

Skills Forecasting: the Foundation for agile Workforce Training Policies

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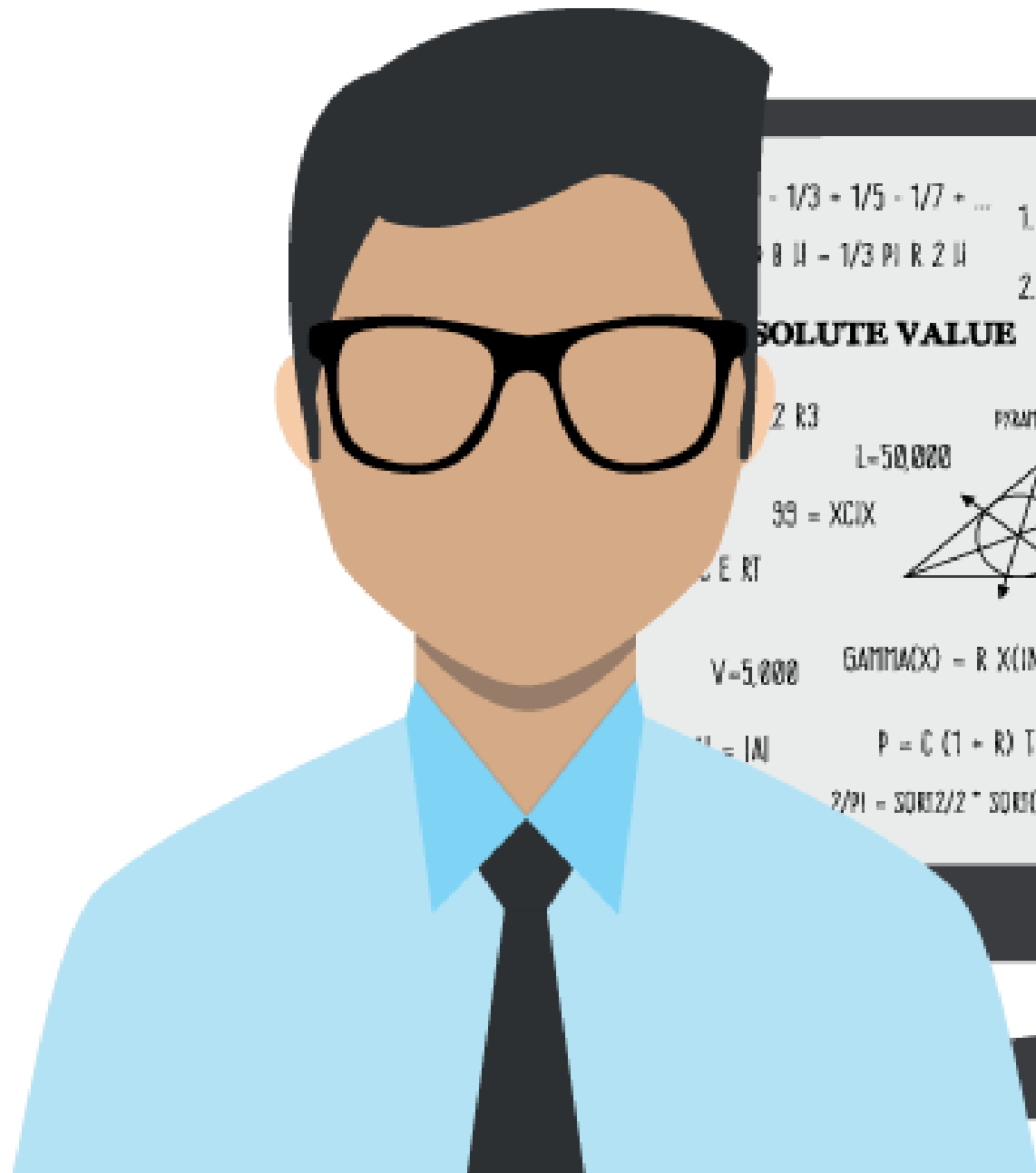
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Think Tank für die Gesellschaft im technologischen Wandel



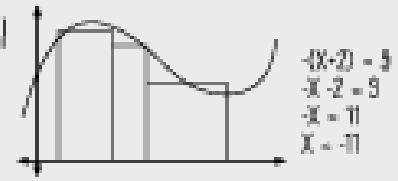
$$- 1/3 - 1/5 - 1/7 + \dots$$

$$1. | -A | = | A |$$

$$\text{GAMMA} = - \text{INTEGRAL}(0 \text{ TO } \text{INF}) E^{-X} \text{LN } X \text{ DX}$$

$$2. | A | \geq 0$$

$$| -23 | = | 23 |$$



ABSOLUTE VALUE

(M 0000 - OX 1101 - OX 2002)

$$2. R3$$

$$\text{PYRAMID} = (1/3) B H$$

$$4 \times \pi \times R^2$$

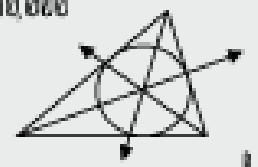
$$A + B = C$$



$$L = 50,000$$

$$99 = X C I X$$

$$\text{GAMMA}(X+1) = X \text{ GAMMA}(X)$$



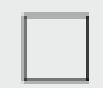
$$| A - B | \geq | A | - | B |$$

$$B = A (1 + R/\text{MONT} - P)$$

$$(1/2) D I D Z$$

$$V = 5,000$$

$$\text{GAMMA}(X) = R X (\text{INTEGRAL})(0 \text{ TO } \text{INF}) E^{-RT} T (X-1) DT$$



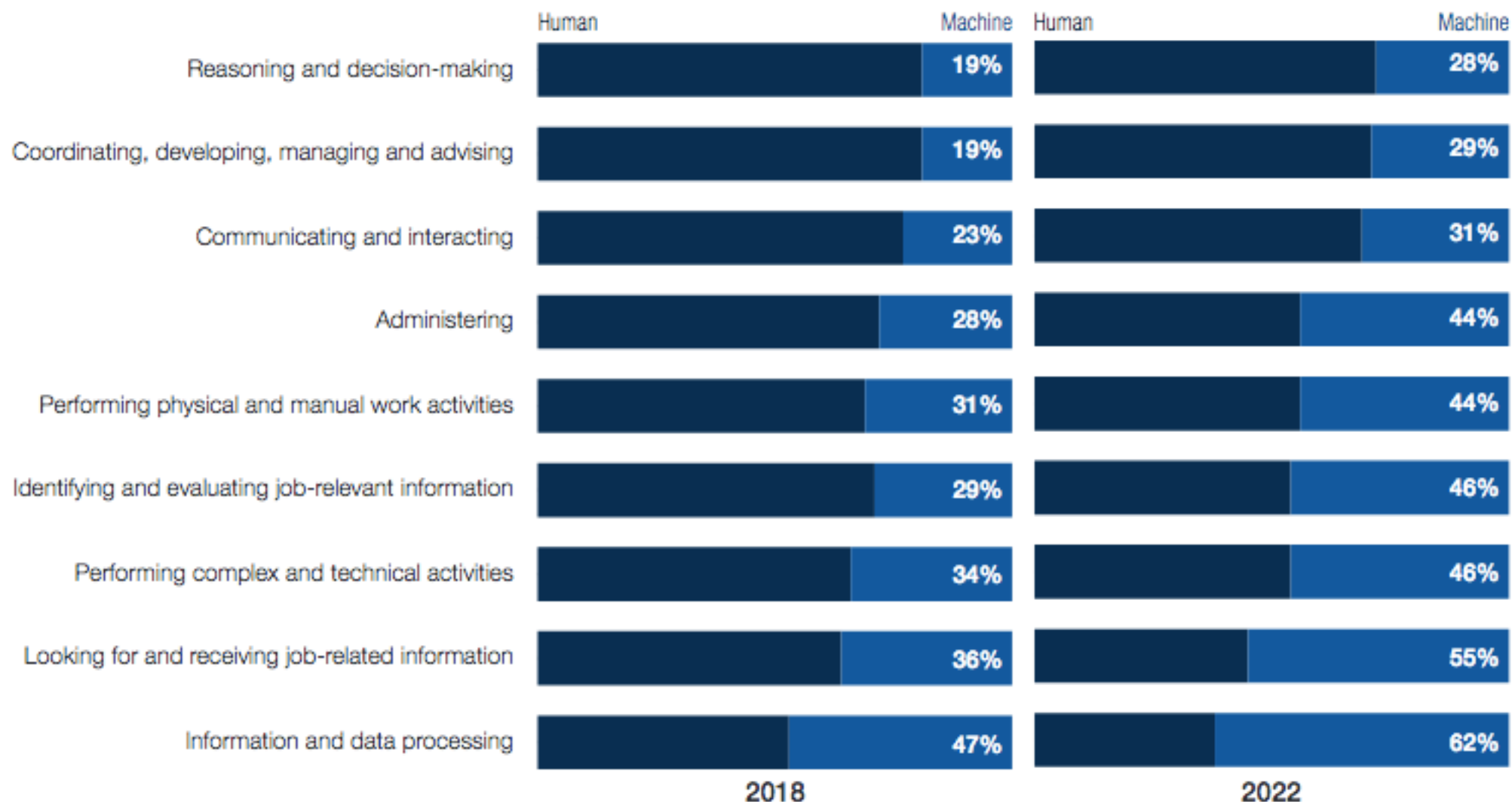
$$P = | A |$$

$$P = C (1 + R) T$$

$$2/\pi = \text{SQR}(2/2) * \text{SQR}(2 + \text{SQR}(2))/2 * \text{SQR}(2 + (\text{SQR}(2 + \text{SQR}(2)))/2) * \dots$$



Figure 5: Ratio of human-machine working hours, 2018 vs. 2022 (projected)



Source: Future of Jobs Survey 2018, World Economic Forum.



The Future of the Federal Employment Agency

Arbeitsministerin Andrea Nahles (SPD) will die BA in eine "Arbeitsversicherung" umwandeln. Ihr schwebt eine "Bundesagentur für Arbeit und Qualifizierung" vor, "die nicht nur bei Arbeitslosigkeit einspringt, sondern Arbeitnehmer so durchs Erwerbsleben begleitet, dass sie stets auf Augenhöhe mit dem technischen Wandel arbeiten können", sagte sie der "Frankfurter Allgemeinen Zeitung". Die BA solle eine "lebensbegleitende" Weiterbildungsberatung für alle bundesweit einführen. SPD-Kanzlerkandidat Martin Schulz hat die Pläne bereits in sein Programm aufgenommen.

BIG DATA FOR HUMAN RESOURCE



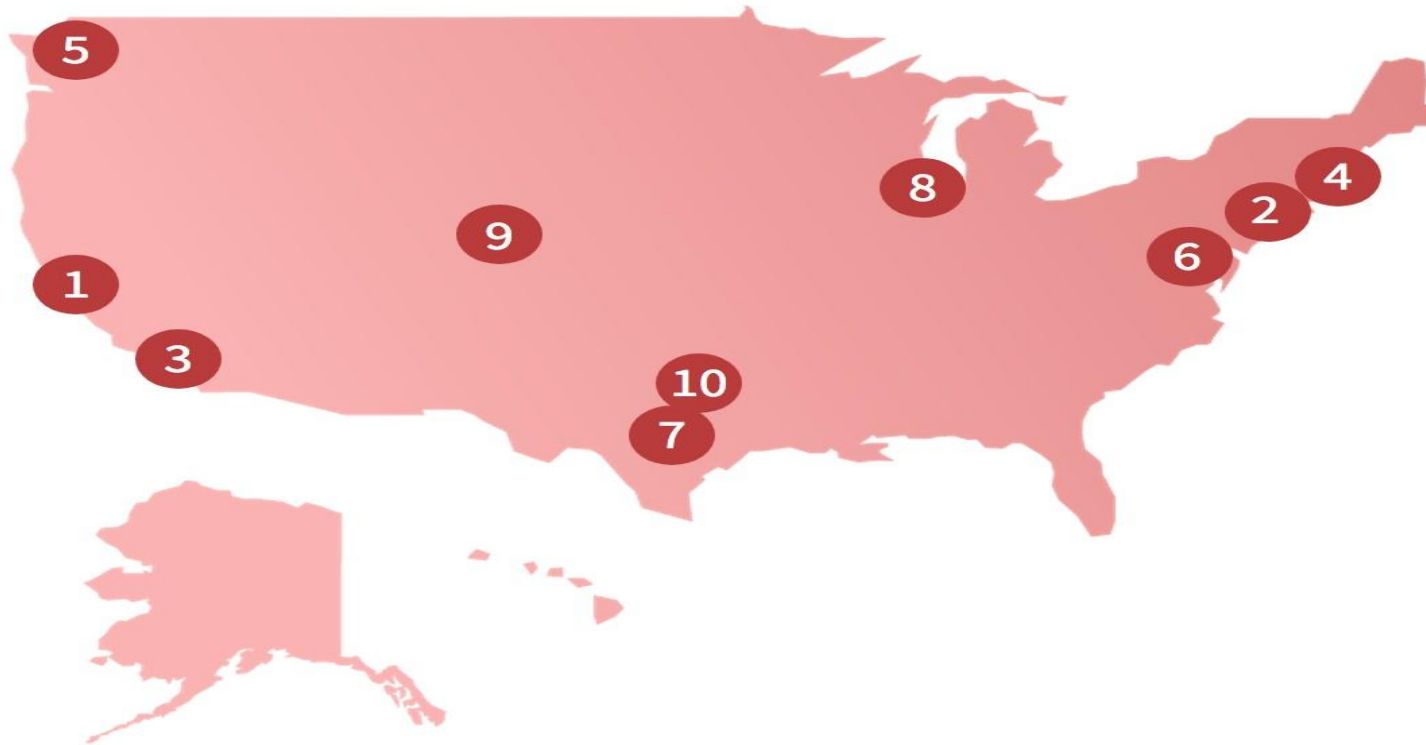
Predicting the Future Demand for Skills: new Data Sources for Skills Forecasting

- Job Platforms (Monster, Indeed, etc.)
 - Job Advertisements on the Web (web crawling)
 - Career Networks (LinkedIn, Xing)
 - ...
-
- And what about all the data from the federal employment agency and its local branches?

January 2019

Cities with the Largest Skills Shortages

- | | | | | | |
|---|----------------------------|---|------------------|----|-----------------------|
| 1 | San Francisco Bay Area, CA | 5 | Seattle, WA | 8 | Chicago, IL |
| | 1,282,673 people | | 418,357 people | | 250,542 people |
| 2 | New York City, NY | 6 | Washington, D.C. | 9 | Denver, CO |
| | 1,201,383 people | | 318,240 people | | 230,124 people |
| 3 | Los Angeles, CA | 7 | Austin, TX | 10 | Dallas-Fort Worth, TX |
| | 582,810 people | | 260,881 people | | 211,122 people |
| 4 | Boston, MA | | | | |
| | 419,243 people | | | | |



A skills gap is a mismatch between the skills employers need (demand) and the skills workers have (supply). Within a city, a skill is in shortage when employer demand exceeds local worker supply of that particular skill. Our skill demand measure comes from a weighted combination of the skills that appear in job postings on LinkedIn and the frequency that members in a city with a certain skill are hired relative to members without that skill. Skill supply is calculated as the number of members in a city who have listed a certain skill on their profiles. To develop the list of cities with the largest skills shortages, we aggregated and ranked the gross headcounts of all skills in shortage, by city.

Skills Companies hire for in Munich

Tab. 1: Nachgefragte Fähigkeiten von Neueinstellungen in den letzten 12 Monaten

Fähigkeiten/Skills	%
Machine Learning	25 %
Economics	25 %
Programming Languages: Perl/Python/Ruby	25 %
Software Revision Control System	24 %
Statistical Analysis and Data Mining	24 %
User Interface	24 %
.NET and other Microsoft Application Development	23 %
Mobile Development	23 %
Marketing Campaign Management	23 %
Mathematics	23 %

 Fähigkeiten, die in die Kategorie digitale Kompetenz fallen

Challenges for Implementation

- Need to distinguish between data aggregation (trends) and targeted analysis (head hunting: privacy and bias problems)
- Bias: self-selection and self-reporting
- Bias: self-employment and high-skills
- Issue of public – private partnerships (does the public sector promote these platforms through working with them?)
- But through engagement public sector and especially ministry of labour / federal employment agency can learn!



MILLA bildet ein neues Fundament für **Weiterbildung** und für die **Erfassung von Kompetenzen**

1 Neues **Online-Angebot**



2 Koordination & Empfehlung
von **Offline-Angeboten**



3 Erfassung von
Kompetenzen



4 Neues **Berufsnetzwerk**
für alle



MILLA

Modulares Interaktives Lebensbegleitendes Lernen für Alle

Thank you! Let's discuss!

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