Competitive Product Analysis

Inputs for the Analysis

All the information presented below is from the following sources:

- Each company's website
- Company's demos/tutorials (when available)
- Company's Youtube Demos
- Google Search
- Social Media

Objectives of the Analysis

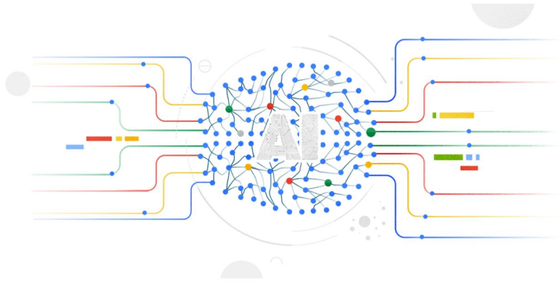
- List the competitive products/services and what they offer.
- Analyze the communication methods of the competition.
- Reflect on our advantages and disadvantages towards them.
- Fill in the gap between PyThia and those competitive products/services.

Arthur

fiddler

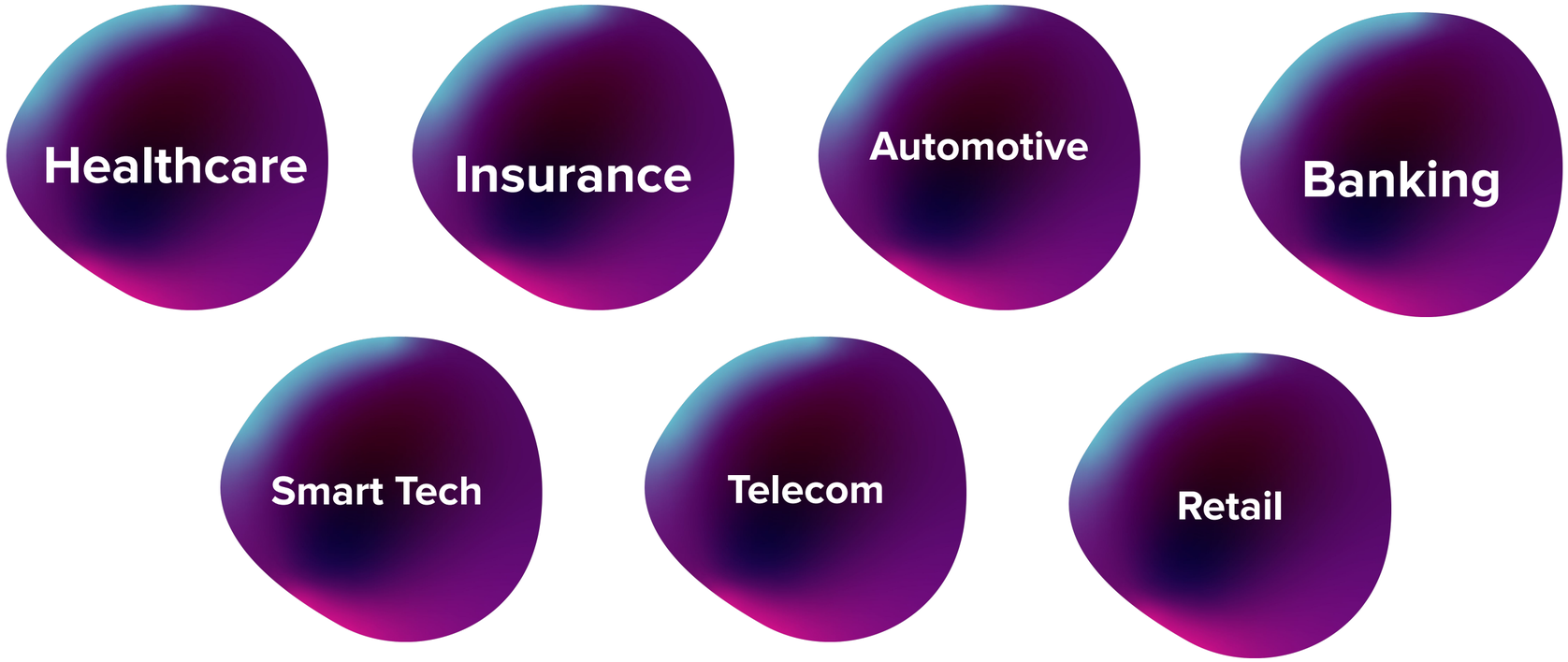
IBM Watson

Amazon SageMaker



CORTEX CERTIFAI

Industries in which the competition is active



Industries in which the competition is active

	Arthur AI	Fiddler AI	Cortex Certifai	Watson Openscale	Explainable AI	SageMaker Clarify	PyThia
Healthcare	✔		✔			✔	✔
Insurance		✔	✔	✔			
Automotive	✔						
Banking	✔	✔	✔	✔			
Smart-Tech					✔		✔
Telecom		✔				✔	
Retail						✔	

Most common use cases per industry

	Healthcare	Insurance	Automotive	Banking	Smart-Tech	Telecom	Retail
Object Recognition			✔		✔		
Credit Rick		✔		✔			✔
Fraud Detection		✔		✔		✔	
Churn Detection				✔		✔	✔
Underwriting		✔					

How are customers meeting their needs right now

- Explaining the model and how it operates.
- Identifying and addressing bias phenomena.
- Gradually confronting problems associated with data drift and bias that may be contained in the data.
- More comprehensive model solutions are now available addressing more phases of the MLOps lifecycle, such as in Production.

Who is the user of each tool?

→ Unfortunately, we only have information about their end users for only two of the tools.

Cortex Certifai Toolkit for Data Scientists.

DevOps IT Team

Comparative Matrices

Competition’s Key Features

	Arthur AI	Fiddler AI	Cortex Certifai	Watson Openscale	Explainable AI	SageMaker Clarify	PyThia
Models Overview		✔	✔	✔			
Models Insights		✔	✔	✔			
Monitor		✔		✔			
Performance	✔		✔	✔			
Explainability	✔	✔	✔		✔	✔	✔
Fairness/Bias	✔		✔	✔	✔	✔	✔
Robustness			✔				
Ground Truth Labels					✔		

Competition’s Bias Approach

	Arthur AI	Fiddler AI	Cortex Certifai	Watson Openscale	Explainable AI	SageMaker Clarify	PyThia
Detecting Bias	✔		✔	✔	✔	✔	✔
Mitigating Bias	✔			✔			

Competition’s Bias Metrics

Unfortunately, only Amazon’s SageMaker Clarify gives us insights about the bias metrics it uses:

01

Class Imbalance (CI)

02

Difference in Positive Proportions in Labels (DPPL)

03

Kullback-Leibler Divergence (KL)

04

Jensen-Shannon Divergence (JS)

05

L-p Norm (LP)

06

Total Variation Distance (TVD)

07

Kolmogorov-Smirnov Distance (KS)

08

Conditional Demographic Disparity in Labels (CDDL)

09

Difference in Positive Proportions in Predicted Labels (DPPL)

10

Disparate (Adverse) Impact (DI)

11

Difference in Conditional Acceptance (DCA)

PESTL Analysis

PESTL Analysis

- A management method whereby an organization can access major external factors that influence its operation in order to become more competitive in the market.
- Used in conjunction with SWOT Analysis.

PESTL Analysis

- Stable Political environment.
- Artificial Intelligence can be a threat to democratic institutions.
- Governments are slow on the uptake of new tech. Legislations around technology, automation and need for privacy make our technology a necessity more than ever. For example, according to European Commission's official website, the Commission is proposing the first ever legal framework on AI, which addresses the potential high risks it poses to safety and fundamental rights equally. You can learn more here.

PESTL Analysis

- Economic stability and growth.
- High funding of the Digital Transformation in the public and private sector.
- Funding opportunities about AI by the European Commission boosting R&D investments.

PESTL Analysis

- More personalization is on the horizon as AI drives internet giants such as Google, Alibaba, and Amazon to deliver more tailored experiences to its users.
- AI-powered tools and bots.
- The F.Acc.T. principles (Fairness, Accountability & Transparency) are becoming more and more essential, since machines are asked to make more and more decisions on behalf of humans.

PESTL Analysis

→ With automation comes increased work output.

PESTL Analysis

- Artificial Intelligence lets lawyers take more data-driven approaches to their practices. Overall, it offers efficiency.

Porter’s Five Forces

Porter’s Five Forces

- In order for an organization to be able to defeat its rival companies, a general examination of the external forces influencing the organization itself is essential.
- The objective of such an analysis, combined with a SWOT analysis, is to investigate how our organization needs to form its strategy in order to develop opportunities in its environment and protect itself against competition and other threats.

Porter’s Five Forces

Poses a threat if and only one or more of these conditions exist:

- there are only a few suppliers
- there are no substitutes for the supplies they offer
- supplier’s prices form a large part of the total costs of the organization
- a supplier can potentially undertake the value-added process of the organization.

Porter’s Five Forces

Buyers have more bargaining power under the following conditions:

- they are concentrated and there are a few of them
- the product of the organization is undifferentiated
- backward integration is possible
- the selling price of the organization is unimportant to the total costs of the buyer.

Porter’s Five Forces

The threat of potential new entries

- When the profit margins are attractive and the barriers to entry are low.

Porter’s Five Forces

- Occasionally, substitutes render a product redundant.
- More often, substitutes do not entirely replace existing products but introduce new technology or reduce the costs of producing the same product.

Porter’s Five Forces

The extent of competitive rivalry

In highly competitive markets, like ours, companies engage in regular and extensive monitoring of key competitor companies and focus on areas like:

- examining price changes
- examining any rival product change in great detail and regularly attempting new initiatives themselves
- watching investment in new competing plants etc

Risk of entry by potential competitors L

- Complex regulatory issues H
- Infrastructure costs M/H
- Number of Players M
- Rapidly changing technology M/H
- High licenses fees M

Bargaining power of suppliers M

- Few major players M
- High switching H
- Supplier Size M
- Independence among Players M
- Differentiation M

Rivalry among established firms with similar business models H

- Open market for competition H
- Less or no brand loyalty for specific product M/H
- Little differentiation other than cost/price H
- Large players H

Bargaining power of customers H

- Lack of differentiation among service providers H
- High competition M
- Tendency to Switch L
- Lack of brand loyalty H

Threat of substitute products H

- Social networks – H
- Law Firms - H

Rivalry: increased by large players which dominate the market and benefit from economies of scale.
Buyer power: increased by: 1) the existence of large corporate buyers, exercising significant financial muscle and could negatively impact upon a player's revenue if they decided to change companies, 2)the fact that many players in the market engage in competitive price
Suppliers power: Suppliers, such as IBM/Watson and Google, are large and small in number, which increases their power.
Threat of new entries: entry is possible, despite the size of the existing players.

Small Businesses VS Long-established Companies

Niche Down

On a chosen market segment.

1. Recognizing and defining our basic customer
2. Forming a marketing strategy

→ Quick sales

→ Personalized customer experience

→ Clientele growth

Differentiators

- Model - agnostic
- MASHAP Technology
- Customer interaction (feedback)

Pop up from the crowd

Create a product/service that makes stands out.

- Simplified solution
- Clear roadmap
- Appealing UI
- Pricing
- Storytelling

Customer experience

Great customer experience and relationship.

- Run excellent trials
- Getting feedback from the customer
- Advisor service

SWOT Analysis

SWOT Analysis

Internal factors that affect only the company, such as:

- financial
- physical
- human resources
- access to natural resources (trademarks, patents, copyrights) current processes (employee programs, department hierarchies and software systems).

External forces that affect all the organizations, such as:

- market trends
- economic trends
- funding
- demographics
- political regulations
- environmental regulations
- economic regulations

SWOT Analysis

Strengths	Weaknesses
• Competent and flexible team - can communicate, adapt & change quickly. • The MASHAP technology is a differentiator. • Infrastructure-agnostic. • Cost-effective solutions.	• Using only one bias metric so far and no clear product roadmap. • Need for better promotional strategy/communication of our technology. • Low brand awareness.
Opportunities	**Threats**
• Digital transformation is happening in public and private sectors. • We can take advantage of the team's PR to skyrocket. • Upcoming regulations and compliances make what we offer even more essential. • Existing customer base in Insurance, Banking, Telecom which we can leverage. • Acquired by a big company.	• Long-established technology companies can pose an intense rivalry. • Legislation delays in "Trustworthy AI". • Delays in PyThia release. • Delays in getting on board our first customer. • Acquired by a big company.

Communication

Social Media

	Linkedin	**Twitter**	Facebook	Youtube	Medium	Crunchbase
Arthur AI	✔	✔	✔		✔	✔
Fiddler	✔	✔	✔			✔
Cortex Certifai	✔	✔	✔	✔		✔
Openscale (as IBM Watson)	✔	✔		✔		
Explainable AI (as Google Cloud)	✔	✔		✔		
SageMaker Clarify (as AWS)	✔	✔		✔		

Conveying the Key Message

Emphasizing the following points

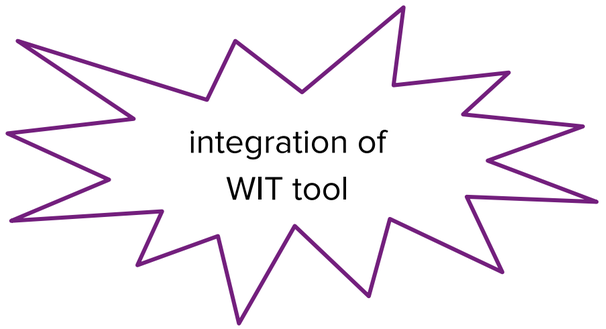
- Professional fields where they are active: describing all the business sectors in which they do business (e.g. Banking, Insurance, Healthcare etc)
- Use Cases/Testimonies: of already existing clients talking about their experience with the product / company
- List of their clients
- Their added value: basically emphasizing the problems they solve and how this is important for an organization
- The way(s) their product is integrated in the workflow of an organization

My Suggestions

Technical Suggestions

- Models Overview: aiming to give basic information on the models that have already been used. **M**
- Basic insights for each model, such as: ID, name, date created, task. **M**
- Provide E.D.A (Exploratory Data Analysis): demographics of the dataset used in the model. **H**
- Monitoring: informs us about data drift, data outliers and (customized) alerts. **H**

- Model Performance: information about metrics like accuracy, f1 score, precision, recall, feature performance. **H**



Prioritization:

- **H:** High
- **M:** Medium
- **L:** Low

Technical Suggestions

- Explainability section. **H**
- Both Bias detection and Bias mitigation. **H**

- Create a great / innovative UI. **M**
- Extract reports in PDF form. **L**

Business Suggestions

- Restructuring of C4T's website, in order to integrate the propositions mentioned in the Communication section.
- Recording of a demo/use case with the PyThia tool and upload it on YouTube.
- Incorporate a *Request a Demo* or *Get in Touch* form on the website.
- Create an account on Crunchbase.
- Besides reaching potential clients from the most apparent markets (Healthcare, Insurance etc), carefully choosing a certain market, which doesn't have any attention paid to yet, and niching down to it.
- Build a personalized customer experience strategy.

Appendix

bases on the

EthicalExplorer

Surveillance

How do we protect privacy against commercializing surveillance?

Where we stand

- Can someone use our product/service to track or identify other users?
- Is this how our tech is supposed to be used?
- Do we have privacy features that limit the collection or sharing of personally identifiable information?
- What could governments or third-party organizations do with the information we collect?

Anticipating Risk

- How might our technology be used to discriminate, oppress, or target specific groups?
- How would we respond to law enforcement or government requests for user information?

Leading the way

- What policies can we implement to ensure we balance a great user experience with protecting privacy?

Disinformation

Shared facts are under attack and dangerous disinformation is on the rise.

Where we stand

- Do we have systems in place to prevent the dissemination of falsehoods?
- Are people using our tech to subvert or attack facts?
- Are we responsible if disinformation is spread using our tech?

Anticipating Risk

- What could become the equivalent of false news, bots, or deepfakes on our platform?
- How might our tech be co-opted to undermine trust in our societal institutions?

Leading the way

- How will we promote truth?
- What might fostering an environment for facts to flourish look like in our tech?

Exclusion

Historically marginalized populations suffer higher consequences from a lack of data privacy and literacy.

Where we stand

- How did we decide who our target audience should be? Is there any possibility that we need to redefine it?
- How can we benefit from more diversity in our audience?
- Are we missing any perspectives that would provide important inputs on our product?
- How can these perspectives help us better meet our goals?

Anticipating Risk

- How would society be impacted if marginalized groups couldn’t use our product?
- How could our technology potentially be misused to harm or exclude certain populations?

Where we stand

- How might people benefit if our design and decision-making included people from historically marginalized populations?

Algorithmic Bias

As humans, we all have unconscious biases that impact algorithms, potentially causing or amplifying harm through predictive policing, hiring decisions, etc.

Where we stand

- How can we create or update our tech to avoid harm and promote neutrality?
- Do we have systems in place to limit algorithmic biases?
- What else must we consider when building and refining algorithms?

Anticipating Risk

- How could we monitor whether our product's algorithm benefits or hurts individuals, communities & societies?
- What might we do if we discovered our users have been profiled or discriminated against?

Where we stand

- How can we encourage a diverse and global community of experts on AI to counteract biases?

Addiction

Digital notifications are irresistible by design.

Where we stand

- Is our business model based on engagement?
- What might happen if our algorithms and other features promoted moderate use?
- What drives high levels of engagement in our tech?
- Is this good for the mental, physical, or social health of those who use it?

Anticipating Risk

- What might extreme use of unhealthy engagement look like with our tech?
- How might high engagement levels change people's habits or our collective social norms?

Where we stand

- What are different engagement metrics we might prioritize for user wellbeing online and offline?

Data Control

The devices and apps that help simplify people's lives can also collect vast amounts of personal data, from web browser and purchase history to keystrokes and clicks.

Where we stand

- What data are we collecting from users?
- Do we really need to collect every piece of this data?
- Do users have the option to choose what data they share with us or use our platform without being tracked?
- What is our policy and workflow if a user wants their data to be removed from our systems?

Anticipating Risk

- What could we do to make it harder for hackers to access or combine the user data we store?
- Do we collect any data that puts us at greater risk of legal liability? If yes, how are we planning to address that?

Where we stand

- Are there ways we could limit personal data collection or sharing that don't hurt our product's functionality?

Bad Actors

Digital tools enable the spread of ideas at unprecedented speed and scale, empowering bad actors disseminating malicious content.

Where we stand

- What safeguards do we have in place to minimize bad behavior?
- Can our users block or mute bad actors - and request they be banned?
- What other tools should we consider to help all of our users feel safe?

Anticipating Risk

- What crimes could arise in or around our tech?
- Without violating privacy, how could we detect and address patterns of behavior that indicate our tool is being used to organize hate or harassment?

Where we stand

- How can we prevent bad actors of all kinds from acting in the first place?

Outsized Power

Too much power in the hands of just a few creates problems. Tech has accelerated this issue by helping companies achieve market dominance at greater speed and scale.

Where we stand

- What impact does this have on our organization and the broader industry?
- Do our growth targets result in us compromising our values or harming customers, suppliers, or employees?
- Are there ways we can achieve growth that benefits us and our broader stakeholders?

Anticipating Risk

- How could we preserve our company's values - and ensure our tech isn't misused - if we're acquired?
- Do we have a path to profitability that does not include an acquisition by a dominant platform?

Where we stand

- Is it possible for us to ensure our product is interoperable with the broader market, not just tech giants?

Thank You!

Questions?

Aliki Ntouzgou, C4T Intern