Are you ready for AI?

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Does AI have a massive future? Sure! Please insert another coin.

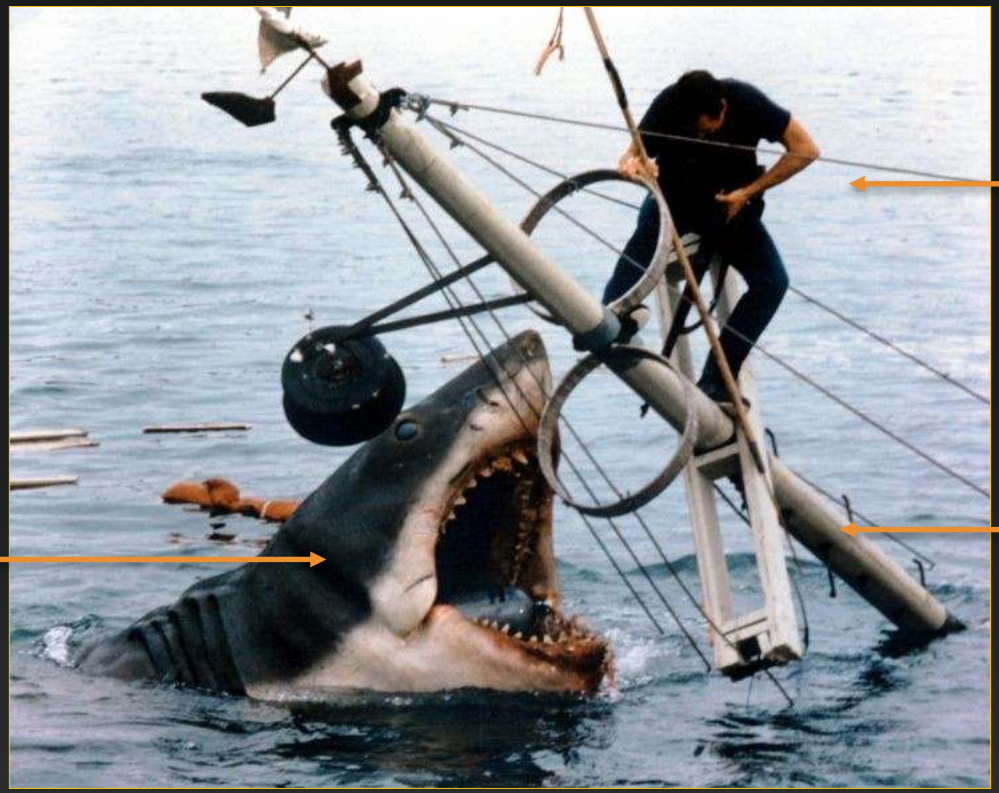
Do we (the builders) have a clear idea how to get there? Hmmmm.

« If you want to know the future, look at the past »

Albert Einstein

What's our collective track record on understanding and implementing disruptive technologies?

2000



You

Your Web project

Your users

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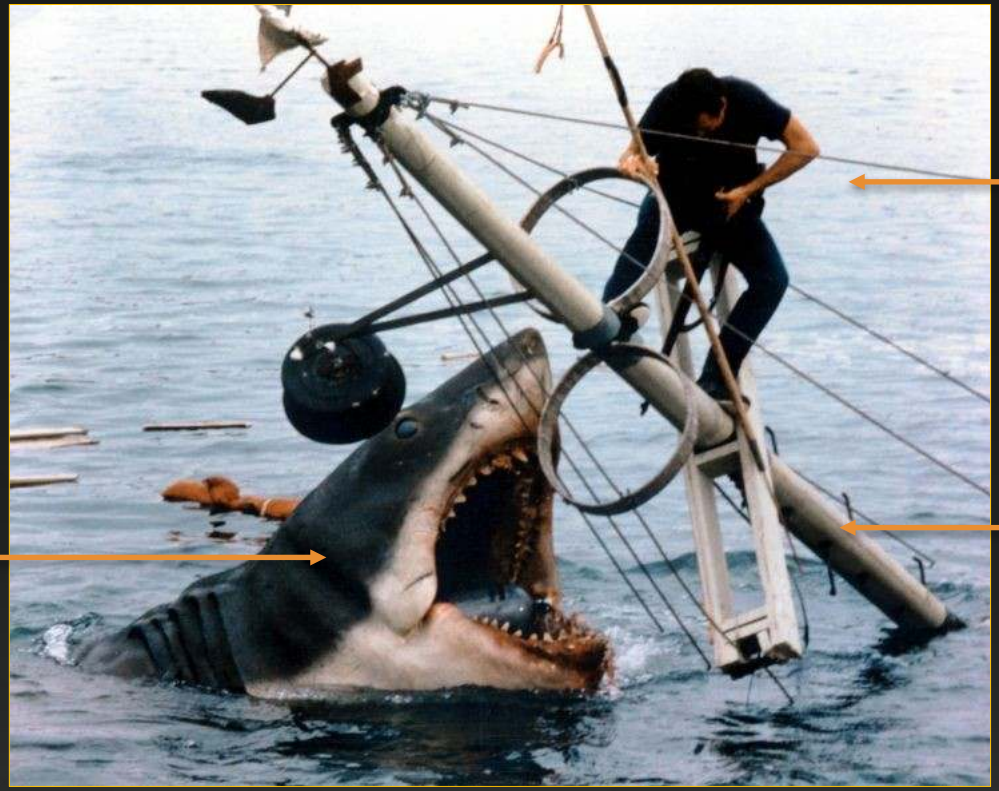
2005



You

Your user s

Your E-commerce project

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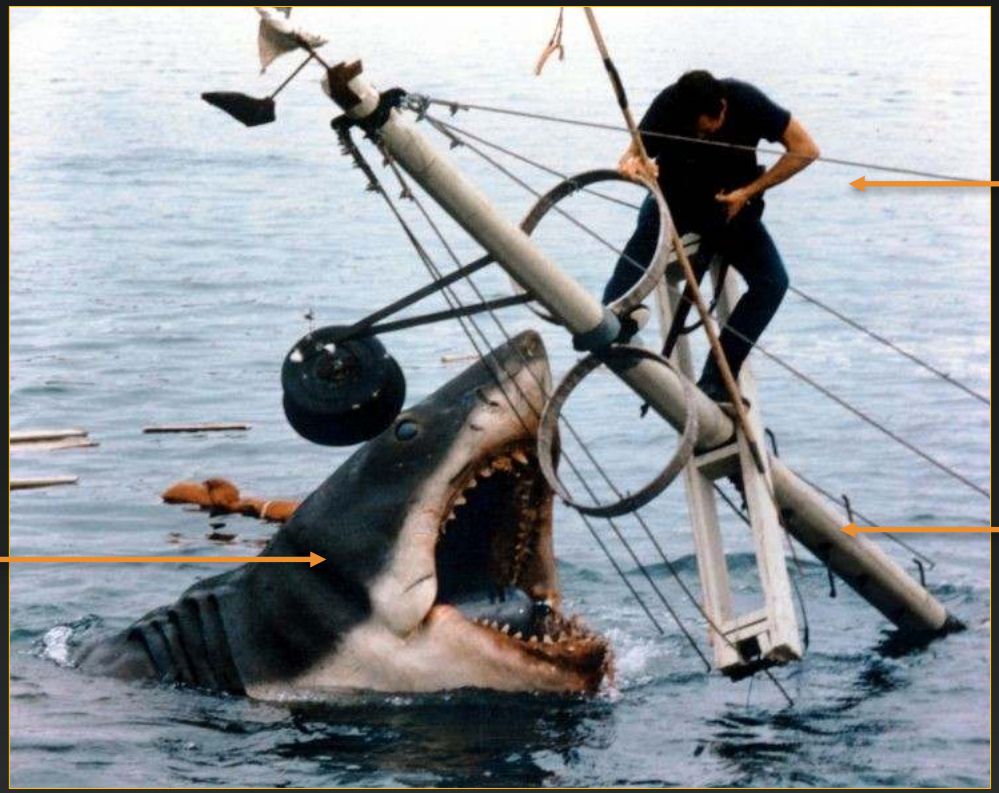
2010



You

Your users

Your Mobile project

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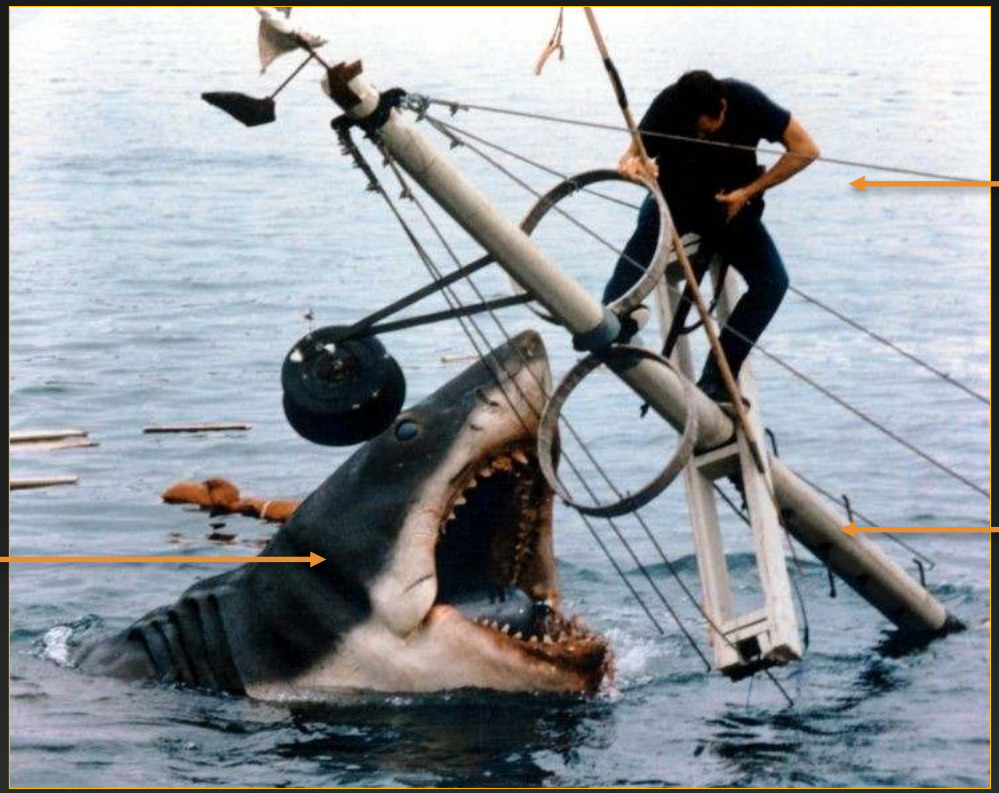
2015



You

Your user s

Your Big Data project

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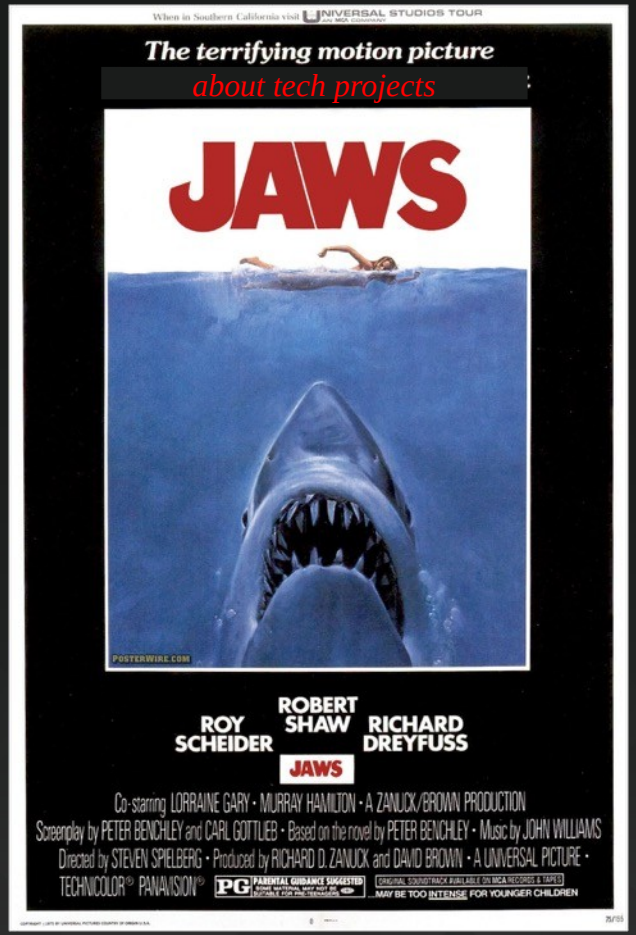

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The terrifying truth about tech projects

Delusional stakeholders
Business pressure
Unprepared team
Inadequate tools
Improvised tactics
Random acts of bravery

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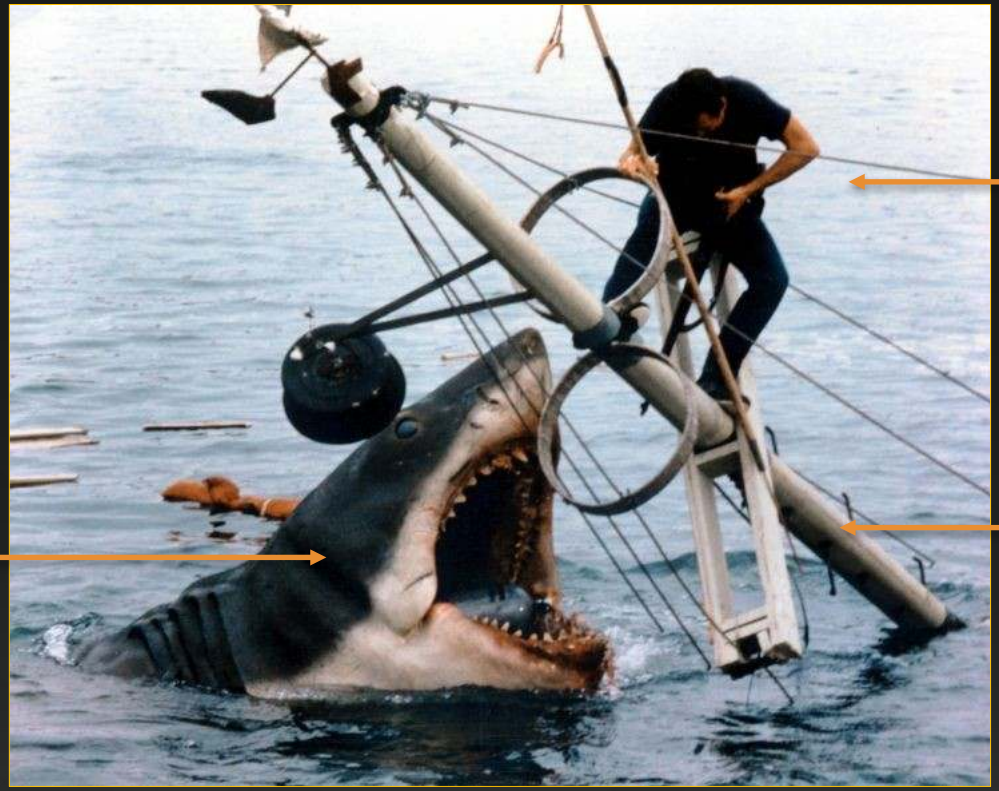
« It’s different this time!
The AI revolution is here!
Blah blah blah »

You know who

2020



You

Your users

Your AI / ML project

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« Insanity is doing the same thing over and over again and expecting different results »

Whoever said it first

Tired of being shark food?

Delusional stakeholders
Business pressure
Unprepared team
Inadequate tools
Improvised tactics
Random acts of bravery

Set expectations
Define clear metrics
Assess your skills
Pick the best tool for the job
Use best practices
Iterate, iterate , iterate

1 - Set expectations

- What is the business question you're trying to answer?
  - One sentence on the whiteboard
  - Must be quantifiable
- What data would a human look at to answer it?
  - Is that data available?
  - How much do you have?
  - How hard is it to collect more?
- Involve everyone and come to a common understanding
  - Execs, Business, IT, Data Engineering, Data Science, etc.

« We want to see what this technology can do for us »
« We have tons of relational data, surely we can do something with it »
« I read this cool article about FooBar ML, we ought to try it »

2 - Define clear metrics

- What is the business metric showing success?
- What's the baseline (human and IT)?
- What would be a significant and reasonable improvement?
- What would be reasonable further improvements?

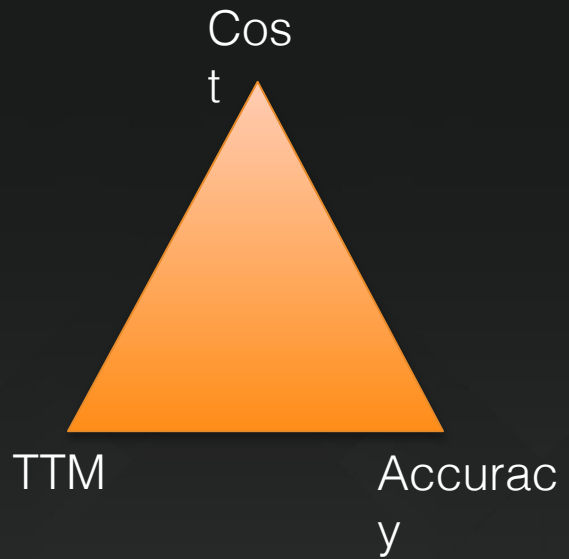
« The confusion matrix for our IT ticket classifier looks much better ». Huh?
« P90 time-to-resolution is now under 24 hours ». Err….
« Misclassified emails have gone down 5.3% using the latest model ». So?
« The latest survey shows that 'very happy' customers are up 9.2% ». Woohoo!

3 - Assess your skills

- Can you build a data set describing the problem?
- Do you know how to clean and curate it?
- Can you write and tweak ML algorithms?
- Can you manage ML infrastructure?
- … Or do you only want to call an API and get the job done?

4 - Pick the best tool for the job

- Cost, time to market, accuracy: pick two
- The least expensive and fastest option won't probably be the most accurate.
  - Maybe enough to get started, and learn more about the problem.
- Improving accuracy will take increasingly more time and money.
  - Diminishing returns! Know when to stop.
- Keep an eye on actionable state of the art advances, ignore the rest
  - Transfer learning
  - AutoML



5 - Use best practices

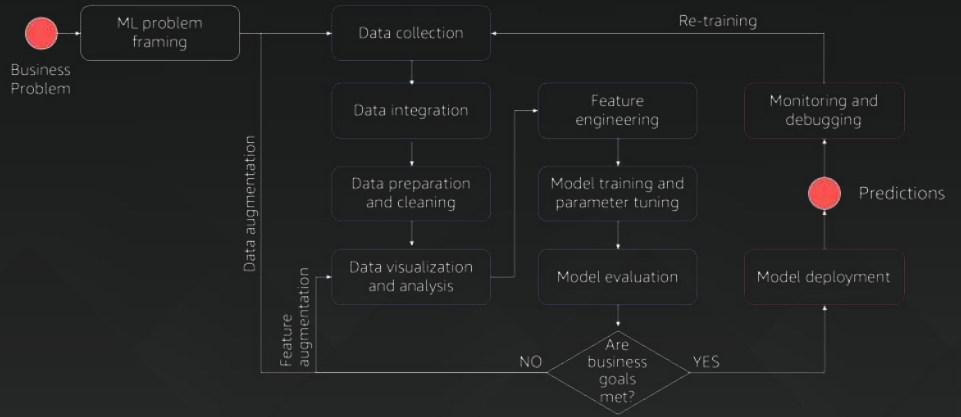
- No, things are not different this time.
- AI / ML is software engineering
  - Dev, test, QA, documentation, Agile, versioning, etc.
  - Involve all teams
- Sandbox tests are nice,
  but truth is in production
  - Get there fast, as often as needed
  - CI / CD and automation are required
  - Devops for ML

Universal Pictures

6 - Iterate, iterate, iterate

aka Boyd's Law (1960)

- Start small
- Try the simple things first
- Go to production quickly
- Observe prediction errors
- Act: fix data set?
  Add more data?
  Tweak the algo?
  Try another algo?
- Repeat until accuracy gains become irrelevant
- Move to the next project



AWS Government, Education, & Nonprofits Blog

Using Data in Education: Four Steps to Success

by AWS Public Sector Blog Team | on 21 FEB 2019 | in Education, Public Sector | Permalink | Share

Global education ministers gathered at the Amazon Web Service Institute's roundtable at Education World Forum to discuss using data to address major challenges in education.

https://aws.amazon.com/blogs/publicsector/using-data-in-education-four-steps-to-success/

« Does this work? »

Everyone in this room

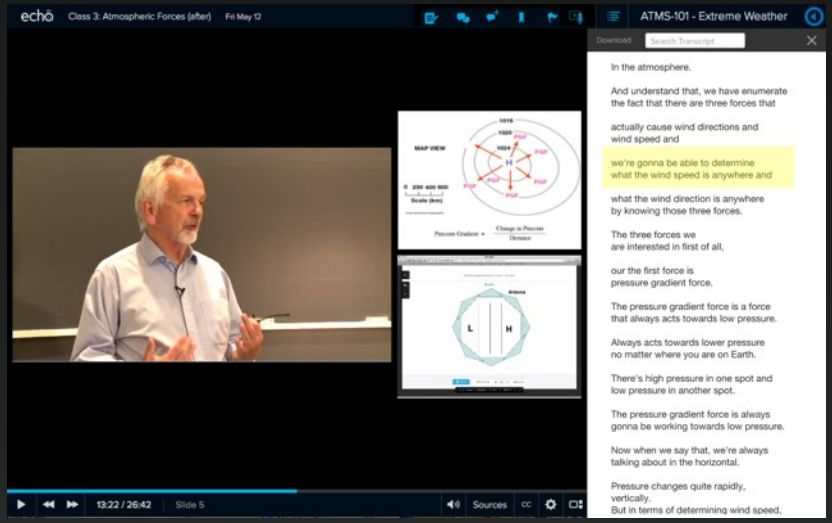
AI and Machine Learning on AWS

Tens of thousands of customers

Automatic transcription of classes

https://aws.amazon.com/solutions/case-studies/echo360/

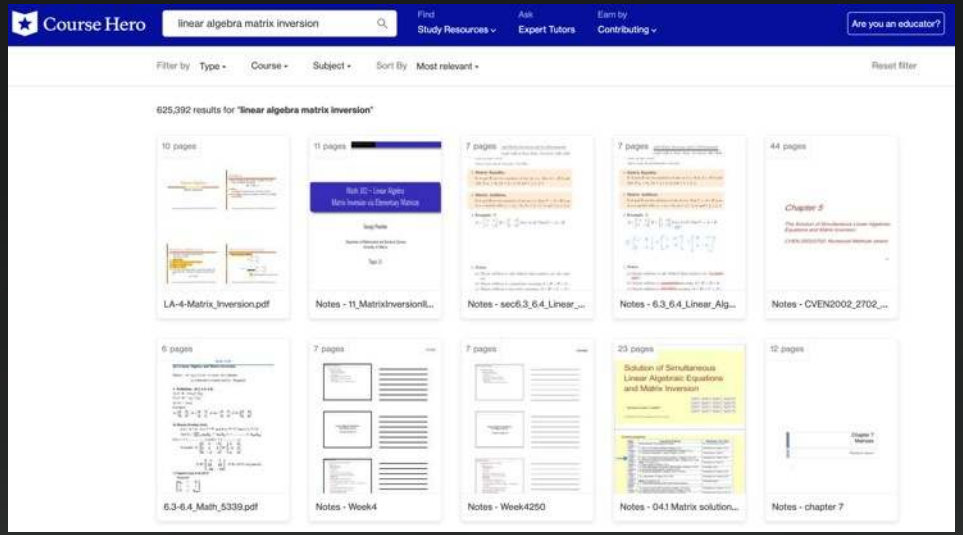
- Amazon Transcribe
  - Call an API, job done
  - 31 languages, 6 in real-time
- Students can focus on listening to and engaging with the lecture instead of trying to write down every word
- Students can later review accurate transcriptions, synchronized with slides and video thanks to timestamps
- Could easily be combined with Amazon Translate



Personalizing studying

https://aws.amazon.com/blogs/publicsector/personalizing-studying-with-machine-learning-course-heros-approach/

- Helps student gain mastery or dive deep on over particular concepts
- 25 million course-specific materials
- Materials are checked and classified by machine learning jobs running on Amazon EMR and Amazon SageMaker



Predicting student success

https://aws.amazon.com/solutions/case-studies/ivy-tech-community-college-of-indiana/

- Identify behaviors of successful and unsuccessful students
- Predict with 80% accuracy, which students are likely to fail a course within the first two weeks of a 16-week term
- Struggling faculty can be identified and addressed before they impact students
- Flagging fraudulent activity far earlier using Natural Language Understanding tools to analyze course evaluations

« We have an analysis kit we run every day, looking at data, comparing patterns over previous years' information, and in a matter of seconds, we can tell if a student is likely to succeed or fail. The results have been phenomenal. »

Lige Hensley, CTO, Ivy Tech

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https://ml.aws

https://aws.amazon.com/education/

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