVIDERS

Training providers can be aggregated into one platform to help provide a catalogue of training courses for citizens to access. The problem comes when there are too many courses to select from, such that citizens do not know what courses are relevant for them.

### CASE STUDY: MY SKILLS FUTURE



My Skills Future (My SF) is a one-stop portal that enables Singaporeans of all ages to make informed learning and career choices, so that they can pursue their skills and career development throughout their lives. Individuals are able to discover a career path that is suitable for them, explore the various industries available and upskill themselves to find jobs. JobKred provides AI matching technology to My SF.

### HOW IT WORKS



Skills Gap Analysis



Training Recommendations

### JOBKRED'S VALUE TO THE PROVISION OF TRAINING

JobKred is able to aggregate data from our partners into an online platform and push out course recommendations relevant to the career choices that the user is interested in. It enables users to instantly identify skills gaps and close skills gaps through course recommendations. This allows for personalised training for all citizens. When users are able to visualise their skill gaps through our system and have a wide variety of courses at their finger tips, they feel more incentivized to embark on their own personal development, which allows for them to be able to aspire for the careers that they wish to take up in the future.

## PARTNERS

JobKred has a ready platform, similar to My SF portal, to deliver skills gap analysis, course recommendations and training content nationally. JobKred has also partnered with a number of training providers, to offer a wide variety of courses that help individuals learn new skills, no matter what industry that may be working in currently.



## EMPLOYMENT

Employers need a place to effectively reach out to talent such as students, graduates and current workforce, to inform them of their job openings and manage the applicants. Jobseekers need an easy place to receive job opening information and find the ones that match their skills and career aspirations. Government needs to track the data of matches in real time.

The challenge is doing the job posting and job matching at scale. Currently, Singapore has a national online jobs portal used by 200,000 citizens every week, and tens of thousands of employers.

### CASE STUDY: MYCAREERSFUTURE

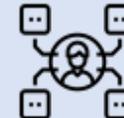


MyCareersFuture.sg (MCF) is a portal that aims to provide Singapore Citizens with a free job search service that matches them to relevant jobs based on the jobseeker's skills. MyCareersFuture.sg complements the Singaporean Government's efforts to build an adaptable and competent workforce to prepare for careers of the future, based on skills and competencies. JobKred's AI powers MCF with job matching.

### HOW IT WORKS



Job Posting



Skills Analysis



Job Matching

### JOBKRED'S VALUE TO EMPLOYMENT

JobKred is able to connect jobseeker to career opportunities that are relevant to their skills. Thus, this reduces potential job mismatches as jobseekers will be able to identify jobs that are best matches to the skills they have. This is made possible through JobKred's job market analysis which is able to identify the skills required for certain job titles and map it back to the job seeking individual who possesses that skill.

The end product of job matching will be a workforce where individuals are able to find a job that matches their skill set well and employers are able to hire people who are the best fit for their company's skill requirements.

### PARTNERS

JobKred can work with Trade Associations and Industry Associations from Singapore to help operationalize job matching systems in other countries and offer jobs in Singapore. JobKred already deploys specialized job matching portals for the ICT and Arts Sectors in Singapore.



## In summary



### The Future of Skills

A traditional talent development and skills strategy will no longer suffice. Future skill sets need to be personalised, versatile and transferable



### Learning Intervention

Organisations & nations need to find an efficient way to identify suitable learning interventions and enable employee and citizen access to these new skills quickly



### HR and Technology

HR must lead the way to be data driven and embrace technology tools to manage HR services, staff learning experiences and adopt an anticipatory approach towards capability building and lifelong learning



# About JobKred

# Proven track record serving government and international organisations for skills upgrading

## GLOBAL



### Labour Market Information Research

Online labour market data & skills demand analysis

Bangladesh  
Myanmar  
Sri Lanka  
Malawi

## GOVERNMENT



### Singapore's National Jobs Portal

Personalised career and training and recommendations

200,000  
Weekly Users

## UNIVERSITIES



### Student Career and Skills Guidance

Scalable personalised career guidance and skills gap analysis

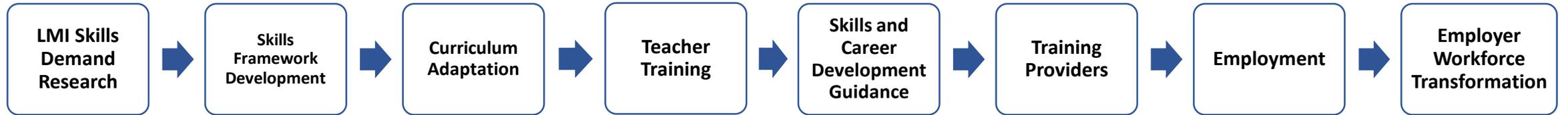
>33,000 Skills reported,  
12,000 Careers favoured

**IMDA GREEN LANE**  
Quality / Security assurance & compliance

**WHOLE-OF-GOVT PILOT**  
MOM, MOE, IRAS, NEA

**World Bank, ADB  
UNESCO, NAC, SGTech**  
Enabler of workforce transformation

# Technology to integrate for effective and efficient implementation



Skills Frameworks and LMI Data



## HRMS & LMS



Staff's Data and Records

**JobKred**

**90% Cost & Time Savings for Talent Transformation**

## Talent Recommendations



Using Big Data and Artificial Intelligence, our **proprietary software** decodes the inter-dependent relationships among industries, careers, jobs and skills.

- Our technologies guide individuals to profile the portfolio of skills they have, and what they need to learn in order to work towards their desired careers.
- On a larger scale, we inform teams, organisations, industries and nations of their skill profiles to enable effective interventions in workforce development and talent management.

### Developing The Brain

JobKred

-  **Data Mining**  
Indexing data from multiple sources
-  **Statistical Analysis**  
Data cleansing and relational extraction
-  **Predictive Modelling**  
Customized model based on required context

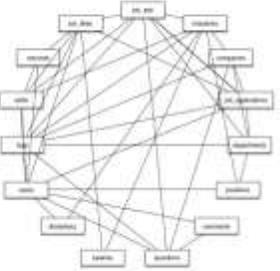
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### Statistical Analysis

JobKred

**Assumptions:**

- k-partite relationship**
  - Jobs-Skills
  - Jobs-Industries
  - Jobs-Salaries
  - Jobs-Tasks
  - Disciplines-Skills
  - Disciplines-Jobs
  - Jobs-Industries-Skills
- Importance**
  - Large enough sample size
  - Normalized frequency (occurrence)



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## Tech Stacks

JobKred

**Infrastructure**



**Applications**



**Data Science**



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JobKred

# Using AI for Job Matching

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*World Bank SAYE Webinar, 20 Feb 2020, Thur, 9.30 – 11.00 am*

# Q&A Discussion

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**Using Artificial Intelligence for Job Matching Platforms**  
**Thursday, February 20, 2020 | 9:30am – 11:00am EST | G8-090 & Webex**