

Data Factory

IBS Data & AI
vision and
practice





“data is the new oil”

Clive Humby, British mathematician
2006

What Clive meant is that:

“data, like oil, isn't useful in its raw state.

It needs to be refined,
processed and turned into
something useful”

Нашата Цел



Предизвикателства

Бюджет и Инвестиции
Къде и за Какво харчим

Управление
Как направляваме лодката

Къде отиват \$\$\$

Управленски решения
ускоряване и информираност

\$\$\$\$

Регулации
съответствие

\$\$\$\$\$\$\$\$

Иновации
Търсене на предимство

\$\$\$

Къде отиват \$\$\$

Операции
инфраструктура, поддръжка,
промени и актуализация



Консервативно Управление

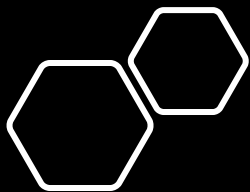
Каквото знаем
Както си го знаем

„Искахме да е по-добре,
но се получи както винаги“

Умножаваме Data приложенията и
правим все по-сложни архитектури

Бюджетът нараства

Времето за реализация нараства



На ръба на Хаоса

Границата на хаоса е нормалното състояние на нещата и не може да бъде смекчена само от технологиите.

Самата природа на системите е, че те възникват и се развиват без пълно разбиране на всички зависимости и поведения.

Какво е *Решението?*

Решението е ИТ
практиките да се
изпълняват с високо
ниво на **дисциплина**
процес на **непрекъснато**
подобрене

За да не се получава КАКТО ВИНАГИ



Гъвкава и ориентирана към данните организация

Опростена и Надеждна архитектура

LEAN/ТОС процес за непрекъснато подобрене

Фокусирани и Овластени екипи

Доволни потребители

Области по компетенции

Интеграция на данни

Моделиране на структури от данни

Визуализация

Предвиждане, вкл. ML/AI

Планиране и what-if анализи

Advanced AI – NLP, Vision, LLM, GenAI

Governance

Сигурност

Маскиране

Data Lineage

RegRep & Compliance



**Daniela
Dimitrova**

Data&AI Leader
IBS



2023 - 2024

AnaCredit



2023 г.

ECB Loan Tape

2023 г.

Credit Factors

2023

ReLif

2023

DQ rules Relif

2021 - 2022

ECB Loan Tape

2022 - 2023

*Consolidated
Reports*

Предизвикателства

Проектите ни отправят предизвикателства, а преодоляването им осмисля нашата работа!

Индустриално знание

Познаване на регулаторната рамка, умение да четем регулации и да тълкуваме заложените изисквания

Бизнес речник

Да говорим на един език и да разбираме бизнес понятията

Екипност

Изграждане на ефективна работна комуникация между екипите

Планиране и проектиране за промяна

Динамично променящи се изисквания от страна на Регулатора и/или други зависимости

Качество на данните

Готовност за намиране на гъвкави решения

Собственост на данните

Идентификация на реалните бизнес собственици на данните.

Data Governance

Rules, Processes and
Accountability



Tzvetilina
Peycheva

Data&AI Customer
Success, IBS

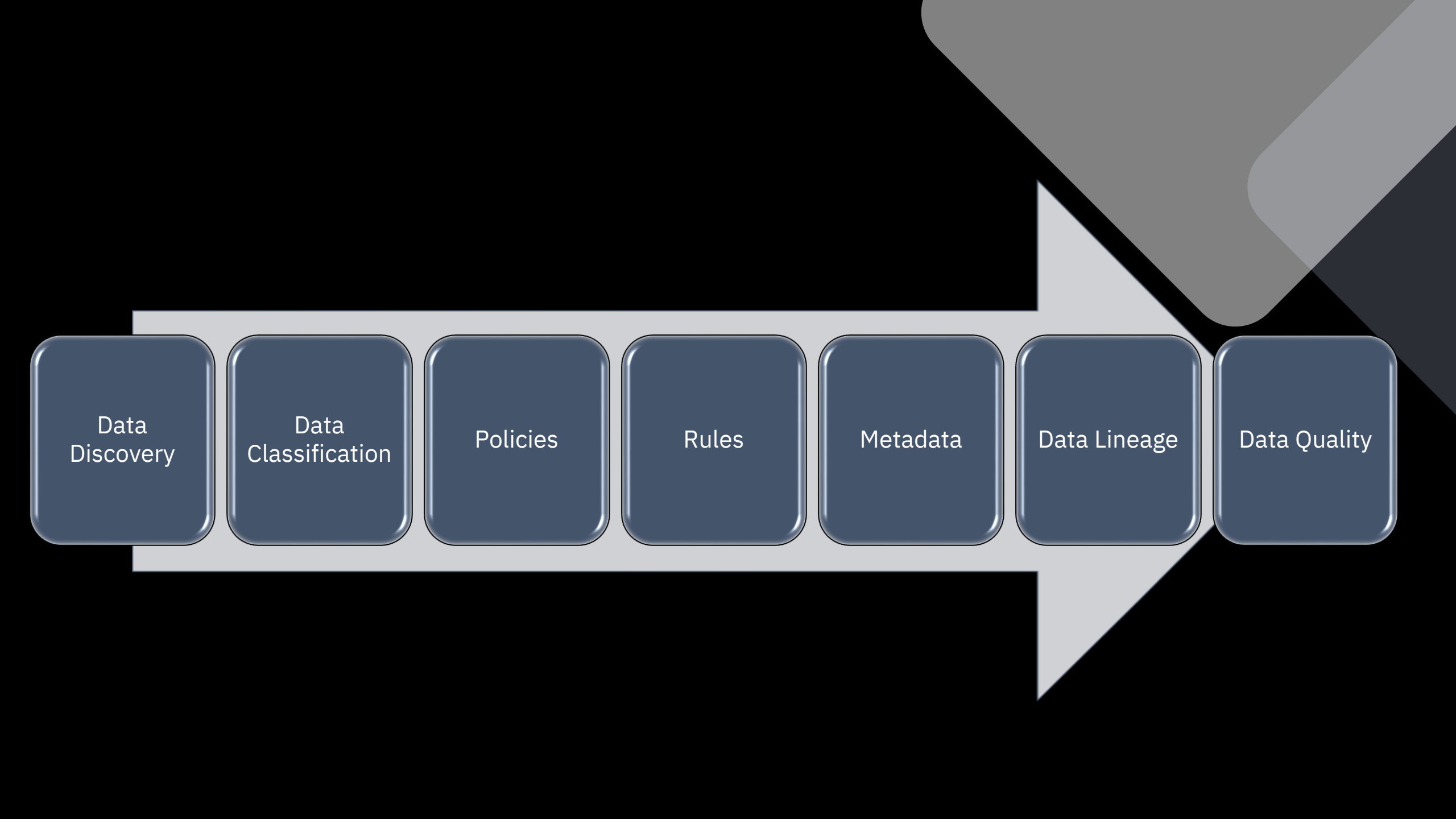


Имаме ли?

- ✓Общ **бизнес речник**
- ✓**Правила и политики** за управление на данните
- ✓**Проследимост** на пътя на данните от първоизточника до крайния отчет
- ✓**Политики за сигурност** на данните и същевременно разширен достъп до данни на повече бизнес потребители
- ✓Общи правила за **проверка качеството** на данните

Data experts:

“Data Preparation accounts
for about **80%** of all the
work”



Data
Discovery

Data
Classification

Policies

Rules

Metadata

Data Lineage

Data Quality



Data Quality

Data
Discovery

Data
Classification

Policies

Rules

Metadata

Data Lineage



Ai

**WHO will Rule
the World**



Stephen Hawking:

“AI is likely to be either
the best or **the worst**
thing to happen to
humanity”

Artificial Intelligence has evolved significantly in the past year

Artificial Intelligence

=

the ability to mimic human intelligence
eg. understand, reason and learn

Traditional AI

Programs that can analyze content to make predictions and prescribe actions

eg. forecast revenue based on historical sales

eg. prescribe next best offer

eg. visually identify product defect

Analytics

Machine Learning

Deep Learning

Generative AI

Programs that can generate net new content and better understand existing content

eg. create image from prompt

eg. answers questions from PDFs

eg. summarize an article

Foundation Models

Large Language Models

IBM watsonx.ai

Auto AI Game changer

Welcome, Rob

Train, validate, tune,
and deploy AI models.

[Customize your journey](#)

Open in: Rob's Sandbox

[...]

Experiment with
foundation models and
build prompts

with Prompt Lab

🧠

Build machine learning
models automatically

with AutoAI

{ }

Build machine learning
models using code in R
or Python

with Jupyter Notebook editor

🔗

Prepare and visualize data

with Data Refinery

From the homepage, Rob selects Build machine learning models automatically with AutoAI to start building her predictive machine learning model.

Collapse

Recent work

Projects

+

Rob's sandbox

Just now

RA

Deployment spaces

+



After you create or join spaces, they will appear here.

Discover

Samples

- 📌 Foundation models
- 📌 Prompts
- 📌 Data
- 📌 Projects
- 📌 Notebooks

Featured



gpt-neox-20b

GPT-NeoX-20B is a 20 billion parameter autoregressive language model trained on the Pile using the GPT-NeoX library. Its architecture resembles that of GPT-3, and is almost identical to that of GPT-J-6B.

Build machine learning models automatically

Define the details to create an AutoAI experiment asset and open it in the AutoAI tool.

+ New

☰ Samples

Define details

Name

Credit Risk Experiment

Description (optional)

What's the purpose of this AutoAI experiment?

Tags (Optional)

Search tags

Add tags to make assets easier to find.

Define configuration

Watson Machine Learning Instance ⓘ

WatsonMachineLearning

Environment definition

8 CPU and 32 GB RAM

This environment definition consumes **20 capacity units per hour for training**. For details see [Watson Machine Learning plans](#).

Rob first defines the configuration and environment to create an AutoAI experiment.

Click Create.

Cancel

Back

Create



Configure AutoAI experiment

Credit Risk Experiment

Last saved: 00:00:00 PM

Add data source



Add data source

Drop or browse for up to 10 [tabular data files](#).

Browse

or

Select from project

Rob is now in AutoAI, a fully automated machine learning tool in watsonx.ai. With AutoAI, she can create a model from scratch in a no-code environment.

Click Select from project.

Configure AutoAI experiment



Credit Risk Experiment

Last saved: 00:00:00 PM

Add data source

Drop or browse for up to 10 [tabular data files](#).

or

credit_risk_training.csv
Size: 25 MB | Columns: 17  

Configure details




Create a time series forecast?

Enable this option to predict future activity (such as stock prices or temperatures) over a constant time value.



What do you want to predict?

Prediction column 

bool Risk 

Rob can easily configure details of the experiment. She decides not to create a time series forecast for this model.


She describes 'Risk' as the topic of prediction for credit default.

After quickly specifying the details, she is ready to run the experiment.


Click Run experiment.

Prediction column: Risk


CUH consumption: 37 CUH / hour

Prediction Type 

Binary classification

Positive class 

No Risk

Optimized metric 

ROC AUC

Experiment settings 

Run experiment



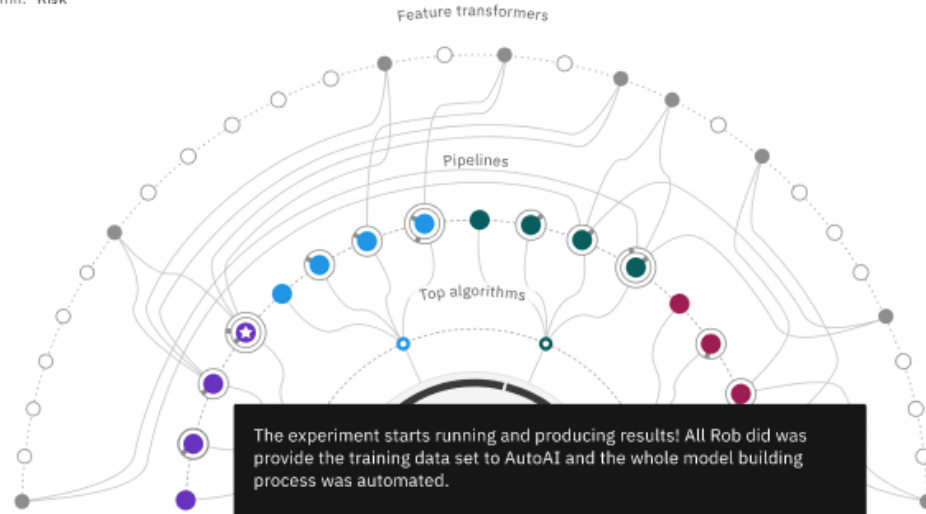
Experiment summary

Pipeline comparison

★ Rank by: ROC AUC | Cross validation score

Relationship map

Prediction column: Risk



The experiment starts running and producing results! All Rob did was provide the training data set to AutoAI and the whole model building process was automated.

AutoAI provides her with multiple pipelines, and a ranking system, which makes it easy for her to select the best model.

Click on the number 1 pipeline.

Progress map

Swap view



Experiment complete

16 pipelines generated from 4 top algorithms. See leaderboard for details.

Time elapsed: 00:00:00

View full log

Save as

Pipeline leaderboard

Rank	Name	Algorithm	ROC AUC Cross validation	ROC AUC Holdout	Enhancements	Build time
★ 1	Pipeline H-4	Gradient boosting estimator	0.882	0.891	HPO-1 FE HPO-2	Save as
2	Pipeline G-4	Random forest classifier	0.881	0.889	HPO-1 FE HPO-2	00:00:00
3	Pipeline H-3	Gradient boosting estimator	0.879	0.875	HPO-1 FE	00:00:00

Model viewer

Model information

Feature summary

Evaluation

Model evaluation

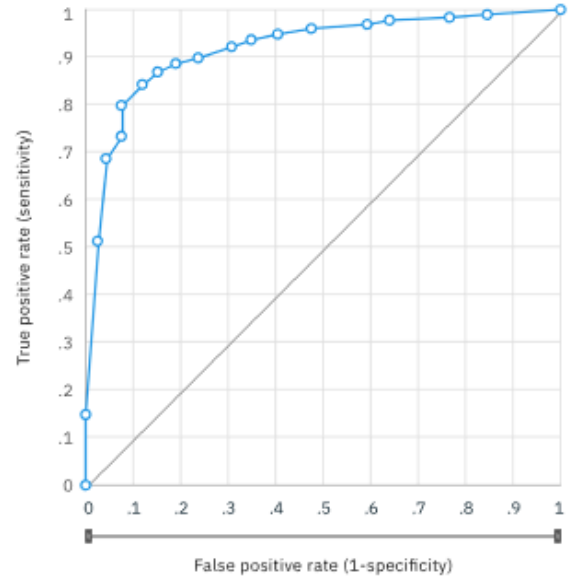
Fairness

Confusion matrix

Precision recall

Model evaluation

ROC curve



Rob views the details of the top ranked pipeline and can view multiple different evaluation metrics. She feels confident in this choice and chooses to save the pipeline as a model.

Click Save as model.

Save as model

Save as notebook

Model evaluation measures

	Holdout score	Cross validation score
Accuracy		
Area under ROC curve		

🔍 Search

New deployment +

Name	Type	Status	Tags	Last modified
------	------	--------	------	---------------

Now Rob can create a new deployment for this model in the deployment space.
Click New deployment.



Create a deployment

Use the **New deployment** button to create a new deployment for this asset.

About this model ✕

Name ✎

Credit Risk Model
Model

Description ✎

What's the purpose of this asset?

Type

wml-hybrid_0.1

Model ID

350178200009-10932-ac40-23-0001... 📄

Software specification ✎

hybrid_0.1 ⚙️

Hybrid pipeline software specifications

autoai-kb_rt22.2-py3.10

Tags

Add tags to make assets easier to find.

Last modified

1 m ago by Rob A.

Created on

Oct 31, 2023 by Rob A.

Create a deployment



Define details

Associated asset
Credit Risk Model

Deployment type

Online <input checked="" type="radio"/> Run the model on data in real-time, as data is received by a web service.	Batch <input type="radio"/> Run the model against data as a batch process.
---	--

Name

Serving name ⓘ

Description (optional)

Rob decides to deploy her model online, gives it a name, provides a short "serving name" and creates the deployment.
Click Create.

Cancel

Create

Credit Risk Model Deployment

✔️ Deployed Online

[API Reference](#) [Test](#)

Direct link

Private endpoint

Bearer <token> ⓘ

<https://us-south.ml.cloud.ibm.com/ml/v2/deployments/caf81029> 📄

IAM

Code snippets

cURL

Java

JavaScript

Python

Scala

```
1 # NOTE: you must set $API_KEY below using information retrieved from yo
2 data/ml-authentication.html)
3
4 curl --insecure -X POST --header "Content-Type: application/x-www-form-urlencoded" --header "Accept: \
5 application/json" --data-urlencode "grant_type=urn:ibm:params:oauth:grant-type:apikey" \
6 --data-urlencode "apikey=$API_KEY" "https://iam.cloud.ibm.com/identity/token"
7
8 # the above CURL request will return an auth token that you will use as $IAM_TOKEN in the scoring request below
9 # TODO: manually define and pass values to be scored below
10 curl -X POST --header "Content-Type: application/json" --header "Accept: application/json" --header "Authorization: \
11 Bearer $IAM_TOKEN" -d '{"input_data": [{"fields": [$ARRAY_OF_INPUT_FIELDS], "values": [$ARRAY_OF_VALUES_TO_BE_SCORED, \
12 $ANOTHER_ARRAY_OF_VALUES_TO_BE_SCORED]}]}' "https://private.us-south.ml.cloud.ibm.com/ml/v4/deployments/cdaf0a55-16da-457a-80b7-f34efda1462d/
13 predictions?version=2021-05-01"
```

Now, Rob can grab the model's endpoint along with multiple different code snippets that can be copied to embed into an application.

Next

Generative AI is augmenting capabilities of Traditional AI & Analytics

When to use Traditional AI capabilities

Predictive/ Prescriptive

Structured data analysis, predictions, forecasting etc.

Directed Conversational AI

Deterministic dialog flows for API driven conversational AI

Computer Vision AI

Machine Vision for object and anomaly detection

Process Automation

Robotic Process Automation, Process reengineering & optimization

Analytics

Machine Learning

Deep Learning

When to use Generative AI capabilities

Summarization eg. documents such as user manuals, asset notes, financial reports, etc.

Conversational Search eg. SOPs, troubleshooting instructions, etc.

Content creation eg. personas, user stories, synthetic data, generating images, personalized UI, marketing copy, email/social responses etc.

Code creation eg. Code co-pilot, code conversion, create technical documentation, test cases etc.

 OpenAI ChatGPT  Microsoft 
 IBM  Google  Meta Open Source

Foundation Models

Large Language Models

Most use cases with Text/ Image/ Video/ Code generation are good candidates for Generative AI

Most structured data analysis, prediction and prescription are better served with Traditional AI

Generative AI can augment existing Traditional AI use cases to enhance natural language interactions and summarize etc.

Generative AI



**Dido
Atanasov**

Senior Architect,
IBS



LLM capabilities

1 Retrieval-Augmented Generation (RAG)

Based on a set of documents or dynamic content, create a chatbot or a question-answering feature grounded on specific content.

E.g., building a Q&A resource from a broad knowledge base, providing customer service assistance

2 Summarization

Transform text with domain-specific content into personalized overviews, capturing key points

E.g., sales conversation summaries, insurance coverage, meeting transcripts, and contract information

3 Content Generation

Generate text content for a specific purpose.

E.g., content creation for marketing campaigns, job descriptions, blog posts and articles, and email drafting support

4 Named Entity Recognition

Identify and extract essential information from unstructured text

E.g., audit acceleration, SEC 10K fact extraction

5 Insight Extraction

Analyze existing unstructured text content to surface insights in specialized domain areas.

E.g., medical diagnosis support, user research findings

6 Classification

Read and classify written input with as few as zero examples

E.g., sorting of customer complaints, threat & vulnerability classification, sentiment analysis, and customer segmentation



IBS Retrieval Augmented Generation

Please upload one file type at a time and delete the file if switching types of files.

Upload a PDF File



Drag and drop file here
Limit 200MB per file • PDF

Browse files

Upload a TXT File



Drag and drop file here
Limit 200MB per file • TXT

Browse files

Question

Answer the question

Finale...



Cyber Goddess

Svilen Stanchev's
Executive Assistant



A reminder:

**“Artificial intelligence is
no match for natural
stupidity”**

