



Amazon Web Services (AWS)

Transforming Education & Research through AI Services – Assets – Frame Agreement

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November 1st 2024

Agenda

Who is AWS and **Why** we're here

What :

- AWS for Higher Education
- AWS for Research
- AI role in Education & Research

How Frame Agreements are enabling Cloud transformation and AI adoption

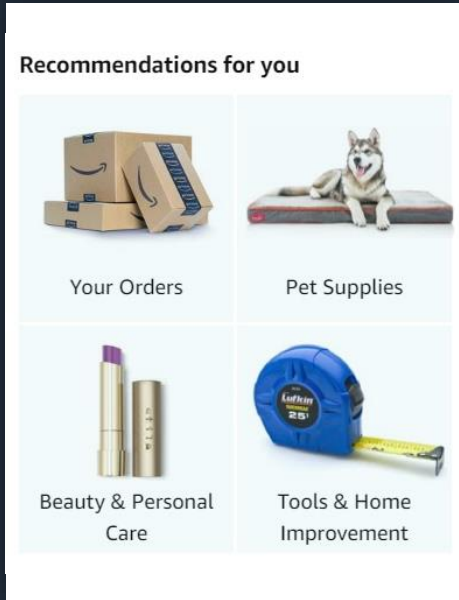




is the cloud computing arm
of



AWS innovation is in Amazon's DNA



**4,000 products
per minute** sold
on Amazon.com



1.6M packages
every day



Billions of Alexa
interactions each week



Just Walk Out
technology in airports,
stadiums and more



Some data points about AWS

EXPERIENCE

18 years

helping millions
of customers

GLOBAL REACH

33 Regions

spanning 105
Availability Zones and over 140
Direct Connect locations

SECURITY

300+

security features

INNOVATION

200+

service offerings

AWS INFRASTRUCTURE

3.6x+

energy efficient than the median
of surveyed U.S. enterprise data
centers

TCO

134

price reductions
since 2006

ECOSYSTEM

12,000

software listings from
2,000 ISVs



Source: AWS Approved Public Stats
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WHAT is Education ?

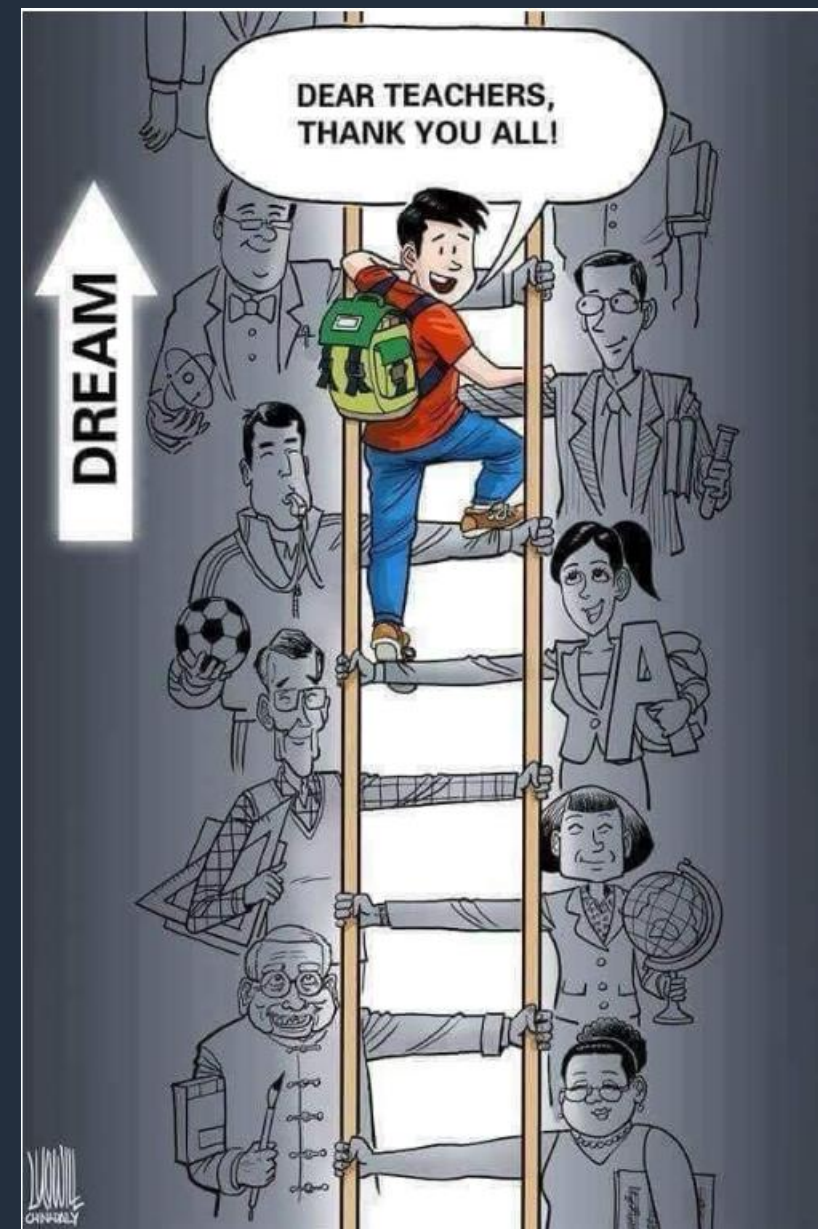
Education : latin *educere* 'to take out, extract', derived from *ducere* 'to drive', with the prefix e- indicating movement outwards.

WHY are we Educating ?

To allow the largest number of young individuals to interact positively with the human and social environment in which they live and generate positive impact.

WHO are we educating ?

Student : from latin verb *studeo*, *student* is person that apply, study



LEARNIFICATION or critical/abstract thinking ?

Putting the *student* at the center, requires that Education institutions adapts to rapid change and considering external factors impact



Acceleration in adoption of “new” online learning and AI support

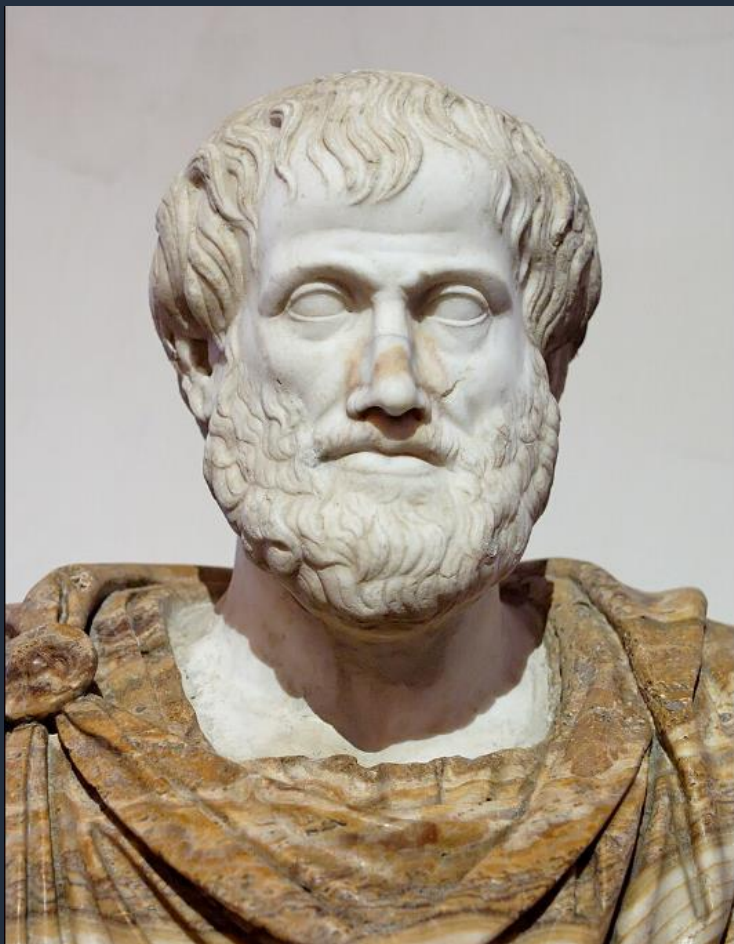


Competition from MooCs, microdegrees, and changing views about traditional education pathways



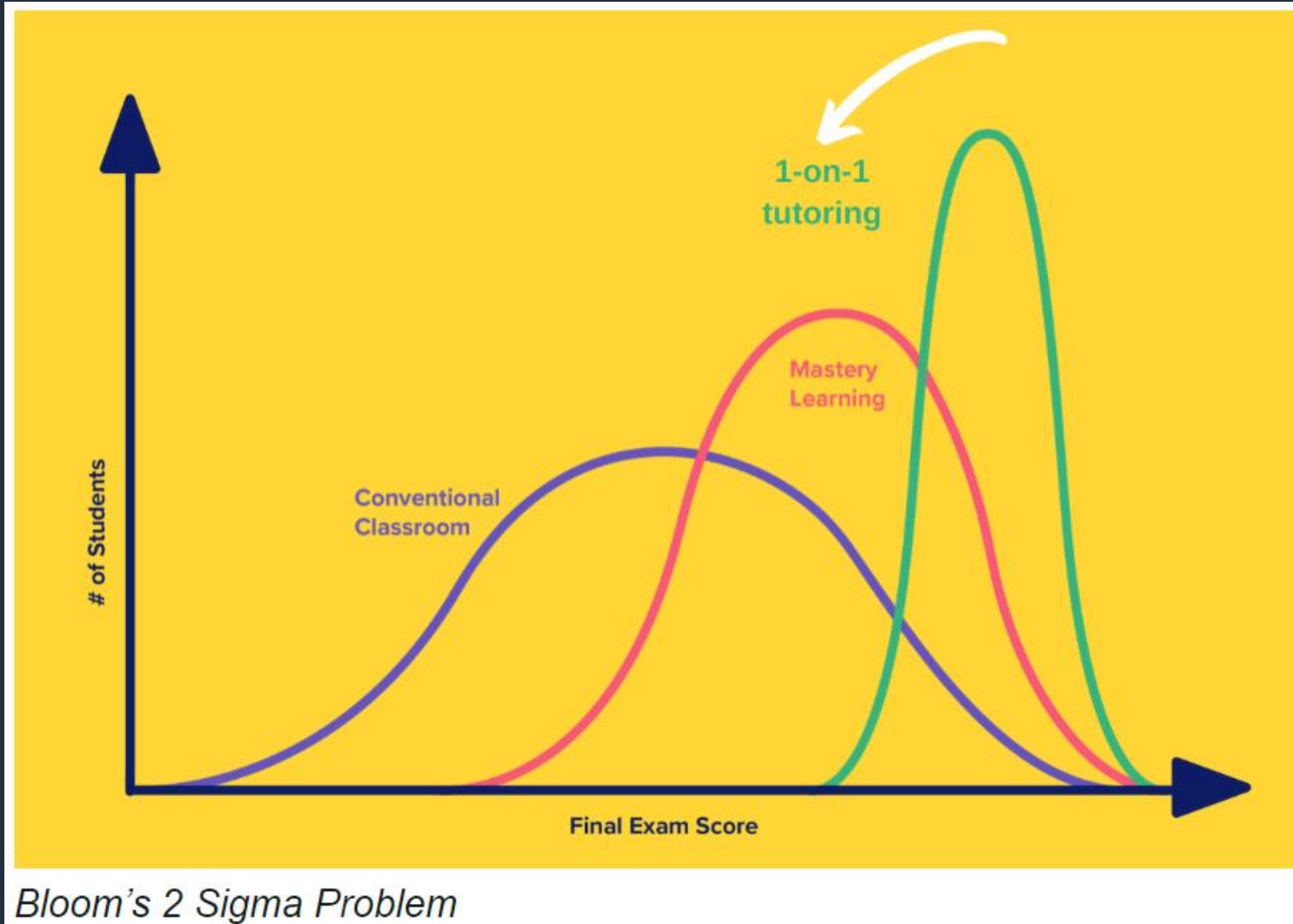
Financial pressures and fiscal constraints requiring innovative solutions

Aristotele, Alexander the Great, Lyceum



One Aristotele for each student ?

Bloom's 2 Sigma problem



Though Bloom concluded that one-to-one tutoring is "too costly for most societies to bear on a large scale"

Generations Z and Alpha

Generations Explained:	
GREATEST GEN:	people born between 1901 and 1927
SILENT GEN:	people born between 1928 and 1945
BABY BOOMERS:	people born between 1946 and 1964
GEN X:	people born between 1965 and 1980
MILLENNIALS:	people born between 1981 and 1996
GEN Z:	people born between 1997 and 2012
GEN ALPHA:	people born between 2013 and present

GEN Z:

Digital integrators , global, connected, technology influenced

Visual (wactching vs reading) .

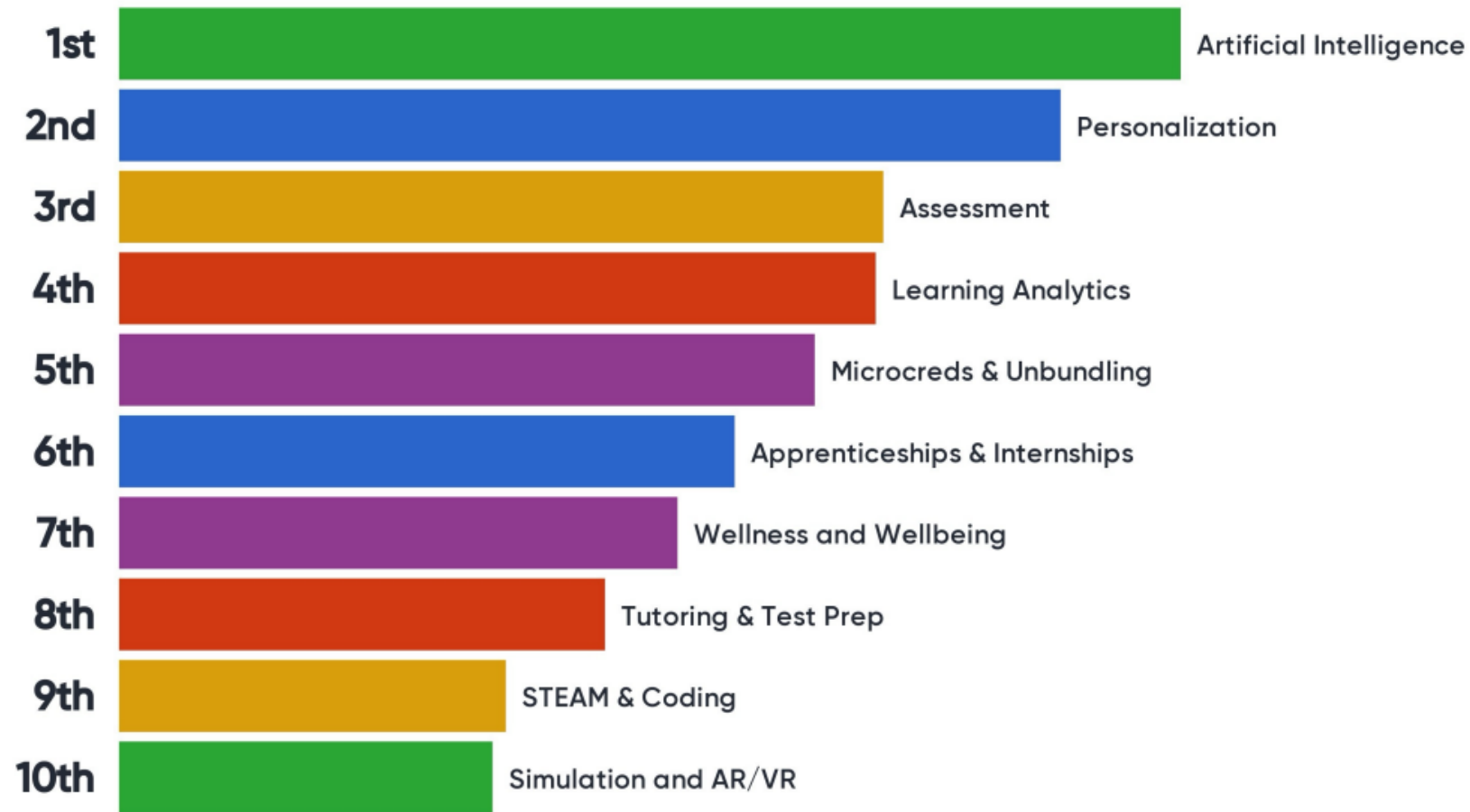
As per 2024, 23% of population, in 10Y 31% of workers including teaching

GEN ALPHA:

Digital native, *Screenager (iPad launched in 2011)*, 2.8M born every week, 2B people by 2025, longer education, 50% are expected to earn university grade. Access to information about anything

2024 - HolonIQ trends in Education

Top 10 Trends in Education



Source: HolonIQ Back to School Summit survey of CEOs and Education Leaders. Choices based on interviews conducted in lead up to Summit.

AWS Focus Topics in Higher Education & Research



The next generation of Campus
Help universities break legacy,
modernize and become more
sustainable



The Future of AI in Higher
Education
Help universities better leverage
their data and new AI
technologies to transform their
institutions.



Research &
Innovation
Support researchers and
universities throughout research
projects, ensuring organized and
managed transformation.



Frameworks & Partnerships



accenture

Deloitte.

coursera

Blackboard



INSTRUCTURE



Employers



Education &
Training Providers

AWS Tech Alliance



Government & Collaborating
Organizations

Reinventing Education & Research with generative AI *AWS is HOW*

Generative AI enables innovation and unlocks new institutional value



NEW EXPERIENCES

Create new innovative and engaging ways of interacting with your students and employees



PRODUCTIVITY

Radically improve productivity across the institution



INSIGHTS

Extract insights and clear answers from all your institutional data, enabling faster and better decisions



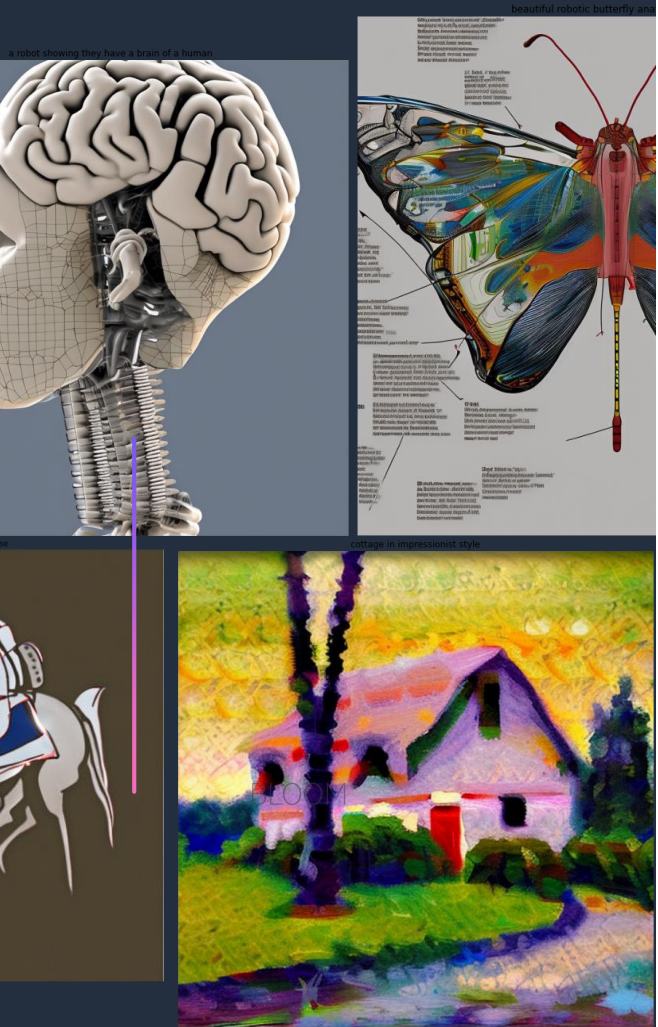
CREATIVITY

Create new content and ideas, including conversations, stories, images, videos, and music

Question: What is generative artificial intelligence (AI)?

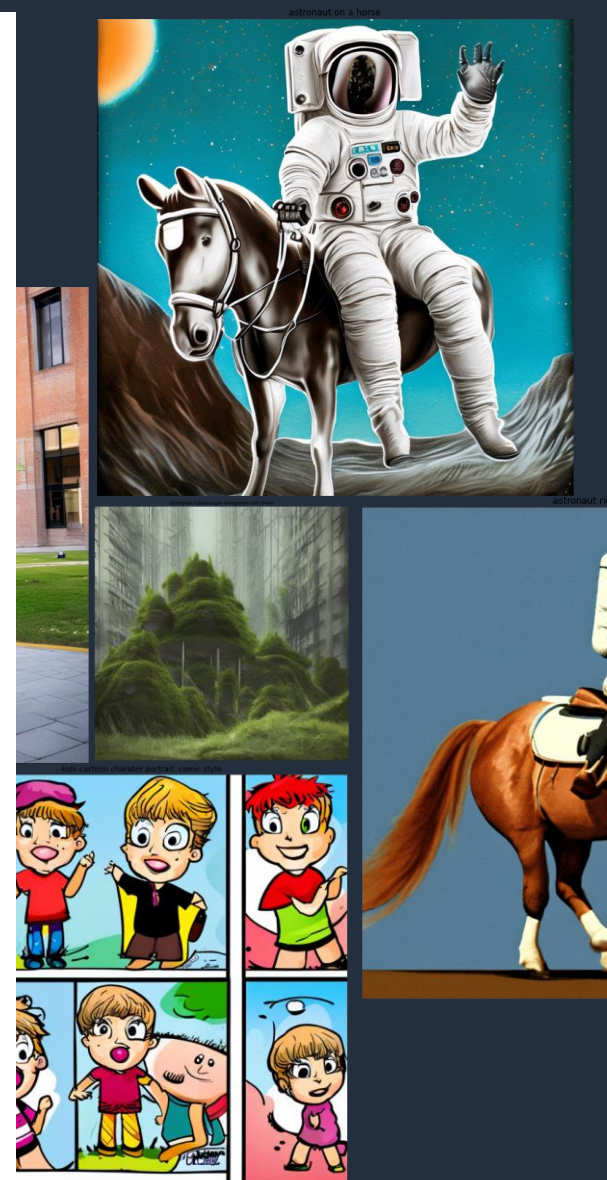
- Creates new content and ideas, including conversations, stories, images, videos, and music
- Powered by large models that are pretrained on vast corpora of data and commonly referred to as foundation models (FMs)
- AI is a TASKS replacement, not a process replacement

Summer quiz guru or
Critical Thinking

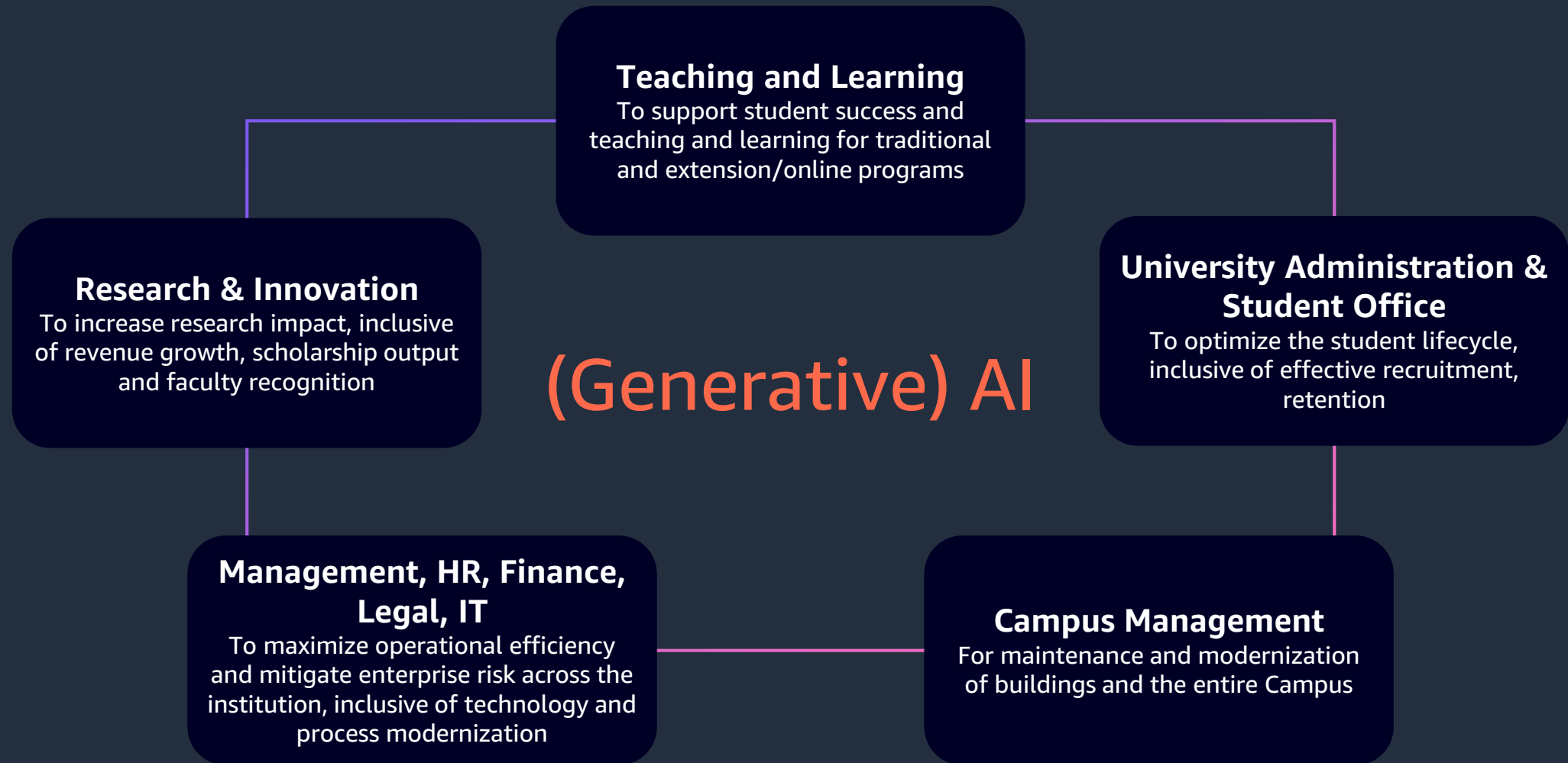


SARU MO KI KARA OCHIRU

猿も木から落ちる



Artificial Intelligence in Higher Education & Research



AI in Teaching and Learning

To maximize student success, and teaching and learning for traditional and extension/online programs



Personalized tutors, text summarization, and question generation

Capabilities like automated grading and real-time feedback

Improve Student Success

Unique learning environments for each student

AWS services & solutions:



Amazon Bedrock



Amazon SageMaker



Amazon Personalize



AI Lecture*

(Lecture support, Personal Assistant, Assessment)



AWS partner & partner solutions:

coursera

ODILO

EnlightenAI

global alumni



INSTRUCTURE

LearnUpon

Noodle Factory

studyportals



AI to drive Research & Innovation

To increase research impact, inclusive of revenue growth, scholarship output, and faculty recognition

Data analysis & pattern recognition:
analyses massive datasets to uncover hidden patterns



Natural language processing:
Used to analyse text, summarise papers, detect sentiment

Computer vision:
Analyses medical images, microscopy, environmental data

Physics Modelling:
speed up complex simulations
- learning patterns and approximating solutions

Drug discovery:
AI predicts drug interactions and designs new candidates
Robotics & lab automation

AWS services & solutions:



Amazon Bedrock



Amazon SageMaker



Amazon Rekognition



Amazon Comprehend



AWS HealthLake



AWS HealthOmics



AWS Robomaker



AWS partner & partner solutions:



Exscientia



John Snow LABS



WittGenBiotechnologies



AI in University Administration & Student Office

To optimize the student lifecycle, inclusive of effective recruitment, retention



Intelligent document
processing and chatbots

Marketing & sales:
Personalized marketing,
accelerate admissions and aid
decisions

Employee assistant:
value of faster processing and
staff capacity

Student Analytics:
analytics can optimize student
journeys

AWS services & solutions:



Amazon QuickSight



Amazon Comprehend



Amazon Personalize



AI Lecture*

(Lecture support, Personal Assistant,
Assessment)



Amazon Textract



Amazon Lex



Amazon Q



AWS partner & partner solutions:



AI for Campus Management

To optimize maintenance and modernization of building and the entire campus



Operational Efficiency:

Transform complex data into easy-to-understand visualizations and recommendations

Energy Management:

Adjusts energy use based on building behavior, occupancy rates, and environmental conditions.

Predictive Maintenance:

Pre-emptive actions to optimize building system lifecycles, minimizing costs and downtime

Space Utilization:

Analyze space usage patterns, improving productivity and occupant satisfaction

AWS services & solutions:



Amazon Quicksight



Amazon Q



AWS IoT Greengrass ML Inference



AWS partner & partner solutions:



ARIA

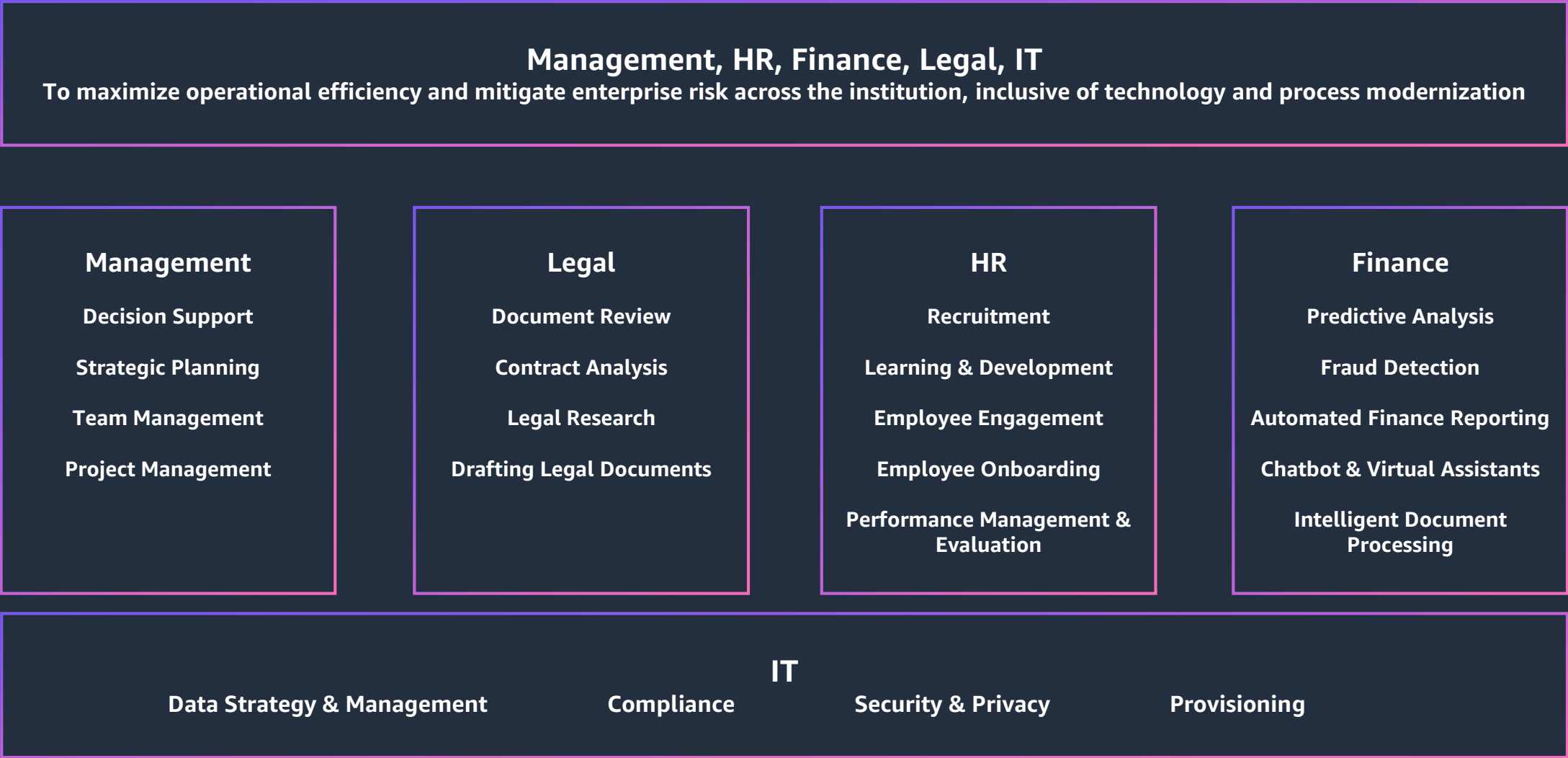
BRAINBOX



enerbrain®



AI in Management, HR, Finance, Legal, IT



AI in HR operations for academic institutions

To optimize Recruitment, Learning & Development, Employee Engagement, Employee Onboarding or Performance, Management & Evaluation



Recruitment & Talent Acquisition:
Analyze resumes and applications

Employee Onboarding & Training:
Personalized learning paths

Employee Engagement:
Set up an employee helpdesk for HR-related inquiries and support.

Performance, Management & Evaluation:
Extract data from performance review for analysis

AWS services & solutions:



Amazon QuickSight



Amazon Comprehend



Amazon Bedrock



Amazon Recognition



Amazon Textract



Amazon Lex



Amazon Q



Amazon Connect



AWS partner & partner solutions:

icims®



AI to financial operations for academic institutions

To integrate Predictive Analytics, Fraud Detection, Automated Financial Reports, Chatbot & Virtual Assistants, or Intelligent Document Processing

Predictive Analytics: Optimize budgets
Identify financial risks
Identify students suitable for Financial Aid

Fraud Detection: Monitor financial transactions in real-time, detecting, flagging suspicious activities

Automated Financial Reporting: Saves time, reduces errors, and enables faster decision-making

Intelligent Document Process: Extract finance information from docs, reduce manual data entry, improve accuracy

Chatbot & Virtual Assistants: Handle routine financial queries from students, staff, and faculty



AWS services & solutions:



Amazon Forecast



Amazon SageMaker



Amazon FraudDetector



Amazon Comprehend



Amazon GuardDuty



Amazon Quicksight



Amazon Q



Amazon Connect



AWS partner & partner solutions:

Leena AI

Fraud.net



AI in Information Technology (IT)

To use the latest AI technology to stay resilient, ensure a Business Continuity of Campus and a data foundation for informed decision



Security & Privacy:
Protect data from threats & ensures responsible data use

Compliance:
Adhering to laws, regulations, and ethical guidelines

Provisioning:
IT resources for use
-
servers, networks, applications

Data Strategy & Management:
Manage, analyze, and act on data for informed decisions

AWS services & solutions:



Amazon GuardDuty



Amazon Macie



Amazon QuickSight



Amazon Code Whisperer



AWS partner & partner solutions:

denodo



Trellix

Increasing AI Knowledge in Your Organization



Upskill your
current IT talent



Help your students to
be skilled and future
ready



Activate the non-
technical talents of your
organization

Assess Current
AI Capabilities
and Maturity

Develop an AI
Upskilling and
Training
Program

Forster a
Culture of AI
Exploration and
Innovation

Partner with
External Experts
and Resources

Measure and
Iterate

AWS offers comprehensive, customized AI/ML training for every stage of your cloud journey



Skills assessment and personalized training plans

Our **Learning Needs Analysis** helps you understand where your gaps are and design a plan to target the AI and ML skills that are most important to your business goals.



Blended training with Industry-recognized credentials

Digital courses, instructor-led classes, and game-based learning meet teams' diverse training needs.

AWS Skill Builder: 100+ learning resources on AI and ML, including generative AI. Interactive challenges in a secure sandbox environment.



Education tailored programs

AWS Tech Alliance

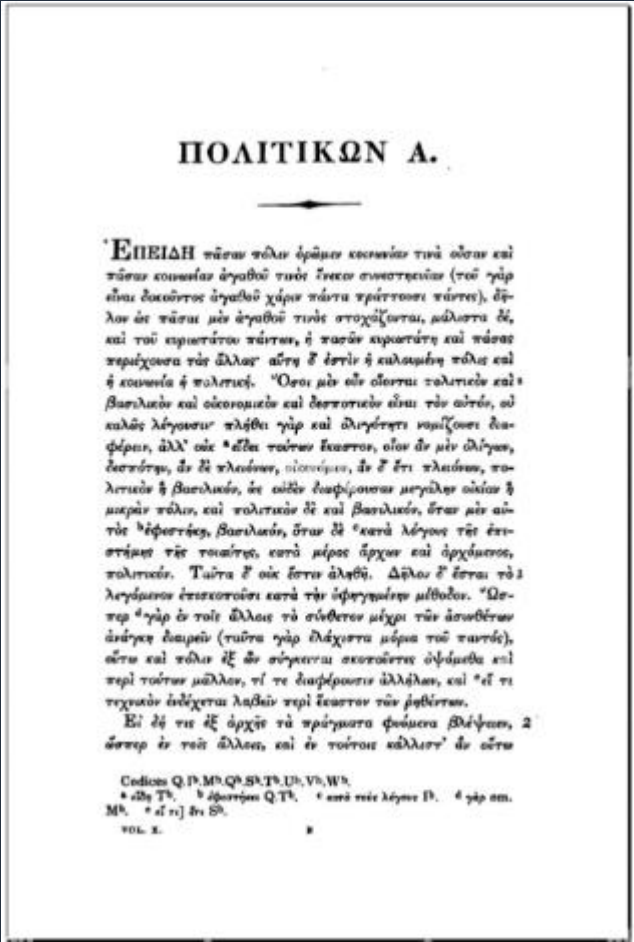
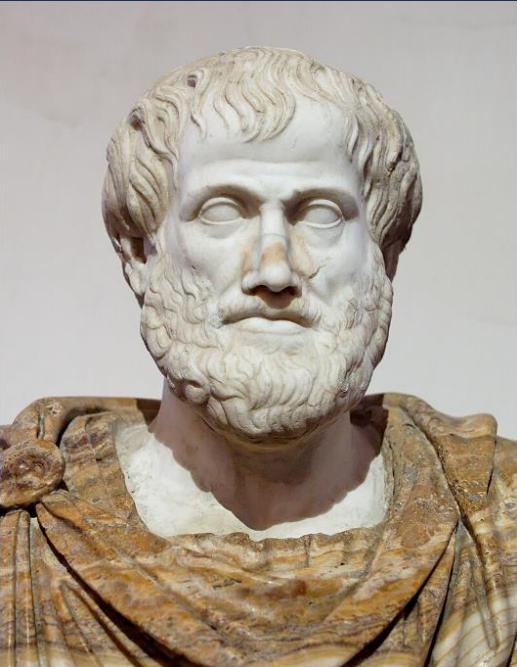
AWS Academy

AWS Educate

AWS re/Start

AWS Sandbox

From Aristotele to Moog, self playing musical instruments





AI for Lecture

AI for Lecture

A modular solution generative AI-powered tailored to your “augmented” Lecture

Provides interactive answers, solves problems, generates content, and provides insights

Adapts to your content and teaching style

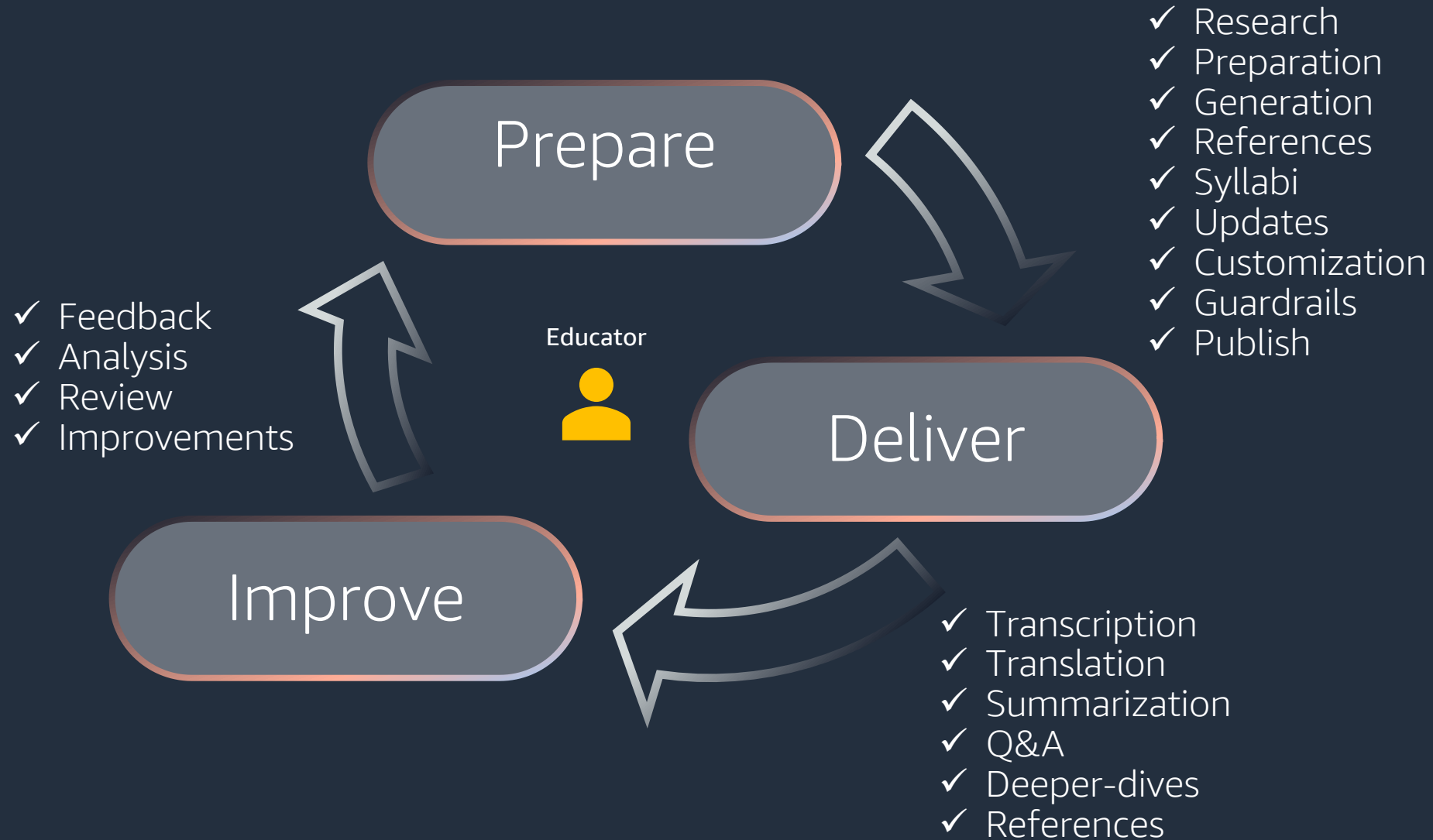
Personalizes interactions based on Educators wishes

Increases accessibility with support for diverse learners

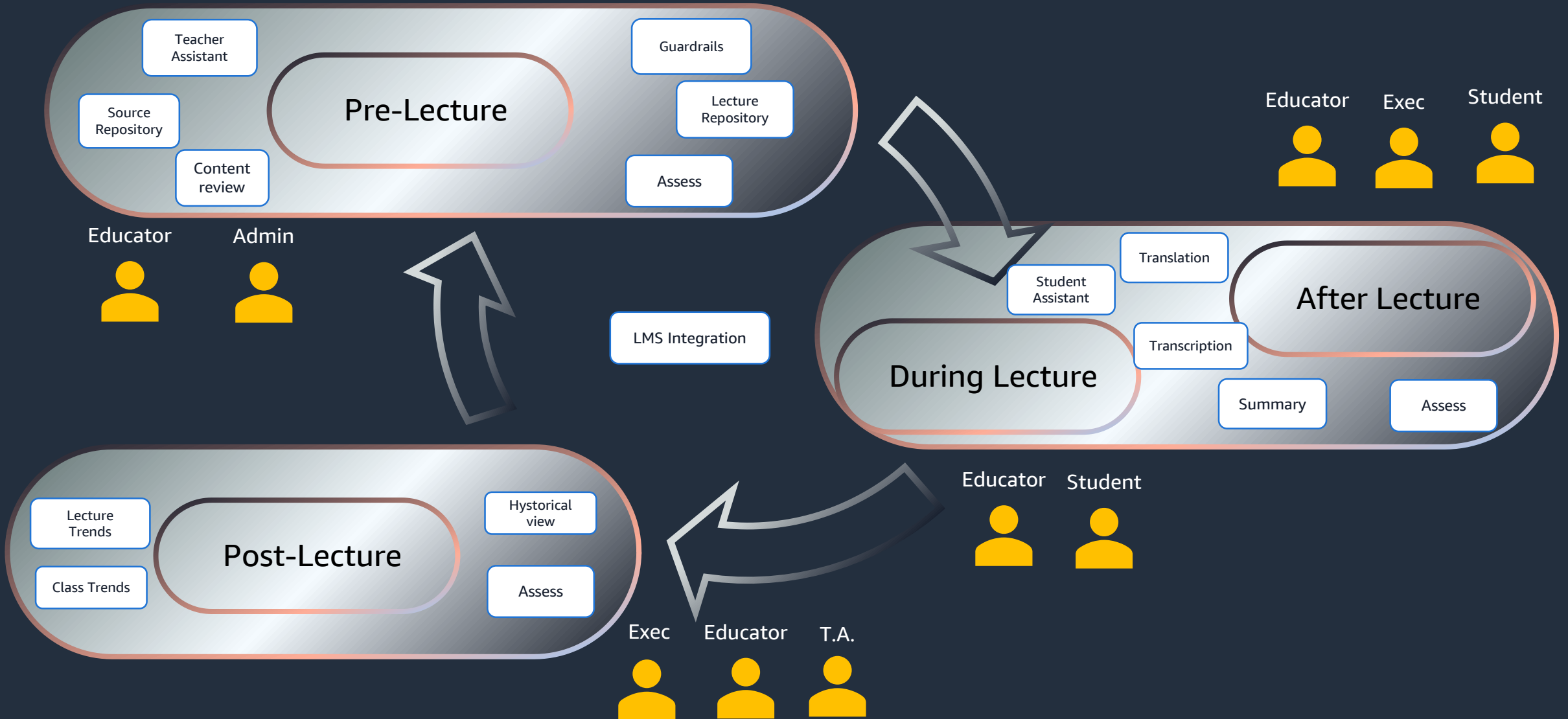
Built to be secure and private



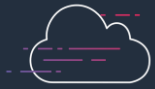
AI for Lecture, Prepare, Deliver, Improve



AI for Lecture – Modular approach



ZAMren act as AI development agent for Zambia major universities.



ZAMREN is a National Research and Education Network (NREN) that started its operation in 2012 and has grown to become one of the leading Internet Service Provider and ICT solutions for Higher Education and Public Research Institutions in Zambia. A national Research and Education Network (NREN) is a specialized ICT provider that exists in a country to provide internet and advanced ICT services to the country's research and educational institutions on a non-profit basis.



The main problem in Zambia are long distances, connectivity, polarizations, large numbers of students in limited number of universities.



ZAMren in partnership with AWS and Redington partner has launched the AI4Z (AI for Zambia) project leveraging the AI for Lecture IP from AWS.



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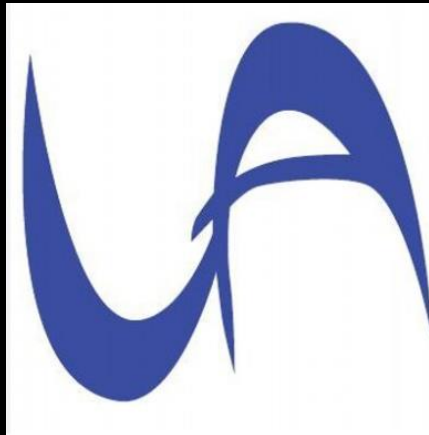
“To provide a secure, affordable and quality national digital infrastructure and services for Research and Education for social and economic development”

Prof. Stein Mkandawire

Zamren CEO



Framework agreements



What is a Framework Agreement

01

The global industry standard for how Public Sector entities procure goods and services

02

Contract signed with one entity on behalf of many affiliate entities

03

Defines terms and conditions for how purchasing is conducted and enables centralized governance for the buyers and the sellers

04

Does not guarantee any purchasing, simply creates the framework for purchasing if there is demand



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Framework Agreements | Benefits

1

Easier and speedier procurement & contracting: Ubuntunet selects the Framework vendors and negotiates terms on behalf of other government agencies. Once the Framework is implemented, there is no need to go through the contract negotiation lifecycle again.

2

Maximize Buying Power: Aggregate spending across agencies to create economies of scale, maximize discounts, and aggregate purchasing power across the entire IT budget.

Achieve cost benefits across savings plans, reserved instances, data transfer, and Amazon Simple Storage Solution (S3)

3

Data Egress Waiver: Universities and research institutions within the frame agreement will receive a data egress waiver up to 15% of the total AWS monthly bill plus free of charge data export at project completion

4

User adoption: Thousands of entities are eligible for their cloud journey on AWS through UBUNTUnet frame agreement, large teaching & learning projects, research, LLMs, ISV Marketplace



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How AWS Works with Regional and National Research & Education Networks

- Operating frameworks agreements with NRENs , entities, partners
- Enable NRENs, Partner and reseller of AWS services
- Joint communication, events, webinars.
- Cloud Professional Services and Consultancy from AWS partners
 - Cloud strategies and roadmaps
 - Cloud TCO, architecture reviews
 - Security
 - Best practice sharing
- Help NRENs to build “Cloud Center of Excellence”: Certified cloud consultants, solutions architects, security specialists & engineers
- Pricing, billing management, cost optimization & management, promotional credits
- Security & compliance – verification of cloud services.
- Community support : training, certification and events



SURF Research Cloud brings data power to science using AWS



SURF—the National Research and Education Network (NREN) in the Netherlands—wanted to create a secure, reliable research and data sharing platform that would be compliant with data privacy laws across international borders and offer different levels of access.



It used Amazon EC2 for secure, resizable compute power and AWS Control Tower to set up and govern secure, multi-account AWS environments with different levels of access and functionality that would also be GDPR compliant.



The SURF Research Cloud provides security and GDPR compliance without compromising mobility of data. It supports multi-region networks and offers multiple interfaces that allow researchers to select the right system for their work using mature and stable AWS services.



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“Success isn’t just a question of technology. It can’t happen without compliance, which is a dimension that researchers often struggle with. We overcame that by using cloud native technologies from AWS.”

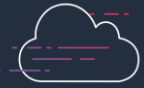
Ivar Janmaat

Team Lead, High Performance
Compute Cloud, SURF

SURF

GRnet brings AWS cloud to the country using AWS through OCRE

GRNET (National Infrastructures for Research and Technology) - The national research and education network (NREN) at Greece - wanted to enable fast and reliable access to cloud resources to over 70 institutions that operate on a decentralised research model. international borders and offer different levels of access.



The main problem at Greece is the research model is not centralized, each institution might have 10+ projects with different stakeholders and owners who are not governed by the institution leadership directly.



This solves that issue and gives them cloud access within 5-10 days regardless of budget



Model provides, user activation/deactivation, budget allocation, consumption control, chargeback, limits control, reporting. All in a fully GDPR compliant Greece is developing 2 LLMs (Ancient and Modern Greek)



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“Focusing on Government, Education, Research, Health, Culture, we are scaling at country level, simplifying process, providing unlimited capabilities in a hybrid model while keeping control”

Prof. Panos Louridas

Grnet senior member. Professor at the Athens University of Economics and Business.





Next steps



Thank you!

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