

THE PATH TO AI & DATA DRIVEN STRATEGY FOR



IMT 580 Final Group Presentation

Group 1 -
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- For years, LinkedIn has been at the cutting edge of AI and data, which have become its core differentiating competencies.
- Data products of LinkedIn include but are not limited to skill endorsement, news feed, and personalized recommendation. With explainable AI system, LinkedIn is helping the sales team to trust AI and identify the best solutions.
- Bias, stereotypes, and discriminations are deep-rooted problems brought by algorithms. At the same time, LinkedIn seems to care less about the underprivileged employees.
- From audio/video integration and the AI Academy, we see the growing opportunities for LinkedIn in the next 5 years.
- Data security, misinformation, political governance, and malicious contents are common threats for tech companies including LinkedIn.
- We have made two major recommendations for LinkedIn that concerns inclusiveness and tackling bias in AI.

EXECUTIVE SUMMARY

TABLE OF CONTENTS



- Overview
- Strengths powered by AI and Data analytics
- Problem Analysis
- Future Scope of LinkedIn
- Threats to be addressed
- Recommendations



OVERVIEW

Brief introduction of the organization

OVERVIEW

LAUNCHED IN 2002

Social networking platform specifically for the business community

JOB POSTINGS

Employers publish job postings and search for potential candidates

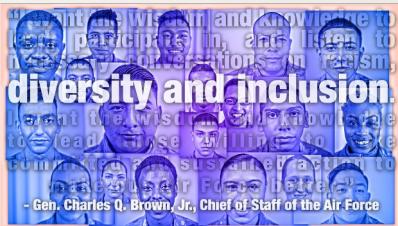
PROFESSIONAL NETWORKING

Users create profiles, in which they summarize their careers, skills, and employment history.

LINKEDIN LEARNING

A platform for online learning that enables users to gain skills to advance their careers

SHARED VALUES AND VISION



Diversity, inclusion and belonging

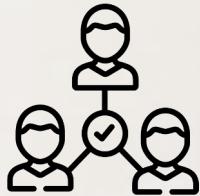


Prioritizing people

Honest and constructive learning

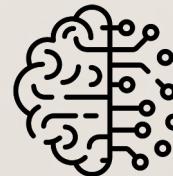


WHY THIS TOPIC?



FAMILIARITY WITH LINKEDIN

- Regular users of LinkedIn
- Networking, internship/job search, and learning new skills



AI/DATA SCIENCE

- Cutting edge uses of AI
- Opportunity for strategic learning
- Explore practical Data Science applications.

OUR SCOPE

We examine two in-depth case studies that show how LinkedIn leverages AI to grow.

RECOMMENDATION SYSTEMS

Transparent, responsible and explainable systems for matching candidates with jobs, and vice versa

DATA & ANALYTICS

Data products used at LinkedIn such as news feed updates and LinkedIn Knowledge Graphs to analyze member data

STRATEGIC LEADERSHIP CAPABILITIES OF LINKEDIN

DYNAMIC CORE COMPETENCIES

AI & big data analytics are core differentiating competencies of LinkedIn

EMPHASIZE HUMAN CAPITAL

LinkedIn prioritizes their employees' productivity and success across all kinds of decision-making.

"We believe that the potential for positive strategic leadership not only exists, but is indeed the way forward."

— MICHAEL A. HITT
STRATEGIC LEADERSHIP FOR THE 21 CENTURY

STRATEGIC LEADERSHIP CAPABILITIES OF LINKEDIN

INVEST IN THE DEVELOPMENT OF NEW TECHNOLOGIES

Linkedin invests heavily in developing disruptive tech such as explainable AI and knowledge graphs

DEVELOP AND COMMUNICATE A VISION

Linkedin's Vision : Create economic opportunity for every member of the global workforce

"Due in part to the new global competitive landscape and the enhanced competition that most companies face, firms must be more innovative and entrepreneurial."

- MICHAEL A. HITT
STRATEGIC LEADERSHIP FOR THE 21ST CENTURY

01

STRENGTHS

Data and AI power
everything in LinkedIn

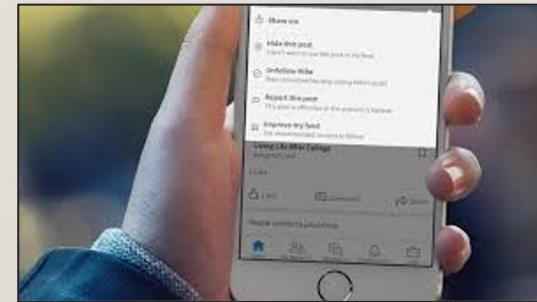
#1 DATA & ANALYTICS

Data Products used at LinkedIn :



Skill endorsements:

Data gathering and analytics are used to extract expertise based right candidates



News feed updates:

Uses ML algorithms of Hadoop for new and relevant updates

Data Products used at LinkedIn :



People recommendations:

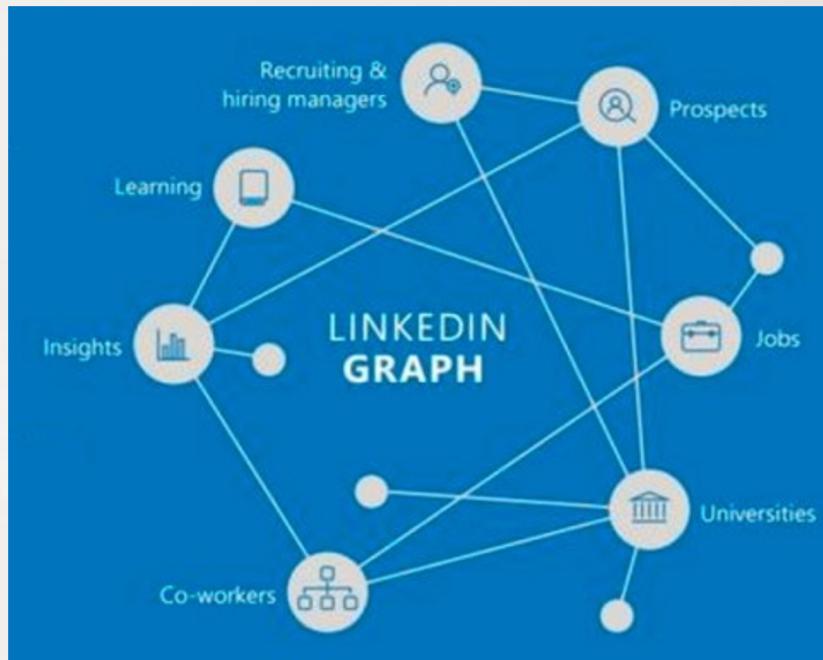
Uses Hadoop batch processing to filter online and offline data to provide recommendation to connect on LinkedIn.

Jobs you may be interested in:

Uses data to help recruiters with searchable job titles and skill sets.

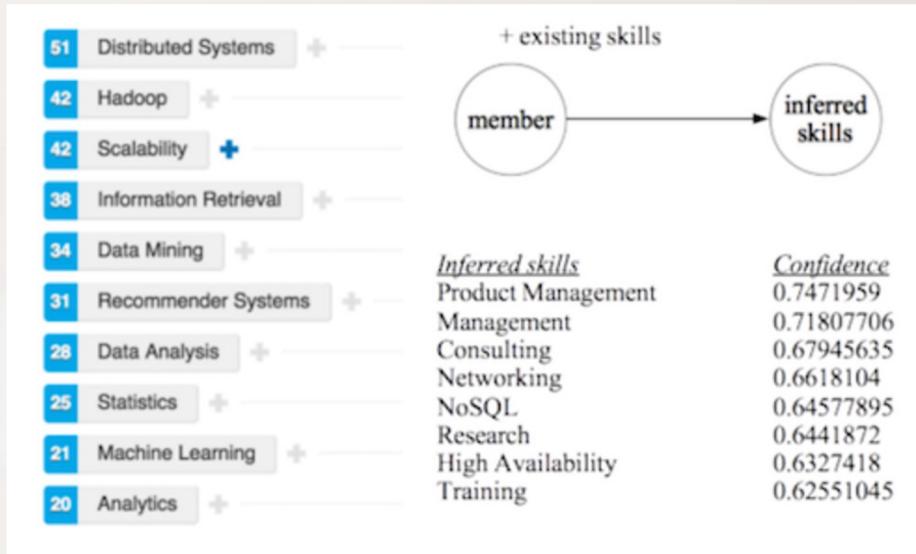


LinkedIn Knowledge Graph to analyze member data :



LKG is a large knowledge base that uses entities like members, jobs, titles, skills, companies, locations, schools etc.

LinkedIn Knowledge Graph to analyze member data :



Data and ML models are used to help with features like ranking search results, ads and updates in news feed to enhance monetization, business and consumer analytics.

#2 ARTIFICIAL INTELLIGENCE

Explainable AI (XAI)



HOW

How a model is trained and evaluated



WHAT

What inputs go into the model



WHERE

Where are the decision boundaries of the model



WHY

Why a specific prediction are made by the model

CASE STUDY

AI-driven recommendation system to help scale sales efficiency across LinkedIn

Key question:

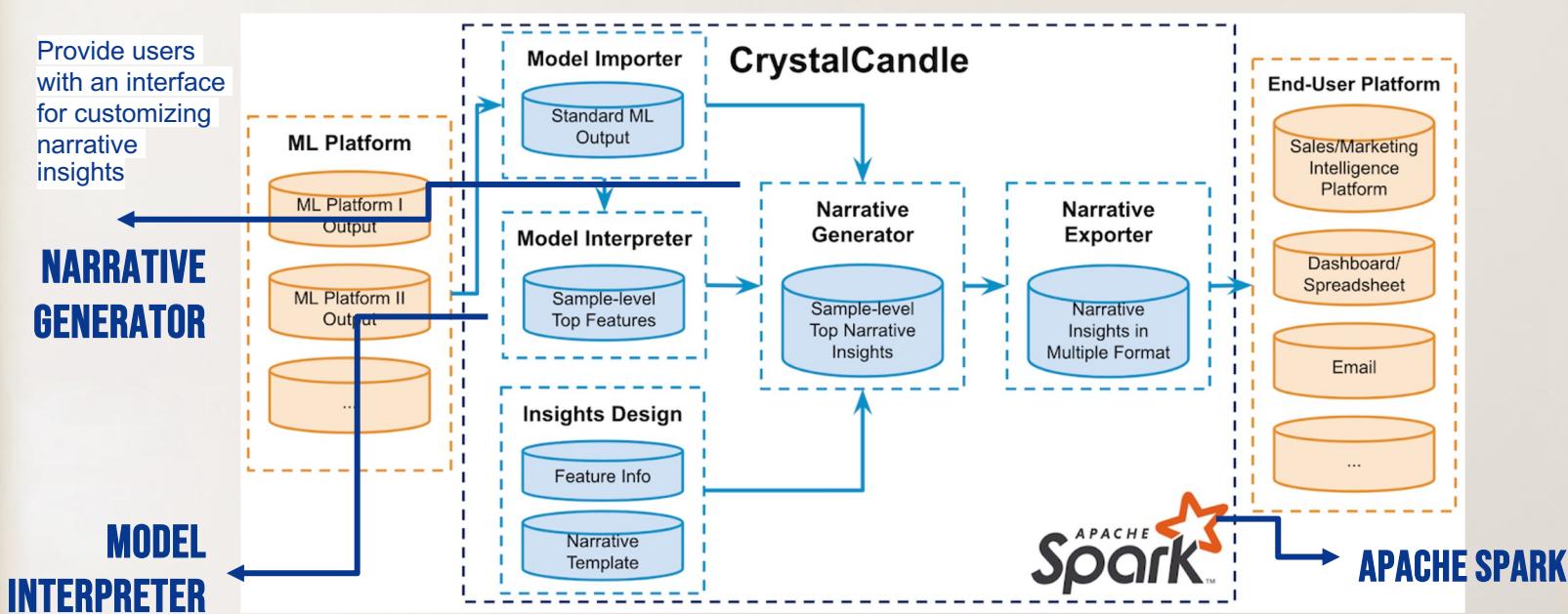
How can AI help the sales team effectively identify the best LinkedIn solutions to fit customers' needs in a scalable and accurate manner?

Solution:

CrystalCandle



CrystalCandle: a user-facing model explainer



Provide users with an interface for customizing narrative insights

NARRATIVE GENERATOR

Generate important feature list and provide users with an interface for implementing model interpretation approaches

The entire CrystalCandle is built on Apache Spark to achieve high computational efficiency

APACHE SPARK

The output of CrystalCandle

This account is very likely to upsell. Its likelihood is driven by:

1. In the past 12 months, there are a total of 240 new hire(s) including 38 Director(s) and 7 VP(s), across 18 different functions, including 15 new hire(s) in HR function.
2. In the past 12 months, 113 employees left the company which spanned across 18 functions, including 29 Director(s) and 2 VP(s).
3. Inmail response rate in the last month changed from 13% to 32% (+146%).
4. Monthly LCP viewers in the last 3 months changed from 88 to 116 (+32%).
5. Monthly LRI in the last 3 months changed from 28 to 35 (+25%).

The output of CrystalCandle is a list of top narrative insights for each customer account, which reflects the rationale behind the ML-model provided scores.

02

WEAKNESSES

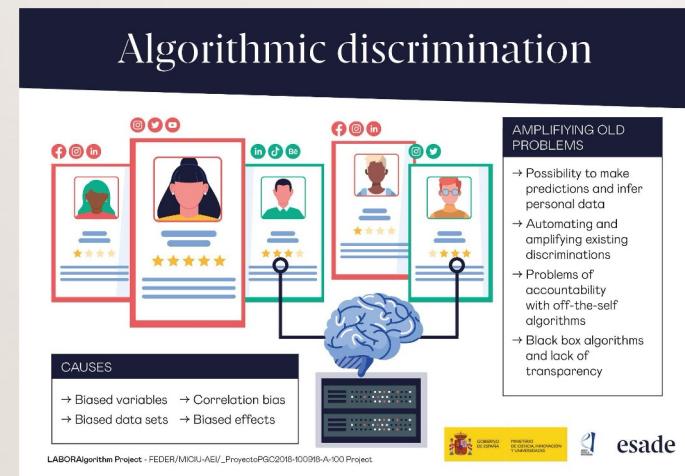
What problems does
LinkedIn face?

BIAS, STEREOTYPES, DISCRIMINATION IN ALGORITHMS

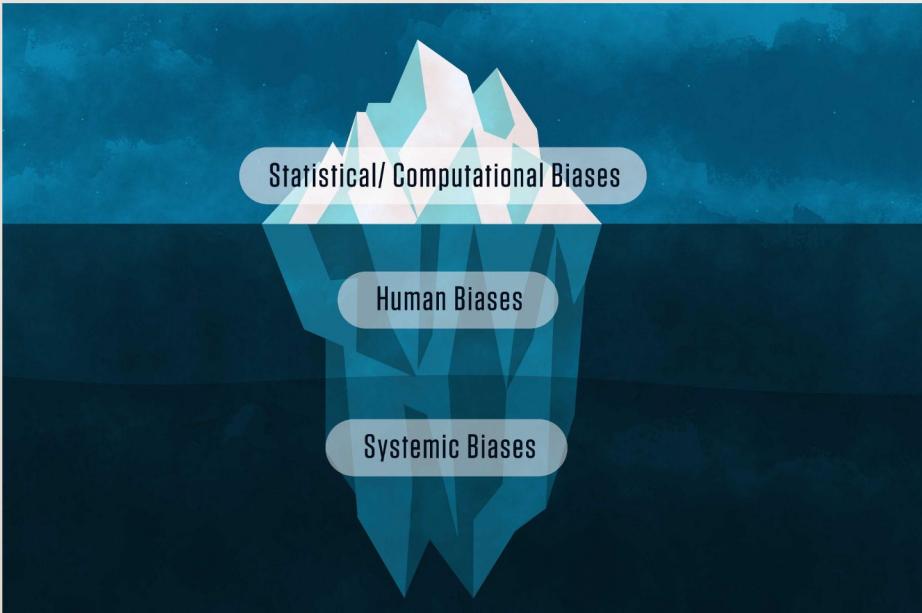
You are defined by algorithms:

- Qualifications
- Skills
- Experiences

Algorithms are all about **optimization**.
What problems can this bring about?



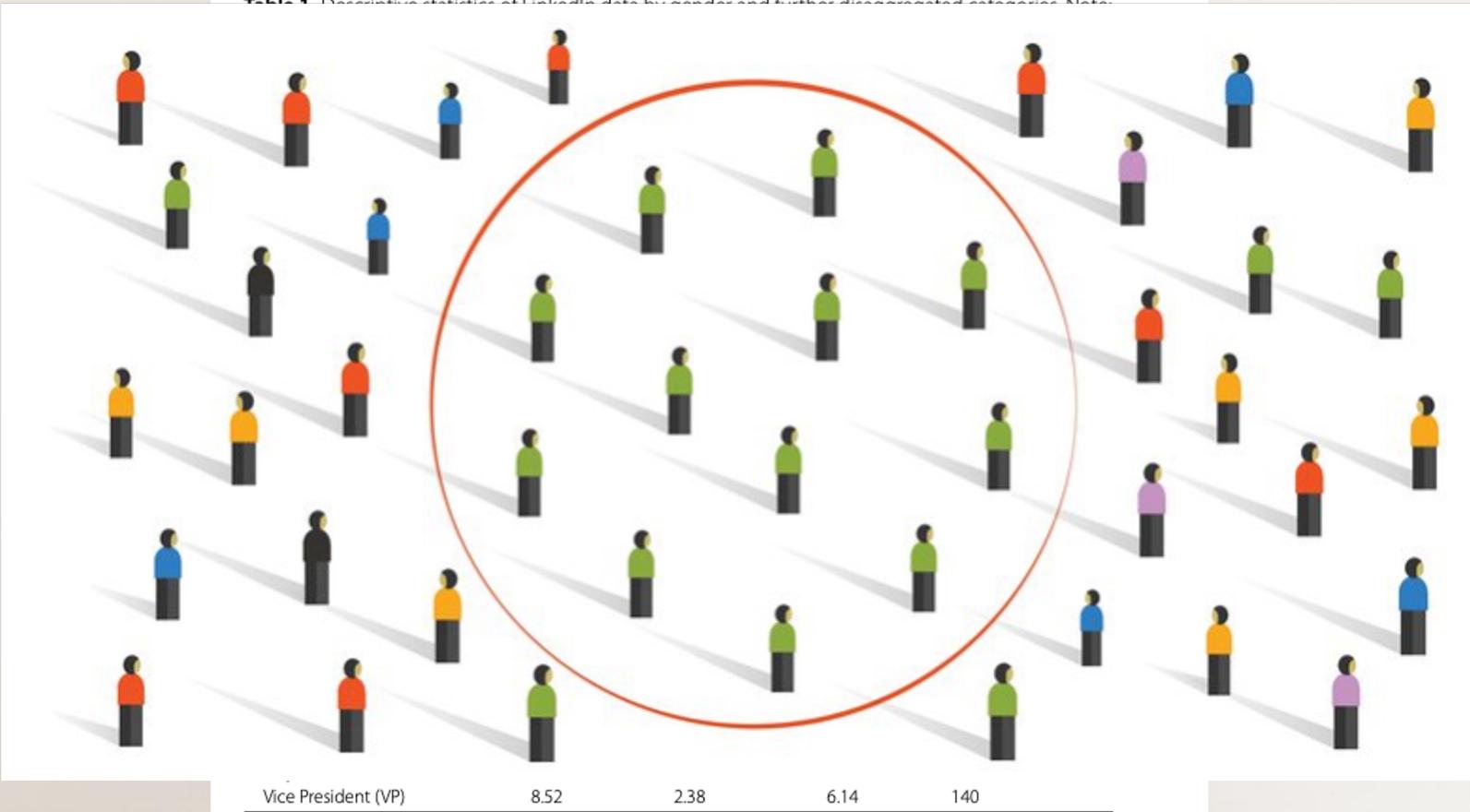
BIAS IN ARTIFICIAL INTELLIGENCE



AI looks for patterns, statistical data and trends. This can lead to bias when pervasive societal and cultural inequality impact that data.

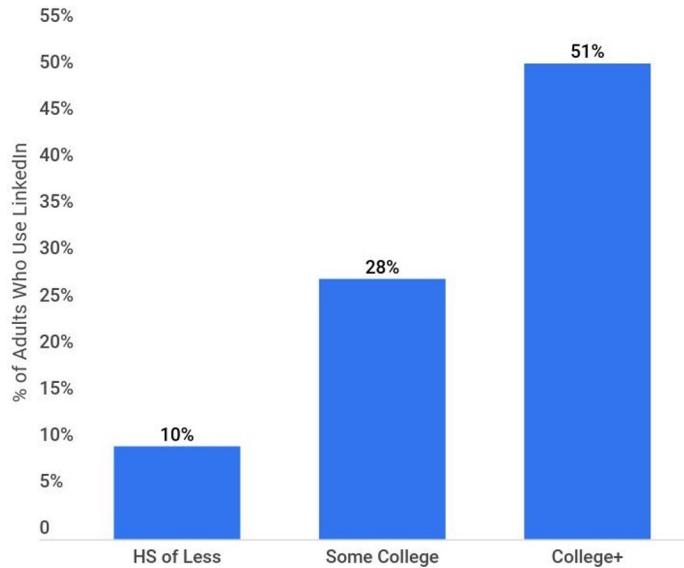
Case: recommendation systems

Table 1. Descriptive statistics of LinkedIn data by gender and further disseminated categories. Note:

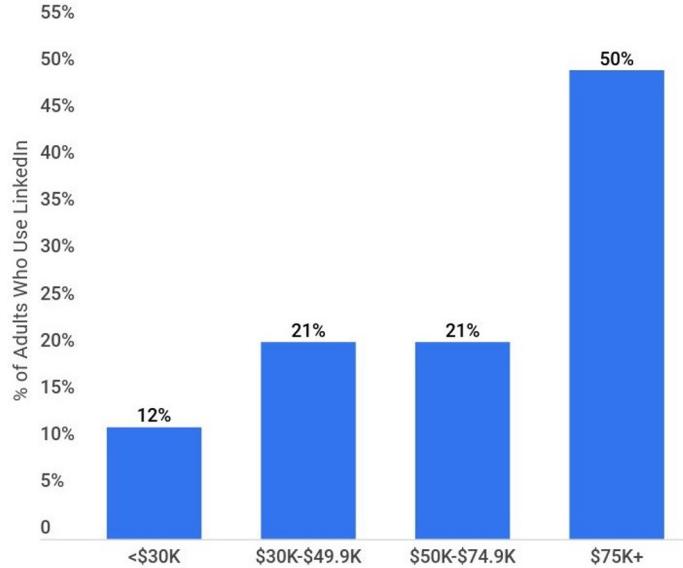


LABOR GAP

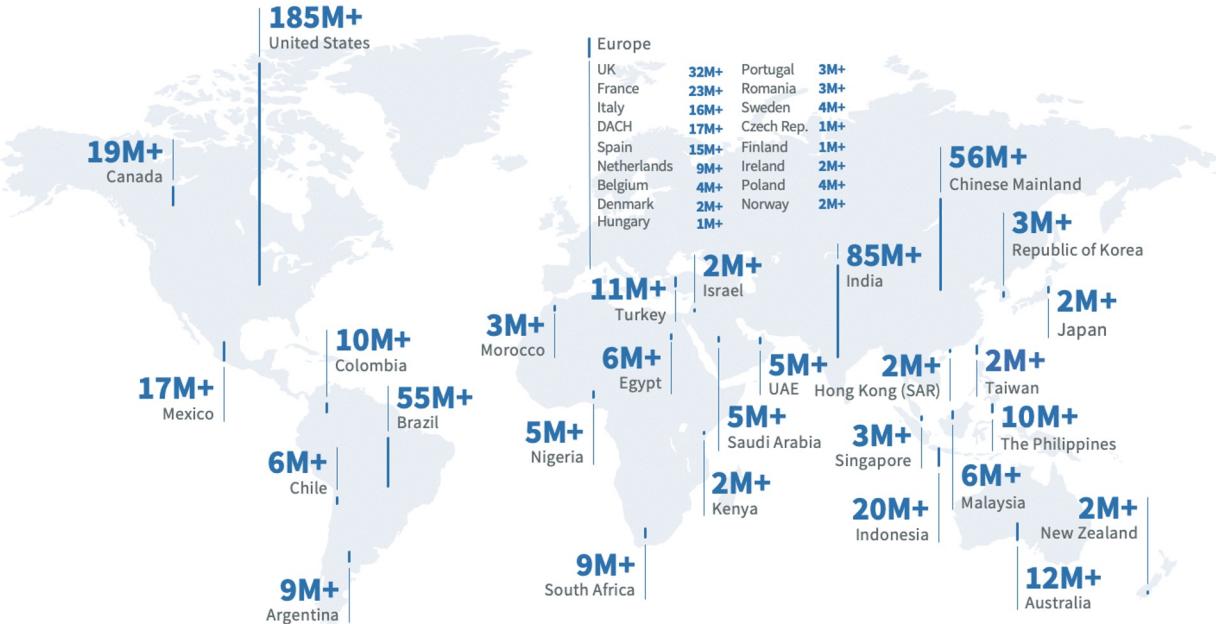
U.S. LINKEDIN USE BY EDUCATION LEVEL



U.S. LINKEDIN USE BY INCOME



810M members in 200 countries and regions worldwide*



*Membership numbers are updated quarterly after Microsoft Earnings

SOCIAL RESPONSIBILITY: IS LINKEDIN HELPFUL FOR THE LESS PRIVILEGED?

A possible active LinkedIn member:

- Advanced Degrees
- Developed Countries
- Middle-Class Families

Business impact ?

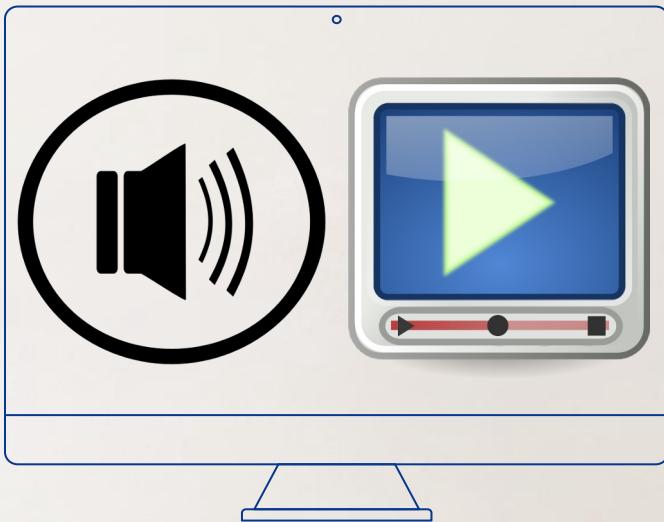


03

OPPORTUNITIES

What LinkedIn can do in
next 5 years?

AUDIO/VIDEO INTEGRATION



AI systems can learn from the content shared over audio/video

GOAL: Build ML model to identify and store keywords and skill requirements asked in an interview to help map other job seekers with the right job roles

LINKEDIN AI ACADEMY

AI Academy Goals:

- Scaling as an organization
- Understanding of machine learning

Bolster internal AI skills for human capital

GOAL: to equip employees across the company—in areas like engineering, product management, etc.—with the knowledge they need to optimally deliver impactful AI experiences to all members.

04

THREATS

What challenges does
LinkedIn currently needs to
address?

CHALLENGES

- **Data security:**
Frauds, scams, phishing, data leakage
- **Misinformation:**
Fake profiles



CHALLENGES

- **Political governance:**

Banned or strictly regulated in some countries

- **Malicious content:**

Abuses, discrimination, racism, terrorism



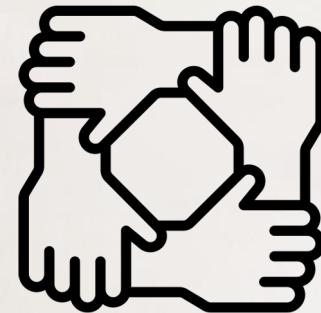
05

RECOMMENDATIONS

For a better future for
LinkedIn

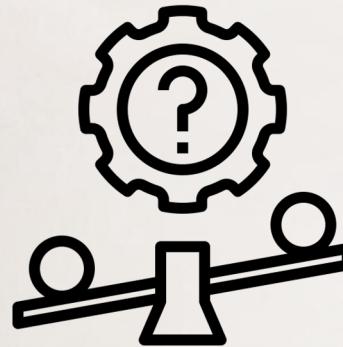
MAKING LINKEDIN MORE INCLUSIVE

- Separate keyword tag that help distinguish blue-collared and white-collared jobs on the platform.
- Establishing a minimum pay scale criteria on job postings to eliminate labor exploitation.
- Creating a platform for underskilled workers to be mentored by skilled professionals, enabling them to enhance their expertise and interview skills.



TACKLING BIAS IN AI

- Setting different decision thresholds for different groups of users
- Establish processes and practices to test for and mitigate bias in AI systems
- Before executing an algorithm, developers should make initial assumptions about its purpose and account for biases where appropriate.



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THANKS!

DO YOU HAVE ANY QUESTIONS?



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