Notest — Revolutionising Online Learning

Introduction

Lifelong learning is an important but hard skill to master. Can't recall what you watched? Feel like you are not retaining learning? Wasting time re-reading notes? The internet is a sea of noise that drowns you out!

Online learning suffers from a lack of community, coherency and accountability. Current learning experiences are solo, and as a result, learners are lost without knowing where to start from. This causes them to get stuck and confused easily, lacking the discipline to finish online courses.

Notest is a community-driven platform that helps students learn effectively by creating a personalised learning experience based on individual needs. We use artificial intelligence to provide contextualised questions to enhance the learning experience.

Imagine a worksheet that you would fill out after reading an essay, but one that is smart and adapts to your learning style and pace.

Our current MVP allows learners create learning material and generate questions using AI from any source text (e.g. a paragraph from an article, a poem, etc.) Learners are able to efficiently learn the content by answering the generated questions instead of re-reading all the information or aimlessly surfing the web. They can then share their Notests with others on a common marketplace!

Community
Learners online are isolated and are forced to learn by themselves

Coherency
Learners don't know what to learn and start their journey. They get easily stuck and lost

Accountability
Learners that are confused get frustrated and stop learning online
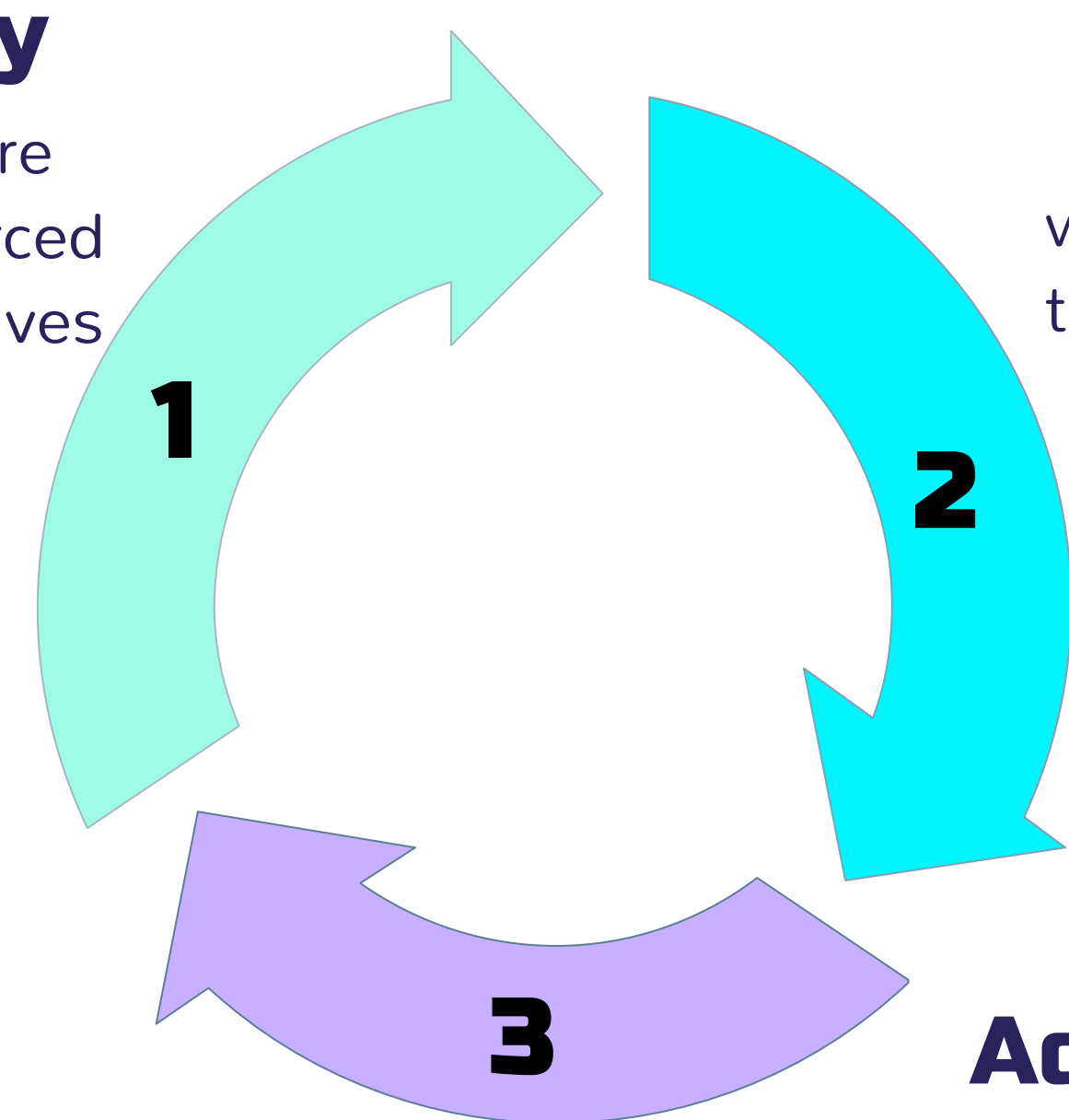
Fig A. Diagram illustrating the current cycle of poor online learning experiences that are common on platforms like Coursera, YouTube and Khan Academy

Objectives

We use AI to generate questions and answers from user-specified texts, eliminating the need to come up with questions themselves.
Learners can then test themselves using spaced repetition while also referencing past mistakes to review in the future. Notests are timed so that users can mimic a real testing environment. Learners can also share their Notests in the Marketplace, from which they can also explore others' Notests to supplement their learning. We help students take the initiative in learning and prosper in an active community of learners.

Motivate
Identify a topic of interest as a learner

Identify
Find the Notests in the marketplace or create new Notests

Learn
Learn with spaced repetition and community support

Share
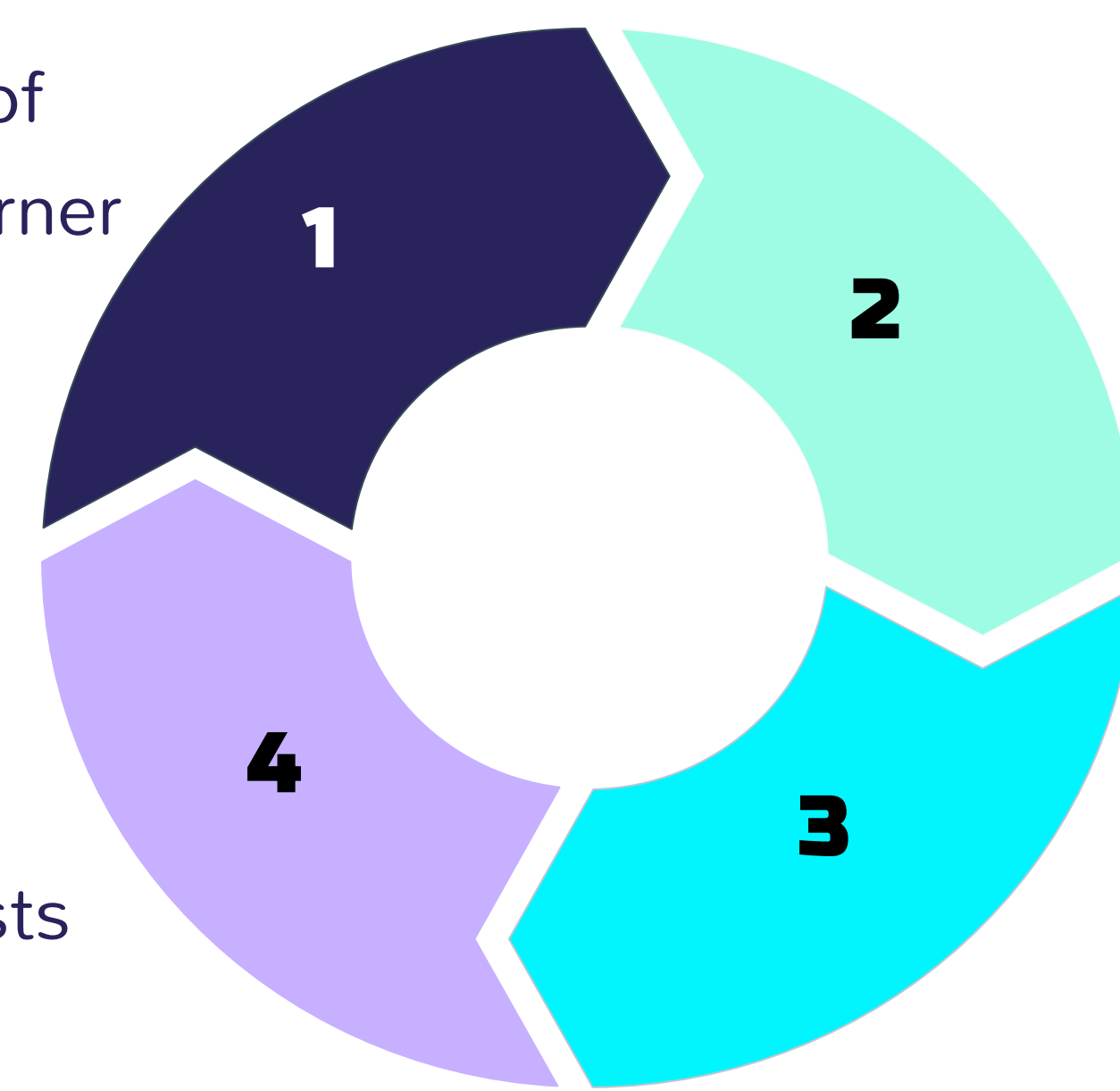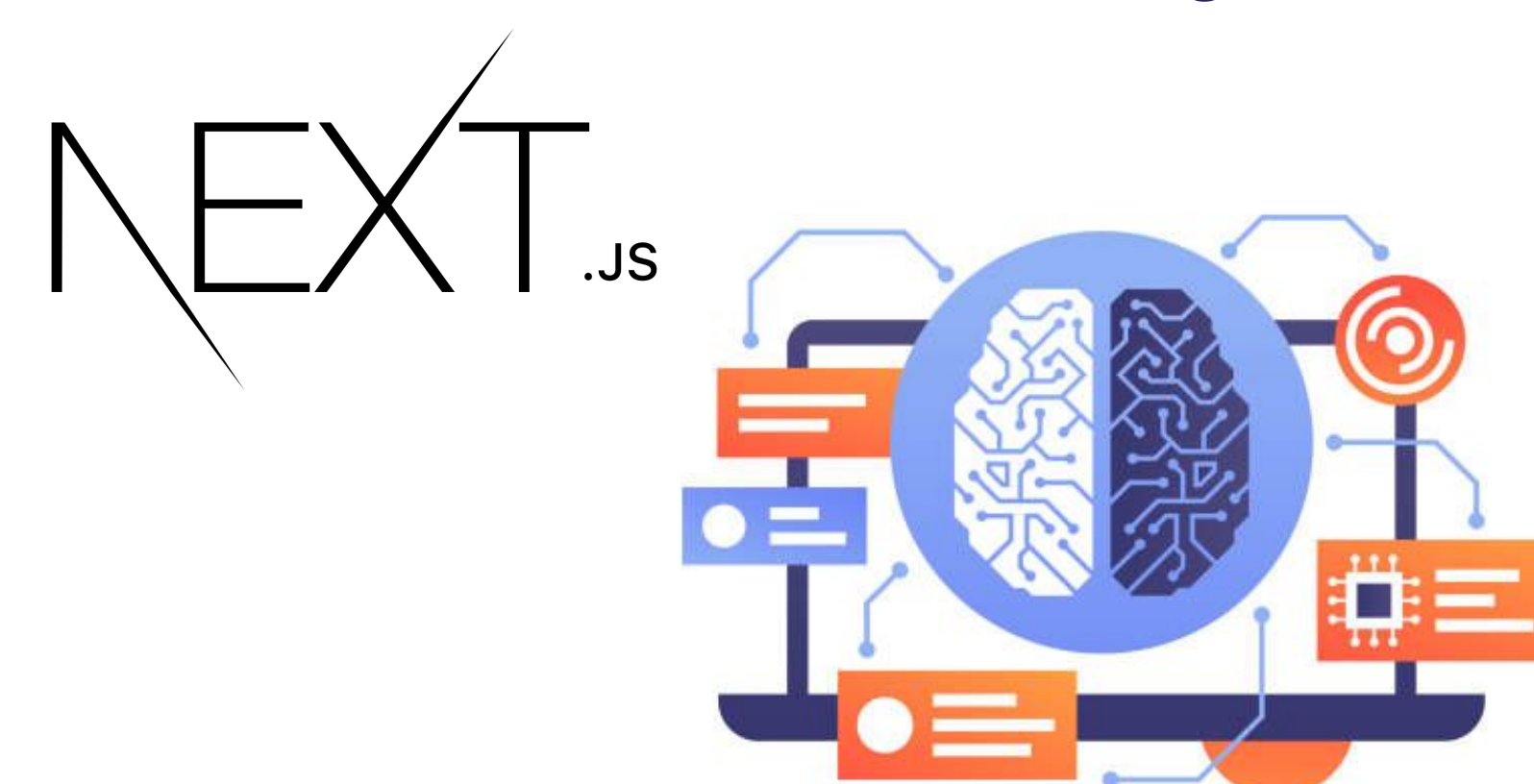Share the Notests with others for rewards and feedback

Fig B. Diagram showing the flow of how a learner would interact with our platform and improve their learning experience through a 4 stage process

Materials and Methods

Modern psychology research supports our practice. A review conducted by John Dunlosky et.al on the effectiveness of learning techniques found that practice testing (which included self-testing) and spaced repetition was found to be the best way of learning.

We use Generative Pre-trained Transformer 3 (GPT-3) for our AI natural language model through Open AI. Currently, we have developed our application using Next.js on React, with our backend database stored in MongoDB

Results

53 interested students and beta testers on discord accumulated in a week through word of mouth (no advertising costs).

40% of participants in our user studies are pre-med students who need to study for the MCAT. All of them expressed interest in Notest, among whom 3 have already started to extensively use it.

The humanities students studying art history or sociology who are using our beta release reported at least a **20%** boost in efficiency in knowledge retention.

80% of those interviewed mentioned that they would recommend our application to their friends.

Conclusion

Our long-term goal focuses on incorporating AI and deep learning methods to provide more valuable questions as well as summarize large amounts of text. We also hope to enable users to be able to share their notes and questions with each other through our application. In 1-year, we hope to have a sizeable ecosystem of users that is not limited to JHU. In 5-years our goal is to be an e-learning platform widely adopted by different schools across the world.

With Notest, we imagine a future where lifelong learners are able to transform how they learn and commit knowledge to long-term memory, through AI question generation and self-testing using spaced repetition, and ultimately thrive in a community sharing knowledge. You will test yourself with your notes till there's no tests left. Notice Notest.

When forty winters shall besiege thy brow,
And dig deep trenches in thy beauty's field,
Thy youth's proud livery, so gazed on now,
Will be a tatter'd weed, of small worth held:
Then being ask'd where all thy beauty lies,
Where all the treasure of thy lusty days,
To say, within thine own deep-sunken eyes,
Were an all-eating shame and thriftless praise.
How much more praise deserved thy beauty's use,
If thou couldst answer 'This fair child of mine
Shall sum my count and make my old excuse,'
Proving his beauty by succession thine!
This were to be new made when thou art old,
And see thy blood warm when thou feel'st it cold.

Source Text (poem)

Fig C. Example of the AI model interpreting questions from a an English Poem. As we can see there are a number of questions that encourages the learner to engage with the poem on a deeper level

Generated Questions

Q 1. What is the speaker referring to when he speaks about "thy youth's proud livery"?
A The speaker is referring to the youth's proud livery as being something that is gazed on now, but that will be a tatter'd weed, of small worth ...

Q 2. How will the speaker's beauty be seen in the future?
A The speaker's beauty will be seen in the future as a "tatter'd weed, of small worth held".

Q 3. Why is it a shame to say that all of the speaker's beauty lies within his own eyes?
A It is a shame to say that all of the speaker's beauty lies within his own eyes because it implies that he is not confident in his own appearance...

Q 4. How could the speaker prove his beauty through his son?
A The speaker could prove his beauty through his son by providing examples of how his son has inherited his good looks.
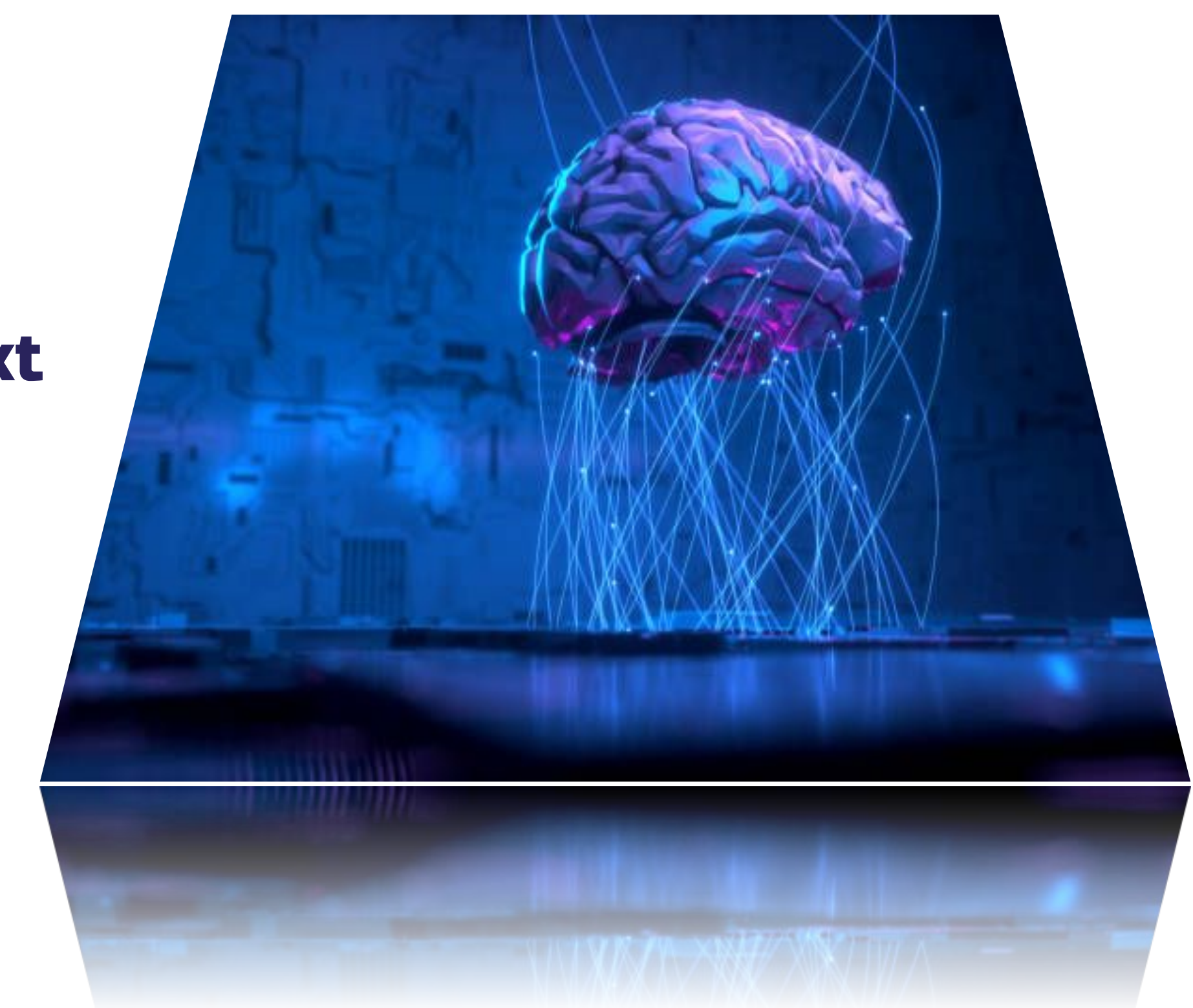
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