

Intro to Cognitive Project Management for AI (CPMAI)

How To Apply Best Practices Methodologies for AI Project Success

Presented by Cognilytica Analysts:

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Cartoon illustrations by Timo Elliott (timoelliott.com)

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About Cognilytica

- Training, Certification, and Research on emerging tech best practices focused on **artificial intelligence, machine learning, automation, big data,** and **advanced analytics.**
- Developed the Cognitive Project Management for AI (CPMAI) certification, with thousands certified since 2017
- Thousands of clients in public and private sector
- Kathleen Walch and Ron Schmelzer are **Managing Partners** of Cognilytica



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80%+ of AI Projects Fail

- According to TechRepublic, 85% of AI projects eventually fail to bring their intended results to the business.
- According to Gartner, 85% of Machine Learning (ML) projects fail.
- According to IDC, most organization polled reported failures among their AI projects, with a quarter of them reporting up to a 50% failure rate
- According to a report from the Project Management Institute, only about 70% of all projects completed in 2017 met original goals and business intent.



***It's not bad technology or bad people that's the problem
It's the lack of following best practices***

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Lesson Learned from Failed AI Projects



*AI projects are NOT
like traditional
software
development projects*

AI is Not About Application Development

AI is not about application development!

It's about data

- The code is a small part of making AI work. *And not even the most important part*

If you run your AI Projects like you run your Application Development Projects you're going to find out the hard way that it won't work.



timoelliott.com

*"I'm just off
to the bank..."*



Futurism



BIG OUCH | 5. 6. 19 by KRISTIN HOUSER

Investor Sues After an AI's Automated Trades Cost Him \$20 Million

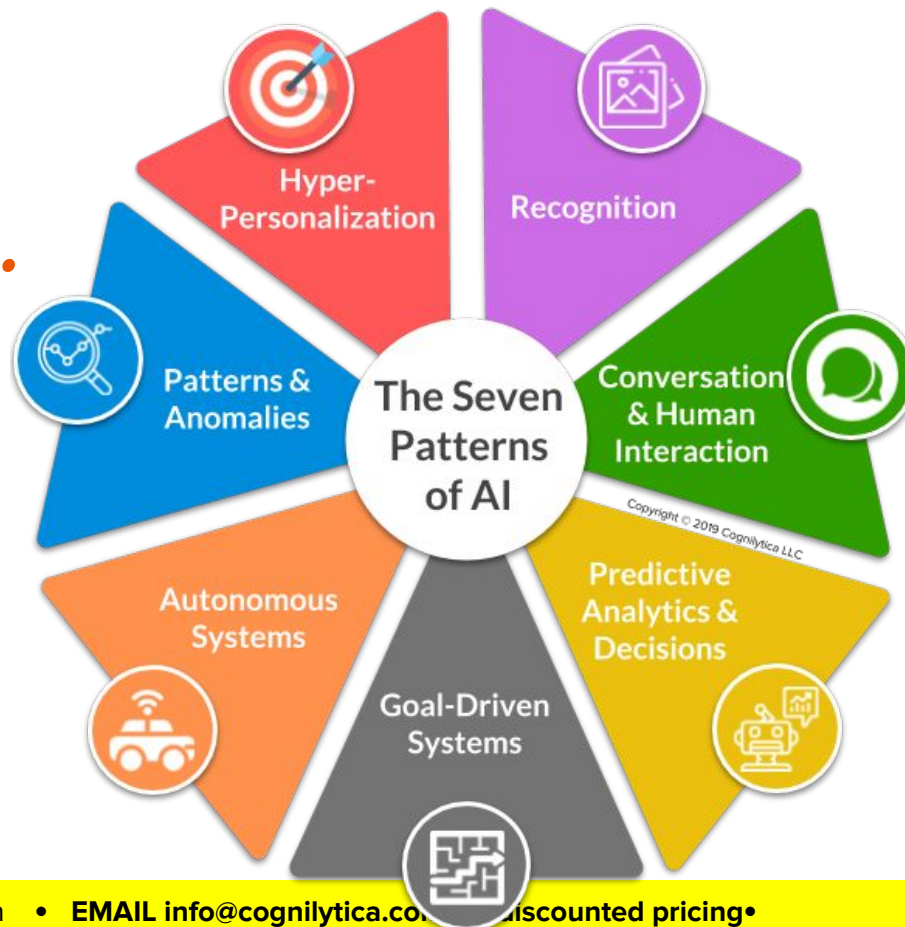
The first-of-its-kind case could shape the future of AI legislation.

/ Artificial Intelligence / Finance / Hedge Fund / Investment



Not all AI is the Same...

*The Seven Patterns of AI...
... driven by the data*



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CPMAI: Best-Practice Methodology for AI Project Success

- *The data-centricity of CRISP-DM*
- *Adds specific details for cognitive technology projects*
- *Leverages the Seven Patterns of AI*
- *Agile & Iterative*



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Lesson Learned from Failed AI Projects



***Round Peg in a
Square Hole:
The ROI is not
justified by the
project***

BUSINESS TECH ROBOT

Walmart is giving up on shelf-scanning robots in favor of humans

The retail giant has ended a contract with Bossa Nova Robotics

By James Vincent | Nov 3, 2020, 6:45am EST

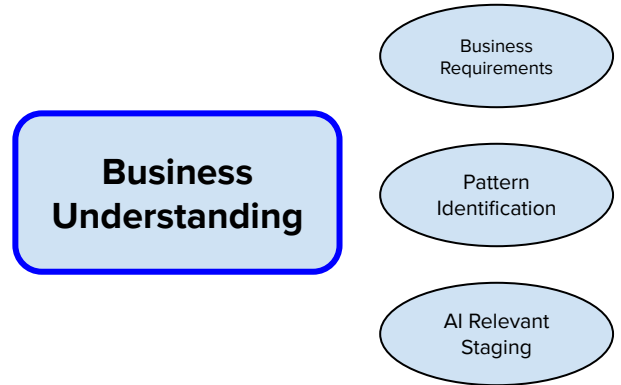


Photo by Rick T. Wilking/Getty Images

CPMAI Phase I: Business Understanding

Answer the fundamental questions and perform tasks:

- What problem are we attempting to solve?
- Should we solve this problem with AI / Cognitive Technology?
- What portions of the project require / do not require AI?
- What AI patterns are we implementing?
- What are the criteria for project success?
- What requirements are needed to complete the project?
- What other important considerations are there for the AI project?
- What skills are necessary for successful project completion?



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Lesson Learned from Failed AI Projects



***Data Quantity Issues
(and a lack of data
understanding)***

RETAIL

Amazon scraps a secret A.I. recruiting tool that showed bias against women

PUBLISHED WED, OCT 10 2018-6:15 AM EDT | UPDATED THU, OCT 11 2018-2:25 PM EDT

 REUTERS

KEY POINTS

- Amazon.com's machine-learning specialists uncovered a big problem: their new recruiting engine did not like women.
- The team had been building computer programs since 2014 to review job applicants' resumes with the aim of mechanizing the search for top talent, five people familiar with the effort told Reuters.
- The company's experimental hiring tool used artificial intelligence to give job candidates scores ranging from one to five stars — much like shoppers rate products on Amazon, some of the people said.



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CPMAI Phase II: Data Understanding

Answer the fundamental questions and perform tasks:

- What data are necessary to achieve the objectives?
- What is the quantity and quality of our data?
- What internal and external data is necessary?
- What requirements to augment existing data?
- What are the requirements for ongoing data gathering and preparation?
- What are the requirements for technology for data manipulation and transformation?
- What other important data-relevant considerations are there for the AI project?

**Data
Understanding**

Data Sources

Data Quality

Data
Environment

Lesson Learned from Failed AI Projects



Data Quality Issues



Futurism



\$1B MISTAKE | 4. 23. 19 by KRISTIN HOUSER

Teen Says Apple's Facial Recognition Got Him Wrongfully Arrested

He's now suing the company for \$1 billion.

/ Artificial Intelligence / Apple / Facial Recognition / Lawsuit

MIT Technology Review

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ARTIFICIAL INTELLIGENCE

Error-riddled data sets are warping our sense of how good AI really is

Our understanding of progress in machine learning has been colored by flawed testing data.

By Karen Hao

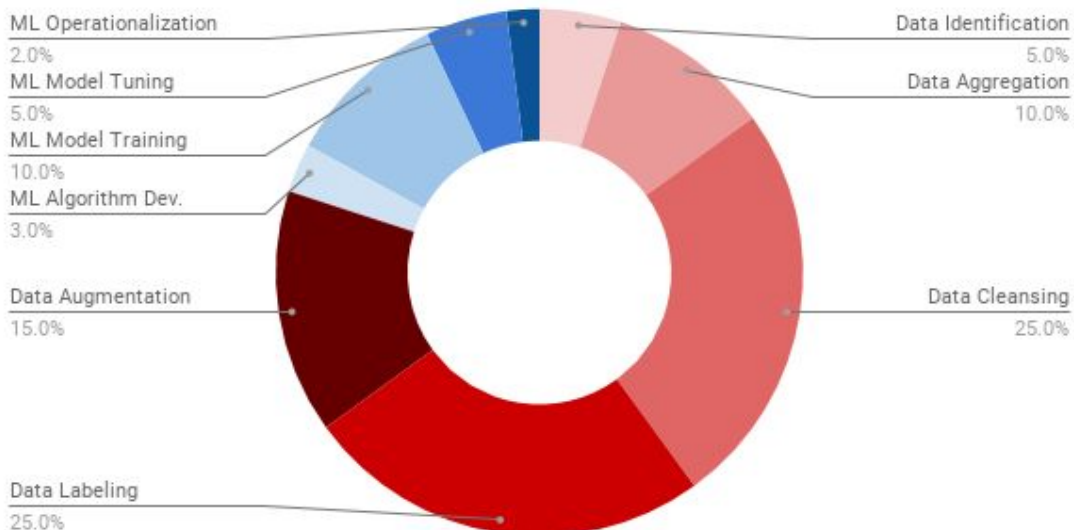
April 1, 2021



80% of AI Projects are Data Engineering

Percentage of Time Allocated to Machine Learning Project Tasks

Source: Cognilytica



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CPMAI Phase III: Data Preparation

Answer the fundamental questions and perform tasks:

- How must data be transformed to meet requirements?
- Implementation of data cleansing, transformation, and manipulation
- Iterations of the data engineering pipeline
- Means by which data quality can continuously be monitored and evaluated
- Use, extension, and modification of third-party data
- Human-involved data annotation and manipulation (“labeling”)
- Performance of additional data augmentation steps

Data Preparation

Data Wrangling

Data Cleansing

Data Labeling

Lesson Learned from Failed AI Projects



***You're Taking
too Long.

The Proof of
Concept Trap.***



The Sun

TECH | TRAVEL | MOTORS | PUZZLES | SUN BINGO | SUN VOUCHER

Tech > Science

ROBOSTOP Facebook shuts off AI experiment after two robots begin speaking in their OWN language only they can understand

Experts have called the incident exciting but also incredibly scary

CPMAI Phase IV: Model Development

Answer the fundamental questions and perform tasks:

- How can the data be transformed into a machine learning model that meets the project requirements?
- Performance of model training activities
- Performance of model optimization activities
- Determination of appropriate algorithms, settings, and hyperparameters
- Creation of ensemble models
- Use of third-party models or extensions of models
- Model development as appropriate for selected machine learning technique

Data Modeling

Algorithm
Selection

Model
Training

Model Tuning

Lesson Learned from Failed AI Projects



***The Real World
Doesn't Match
your Model.***

IEEE Spectrum / Andrew Ng X-Rays the AI Hype 🔍 Type to search

NEWS | ARTIFICIAL INTELLIGENCE

Andrew Ng X-Rays the AI Hype > AI pioneer says machine learning may work on test sets, but that's a long way from real world use

BY [TEKLA S. PERRY](#) | 03 MAY 2021 | 2 MIN READ | 📄



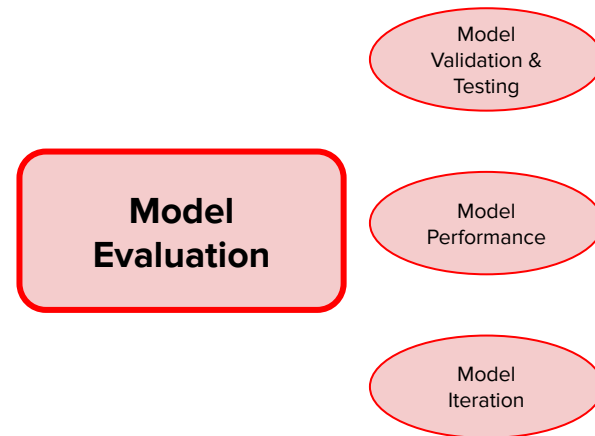
“It turns out,” Ng said, “that when we collect data from Stanford Hospital, then we train and test on data from the same hospital, indeed, we can publish papers showing [the algorithms] are comparable to human radiologists in spotting certain conditions.”

But, he said, “It turns out [that when] you take that same model, that same AI system, to an older hospital down the street, with an older machine, and the technician uses a slightly different imaging protocol, that data drifts to cause the performance of AI system to degrade significantly. In contrast, any human radiologist can walk down the street to the older hospital and do just fine.

CPMAI Phase V: Model Evaluation

Answer the fundamental questions and perform tasks:

- Does the model meet requirements for accuracy, precision, and other metrics?
- Determining and evaluating concerns on overfit and underfit of models
- Evaluation of training, validation, and test curves for overall acceptability
- Evaluation of models against business Key Performance Indicators (KPIs)
- Determination of model suitability with regards to operationalization approach
- Determination of means for model monitoring
- Determination of means for model iteration and versioning



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Lesson Learned from Failed AI Projects



*AI Project lifecycles
are continuous --
don't forget
retraining (and
model / data drift)*

Tay, Microsoft's AI chatbot, gets a crash course in racism from Twitter

Attempt to engage millennials with artificial intelligence backfires hours after launch, with TayTweets account citing Hitler and supporting Donald Trump

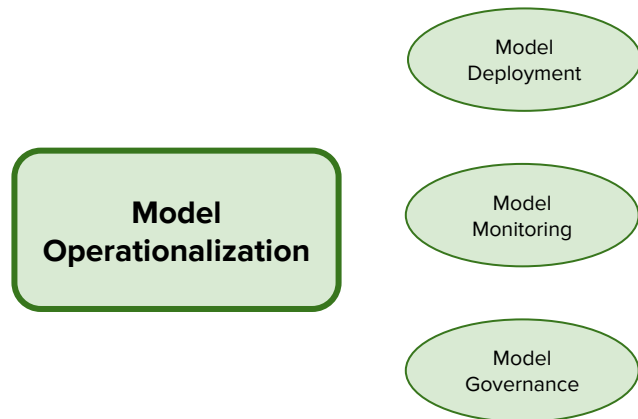


 Tay uses a combination of artificial intelligence and editorial written by a team including improvisational comedians. Photograph: Twitter

CPMAI Phase VI: Model Operationalization

Answer the fundamental questions and perform tasks:

- How will this model be used in production / operational environments?
- What are the requirements for data flow for model to be useful?
- What are the requirements for performance?
- Operationalization of model in different environments
- Implementation of model monitoring
- Implementation of model versioning and governance
- Evaluation of business performance
- Determination of project success and iteration requirements



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Lesson Learned from Failed AI Projects



Trusting the Vendors Too Much

*(Product mismatch,
Overhype, and Oversell)*


SLATE News & Politics Culture Technology Business Human Interest

EMITTING AN EXTREMELY WEARY AND AUDIBLE SIGH

future tense

How IBM's Watson Went From the Future of Health Care to Sold Off for Parts

BY LIZZIE O'LEARY JAN 31, 2022 • 9:00 AM



Watson

THE WALL STREET JOURNAL.



ERIK CARTER

Tech Giants Pour Billions Into AI, but Hype Doesn't Always Match Reality

Google, Meta and OpenAI are investing heavily in the technology, which is increasingly capturing the public imagination

By [Karen Hao](#) and [Miles Kruppa](#)
Updated June 29, 2022 9:33 am ET

Number One Lesson Learned from Why AI Projects Fail

Overpromising and Underdelivering

- Do you even know what problem you're trying to solve?
- Why are you tackling the hardest possible problem first?
- Why are you trying to tackle many AI Patterns at the same time?

Think Big. Start Small. ITERATE OFTEN.

This is the recipe for success.

Self-driving Uber car that hit and killed woman did not recognize that pedestrians jaywalk

The automated car lacked "the capability to classify an object as a pedestrian unless that object was near a crosswalk," an NTSB report said.



CPMAI™ Certification

Get the fastest growing AI Project Management Certification

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- ➔ Detailed, Relevant, Continuously Updated, and In-depth
- ➔ Provides a foundation in AI, ML, data, and automation
- ➔ Leverage & Extend Agile, CRISP-DM, and Existing Certifications and Skills
- ➔ Trusted, High Value, High ROI - Make yourself competitive in the market
- ➔ Certification, Training, Workbook, Training Materials and Exercise fees included with price

CPMAI™

Cognitive Project Management for Artificial Intelligence Methodology

Best Practices Methodology for Implementing Successful AI, Machine Learning, and Cognitive Technology Projects

Learn more at:

cognilytica.com/cpmai

Some of the organizations that have completed Cognilytica Education:



Thank You!

Presenters:

Kathleen Walch & Ronald Schmelzer

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