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Understanding Generative AI in Higher Education

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CONTENTS

INTRODUCTION TO GENERATIVE AI (GenAI)

GenAI Definition

- A form of AI that utilises **Machine Learning models**
- **to create new, original content** e.g. images, text, video or music
- **based on patterns and structures learned** from existing data

(Source: Cornell Center for Teaching Innovation)

Techniques and Framework

- Deep learning
- Transformer models
- Generative Adversarial Networks (GANs)

How GenAI Works?

HOW DO AI IMAGE GENERATORS WORK?

Dataset

1.Dataset Collection

The first step involves compiling a large and diverse dataset of images.

Training (ML)

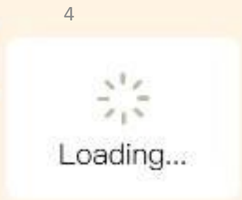
2.Training the AI Image Generator

The developers will then train the AI image generator using machine learning (ML) algorithms, specifically neural networks.

Generate (often in response to prompts)

3.Generating New Images

The AI image generator can create new AI images based on the input parameters or conditions.



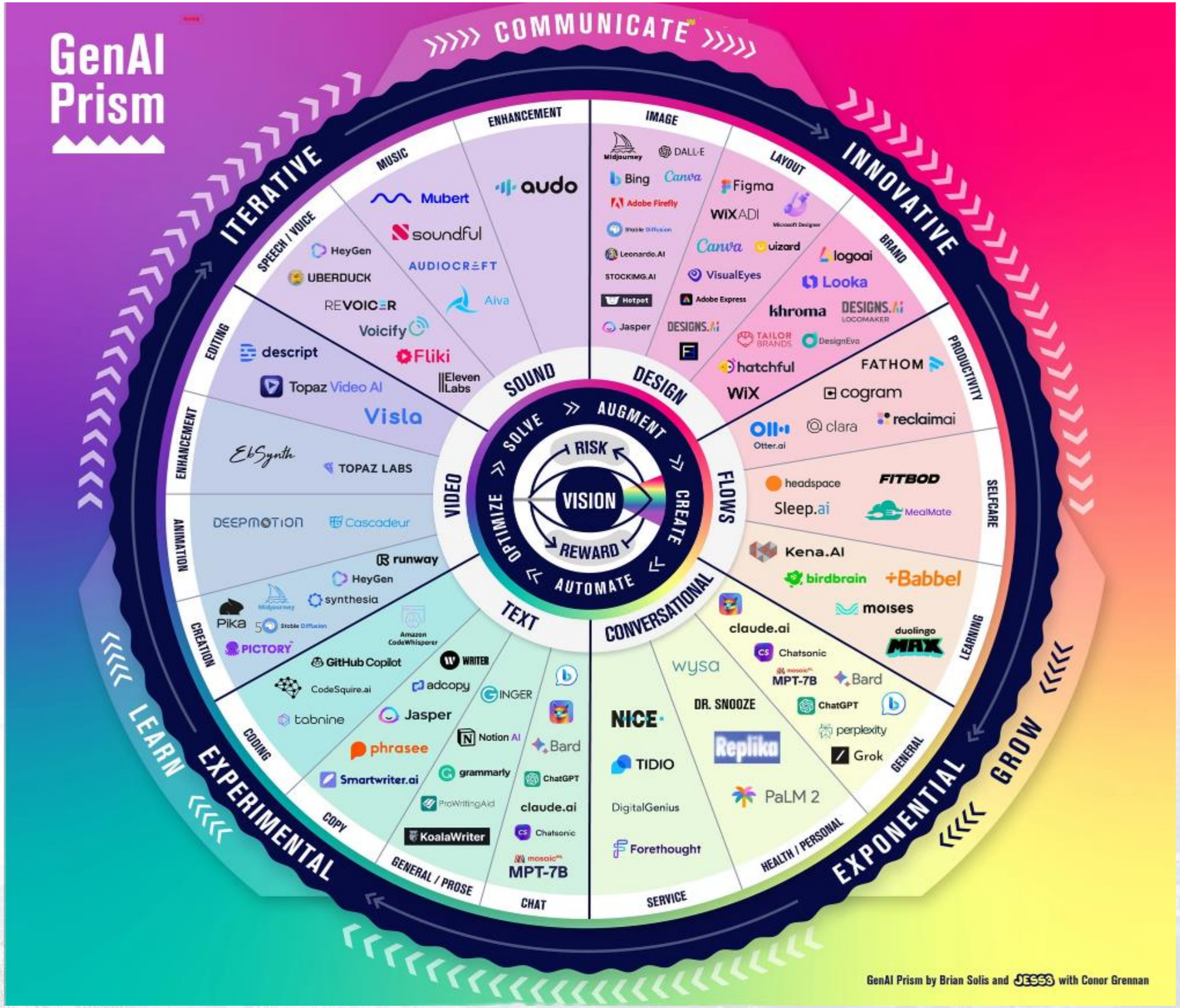
4.Output AI-generated Image

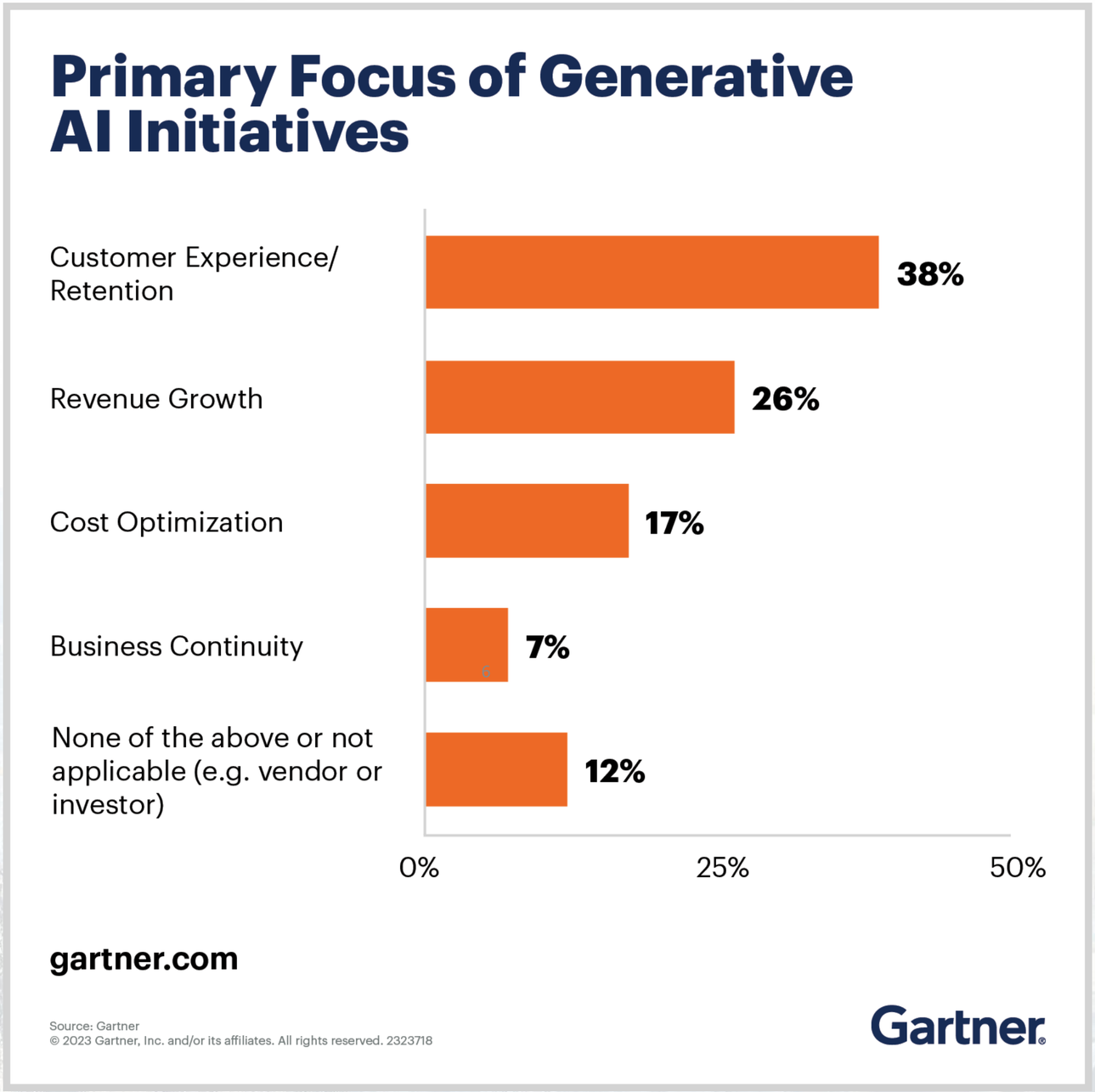
The final output is a generated image that aligns with the given input parameters.

(Source: PicLumen)

INTRODUCTION TO GENERATIVE AI (GenAI)

GenAI Tools




Primary Focus of Generative AI Initiatives
Customer Experience/ Retention
38%
Revenue Growth
26%
Cost Optimization
17%
Business Continuity
7%
None of the above or not applicable (e.g. vendor or investor)
12%
0%
25%
50%
gartner.com
Source: Gartner
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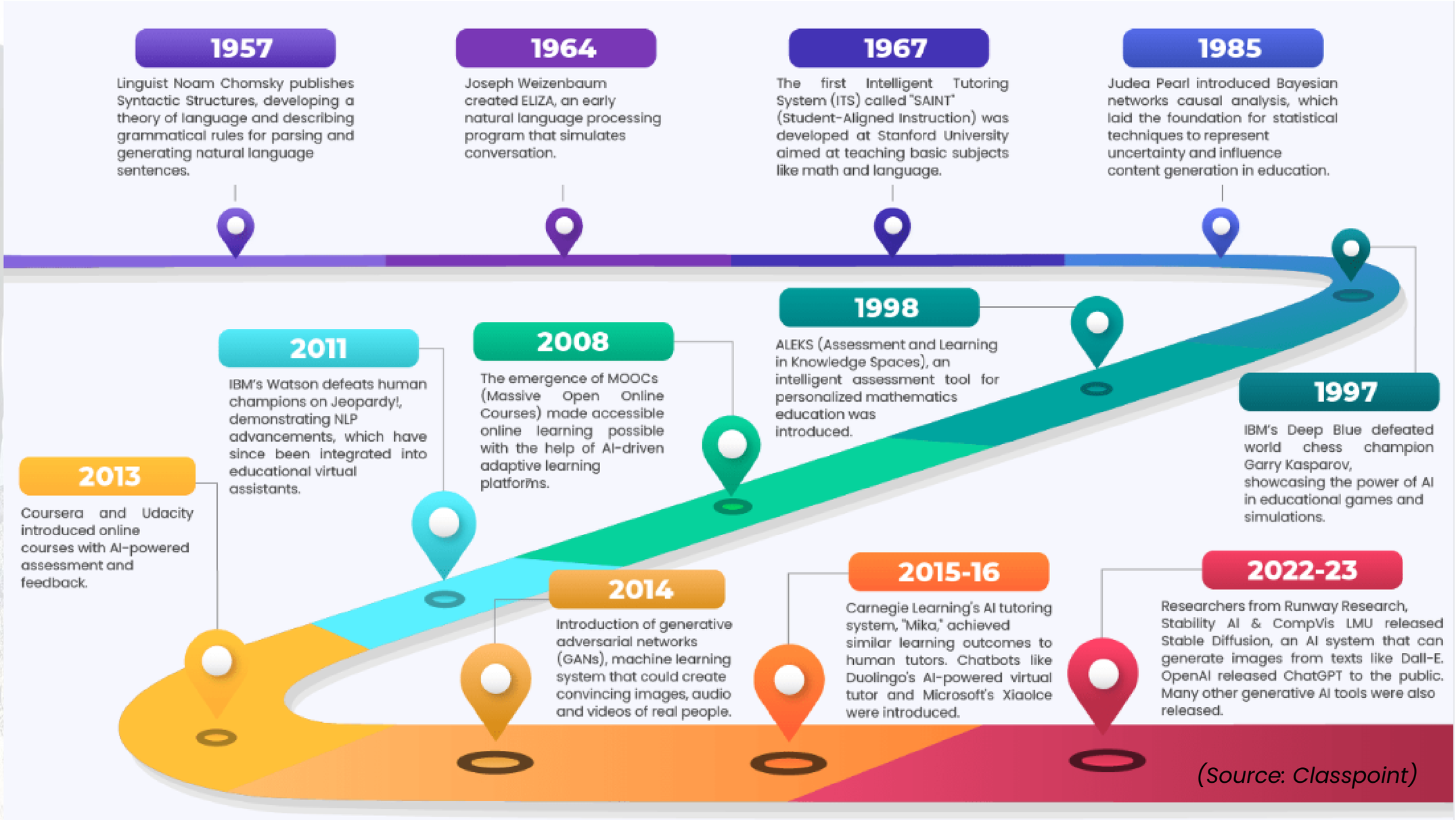
Evolution of AI in Education



(Source: Classpoint)

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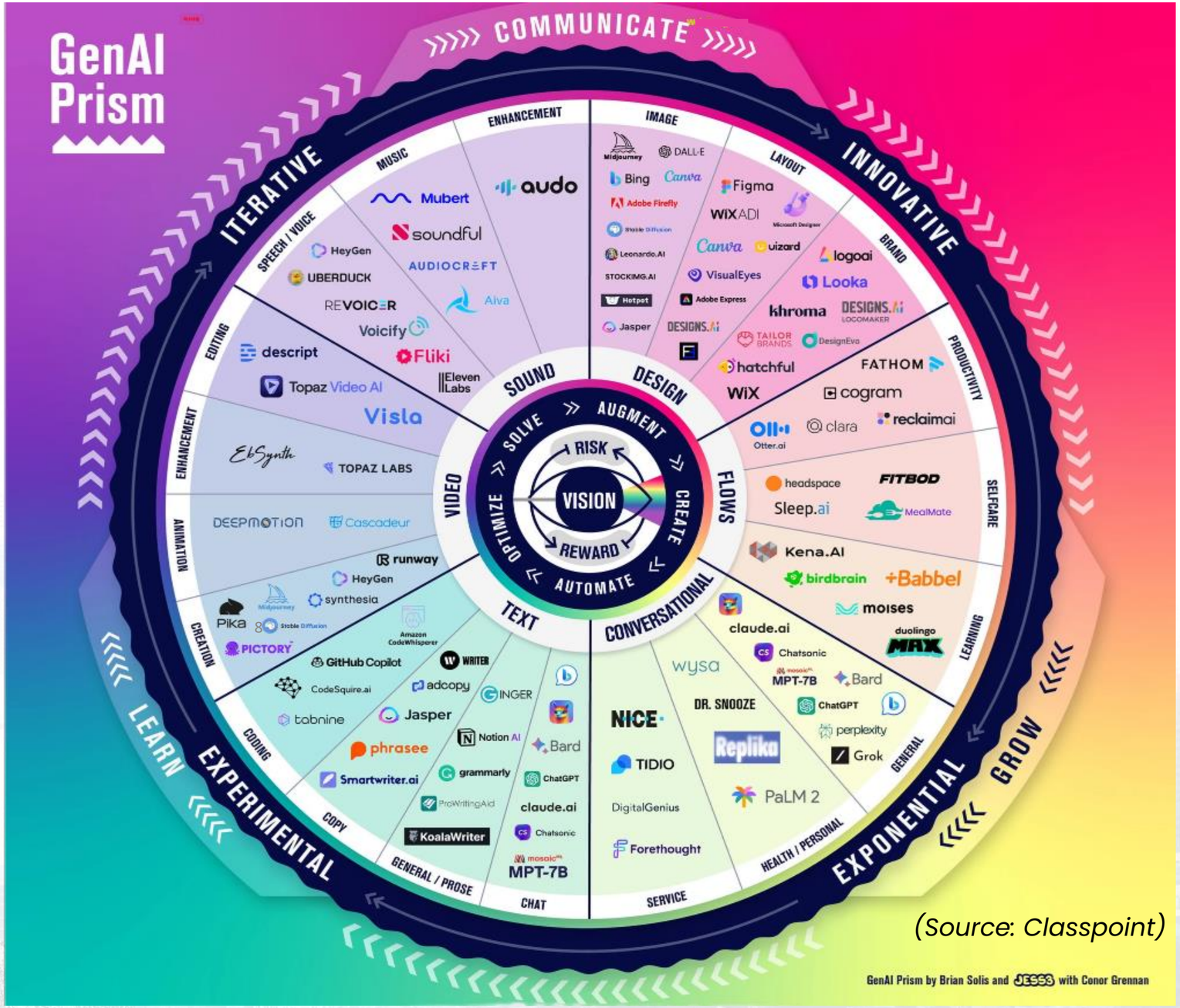
- Content Creation
- Personalisation
- Assessment
- Tutoring



(Source: Classpoint)

GenAI Prism by Brian Solis and JESS3 with Conor Grennan

Human or GenAI

TASKS	Human /GenAI / others
Tasks with moderately high creative difficulty, moderate context variability, and moderate accuracy	GenAI
Tasks with high accuracy and low context variability	Other forms of automation e.g. ML based applications or RPA
Tasks that have high context variability	Human

(Source: Deloitte)

Leveraging GenAI (Higher Education Institutions)

Operational excellence	**Streamline administration** Automate document processing in expense reporting and procurement administration	**Transform talent experience** Conduct initial screening of job applicants, onboarding assistants, inventory skills, and source training	**Accelerate financial insights** Verify financial policy compliance and generate financial reporting, and enhance forecasting and budgeting
Student success	**Personalize learning** Enhance admissions screening, create virtual tutors that deploy individual learning plans and infobots to give personalized career path guidance	**Support diversity, equity, and inclusion** Translate course materials, recruit diverse students with individualized recruiting, leverage sign language and AAC systems, create accessible campus maps	**Improve affordability** Automate FAFSA renewal notifications, match students with aid and scholarships, and personalize loan repayment processes
Research	**Identify opportunities** Identify research trends and synthesize emerging perspectives to discover research opportunities and enhance collaboration	**Accelerate grant responses** Reduce workload to perform literature reviews and generate responses to grants, increasing pursuit quality and quantity	**Support research administration** Enable rapid policy reviews and responses, support grant administrators with virtual assistants, and easily populate forms to reduce workload

(Source: Deloitte)

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Real World Application 1: AI-Powered Tutoring and Support Systems

- Adaptive Learning Platforms
- Virtual Tutors and Chatbots
- Feedback and Assessment
- Supplementary Learning Resources

Enhancing Learning with AI-Powered Tutoring and Support Systems

Article Date | 29 July, 2024

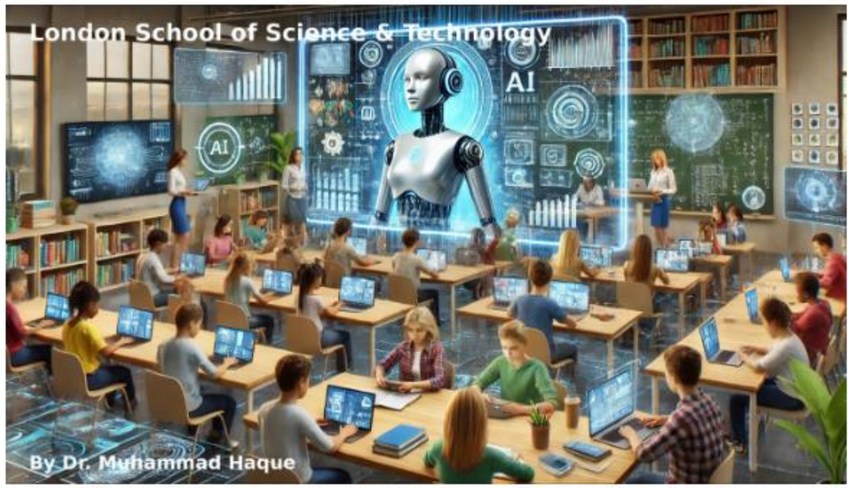

Image: Created by the author using DALL·E 2

By Dr Muhammad Emdadul Haque, Senior Lecturer at LSST Wembley

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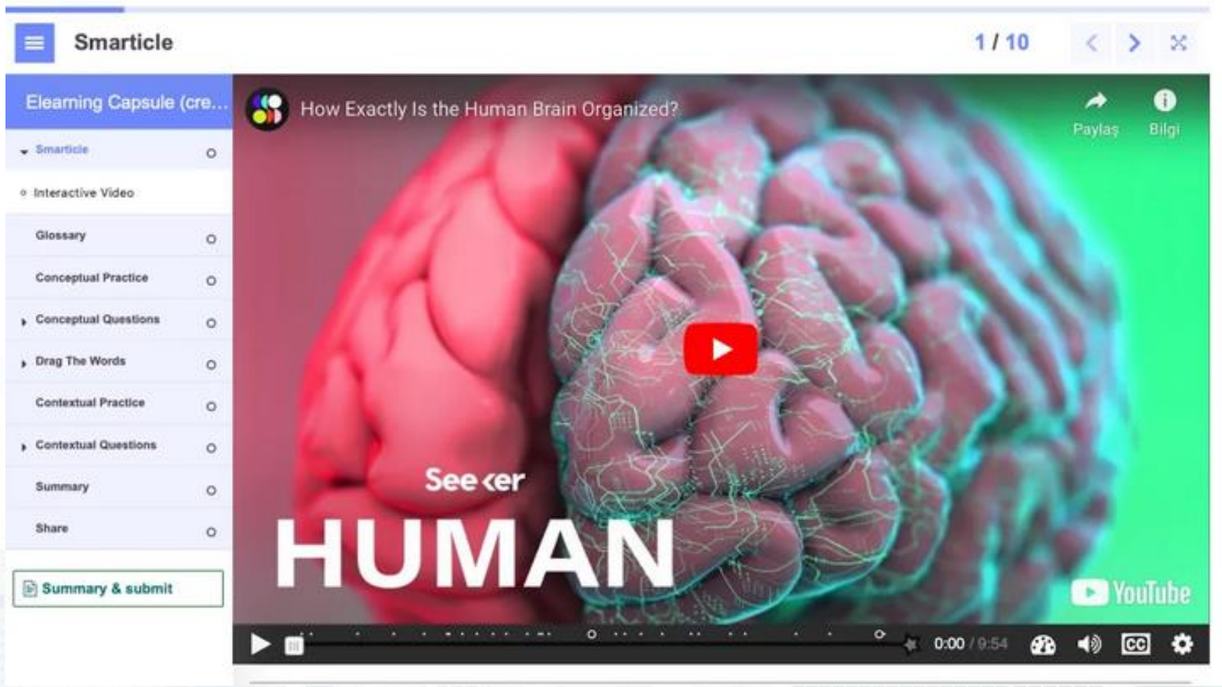
Real World Application 2: Content Creation for Courses

- Assist in creating new teaching materials

- Generate additional materials:
  - Reading lists
  - Study guides
  - Discussion questions
  - Flashcards
  - Summaries.



(Source: Nolej)

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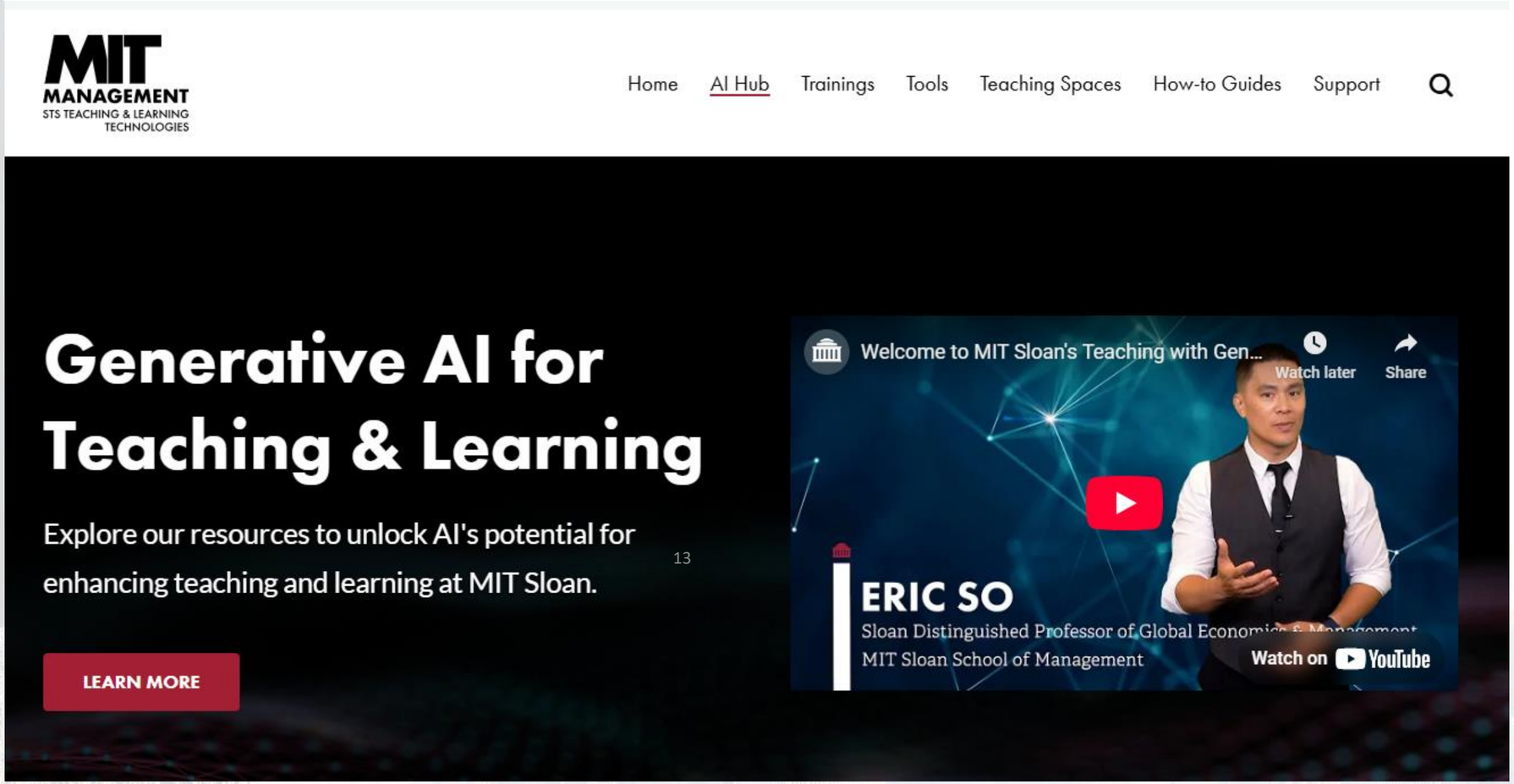
Real World Application 3: MIT Sloan AI for Teaching and Learning Hub



(Source: Nolej)

TRANSFORMING TEACHING AND LEARNING

Innovative Curriculum Design: Generate diverse learning pathways.

Real-Time Adaptation: Modify teaching on the fly to address student queries.

Interactive Learning: Enable simulations and gamified lessons.

Enhanced Creativity: Stimulate both teachers and students to explore new ideas.

Enhanced Student Engagement & Interaction

Dynamic Content: AI-generated visuals, simulations, and interactive quizzes.

Immediate Feedback: Automated grading and iterative learning cycles.

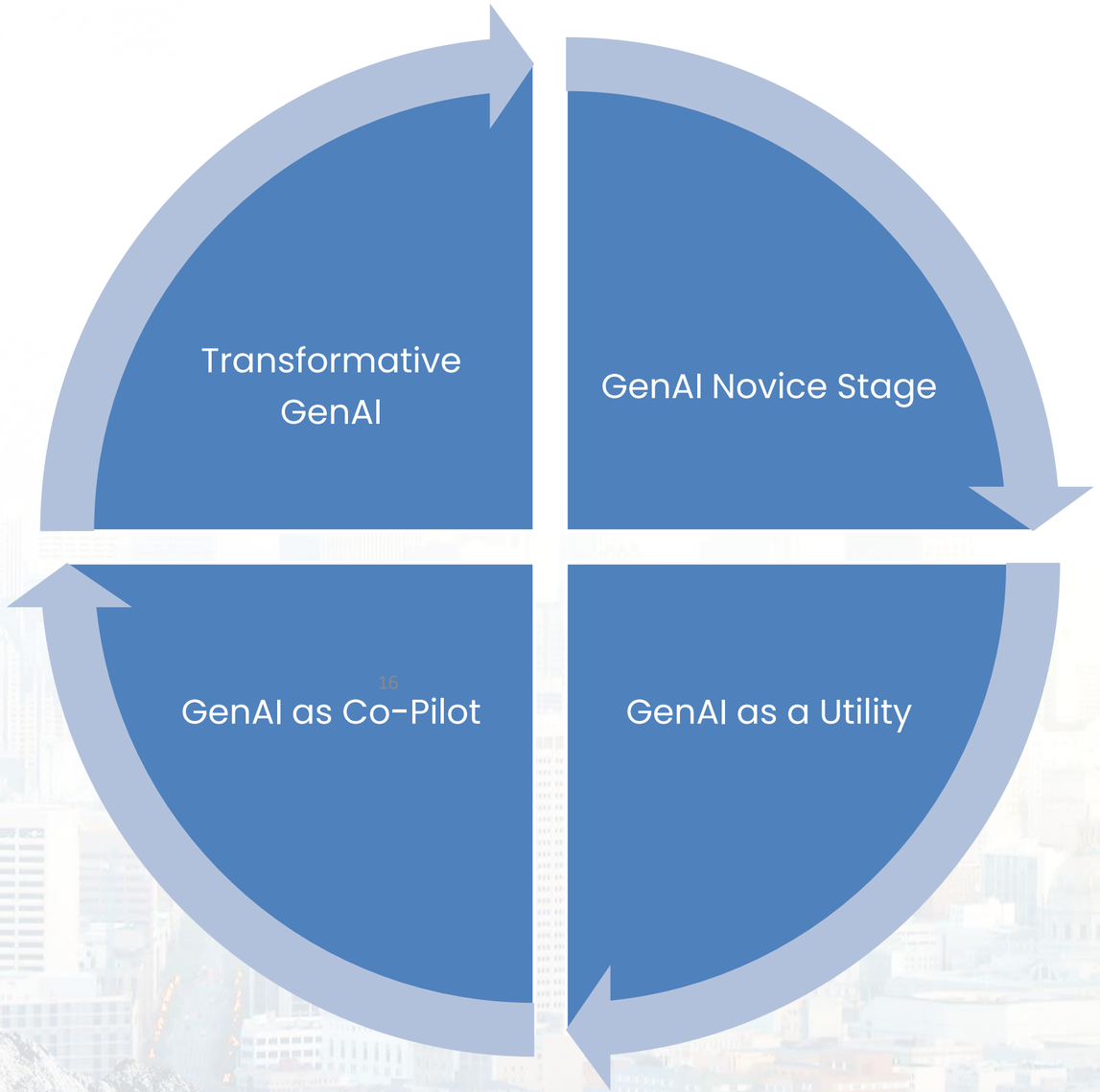
Collaboration Tools: AI-enhanced group projects and peer review systems.

TRANSFORMING TEACHING AND LEARNING

Responsible Integration of GenAI in Teaching and Learning

- Awareness of Disruptive Change
- Training Faculty
- Changing Teaching and Assessment Practices
- Students as Co-Partners with Faculty
- Imparting Learning Literacies adapted to the GenAI Era
- Applied Research is Needed

GenAI Integration Levels



OPPORTUNITIES AND CHALLENGES

Opportunities	Challenges
Personalised learning pathways	Bias and ethical issues in algorithm design
Scalable content creation	Data privacy and security concerns
Immediate feedback and assessment	Over-reliance on technology
Interactive learning and engagement	Digital divide and equal access

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EVOLVING ROLES OF EDUCATORS

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From content experts to facilitators:

Guiding student inquiry rather than delivering lectures.

Collaboration with AI

leveraging ai-generated insights to enhance curriculum.

Continuous professional development

Updating skills to integrate emerging technologies.

Innovation & Creativity

Encouraging experimental teaching methods.

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THANK YOU

FOR YOUR ATTENTION