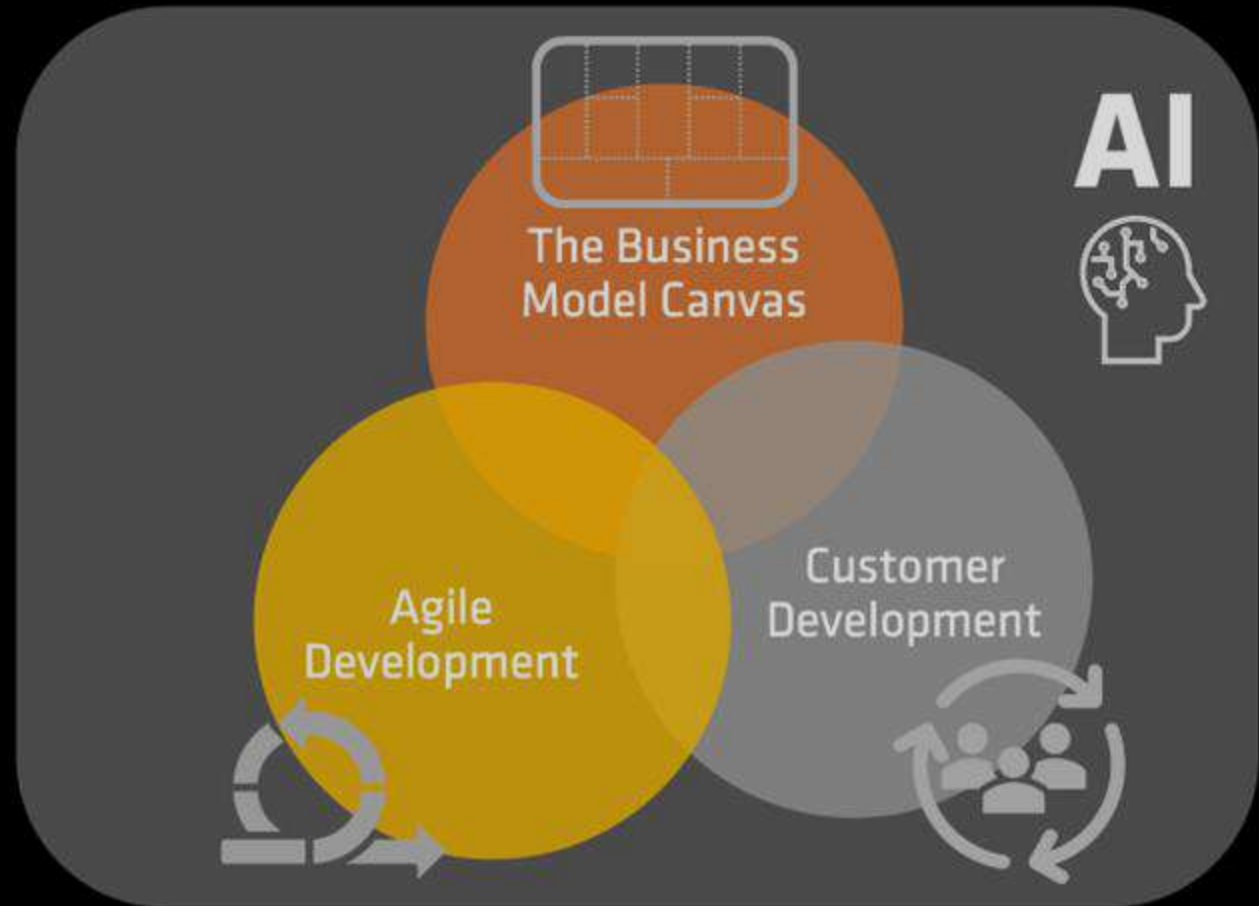


Entrepreneurship, Innovation and Technology Transfer Technology Assessment

Luis Caldas de Oliveira



TÉCNICO LISBOA

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Market Pull

Consumer needs and preferences drive the development and innovation of new products or services.



Technology Push

New innovations in technology drive the development and introduction of new products or services

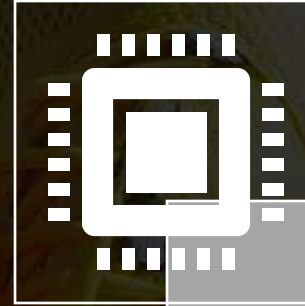


Driving Forces



Market Pull

- Consumer demands and market needs



Technology Push

- Technological advancements and R&D capabilities

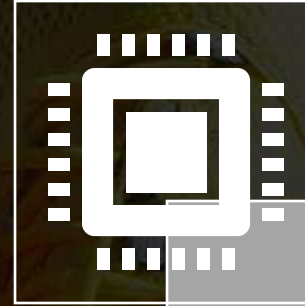


Innovation Type



Market Pull

- Incremental innovations on existing products



Technology Push

- Create new markets or disrupt existing ones

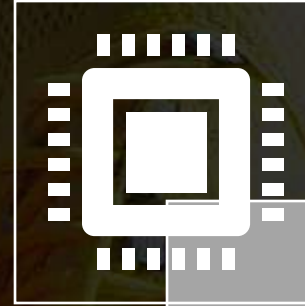


Risk Level



Market Pull

- Lower risk as it responds to known demands



Technology Push

- Uncertainty about market acceptance

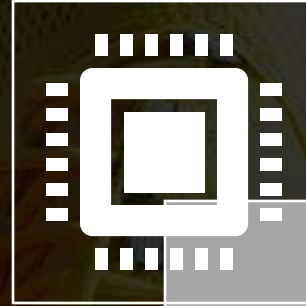


Time Frame for Adoption



Market Pull

- Addresses immediate needs



Technology Push

- Often requires changing behaviors



Examples



Market Pull

- Electric Vehicles



Technology Push

- The Internet



The Technology Push Process

Technology
definition and
communication

Identification of
technology
features

Identification of
application
areas

Decision for
one
opportunity

Map the
customer
ecosystem



Use your computer or mobile phone



The Technology Push Tool

[Click to Copy](#)

1 Technology Definition and Communication

Technology: Write the name of the technology here

One-paragraph definition:

Write a definition of your technology for non-experts here

Prompt: You are an expert in (your technology here) technology, and you want to push that technology to the market. You need to clearly define the technology in a way that non-experts can understand to facilitate engagement with stakeholders and show experts in commercialization and market development to apply their knowledge effectively. Write, in less than 5 sentences, a simplified but accurate definition that helps identify broader market opportunities and ensures consistent understanding among all parties, reducing misinterpretation.

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1

2 Technology Features: Components and Functions

Technology: Write the name of the technology here

Basic Components & Building Blocks:

- Write a list of the basic components and building blocks of the technology here

Functions & Tasks

- Write a list of the functions and tasks the technology can perform here

Prompt: You are an innovator who wants to bring an innovative technology to the market. In the technology push process, you need to list the basic components and building blocks of the technology and a list of the functions and tasks the technology can perform. Generate bullet points with only the titles of the two lists for (your technology here) technology.

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2

3 Technology Features: Mind Map

Technology: Write the name of the technology here

Mind Map of Technology Features:

Import the text file with Google.it to create an image of the mind map and include it here

Prompt: You are an innovator who wants to bring an innovative technology to the market. In the technology push process, before the identification of the applications of the technology, you need to understand the features of the technology. Generate a mind map to organize and visualize the features of the (your technology here) technology. Show the mind map. Next, generate a plain text version with tabs for indentation ready for download.

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3

4 Technology Applications: Mind Map

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Mind Map of Technology Applications:

Import the text file with Google.it to create an image of the mind map and include it here

Prompt: You are an innovator who wants to bring an innovative technology to the market. In the technology push process, after the technology features identification, you need to identify the technology applications. Generate a mind map to organize and visualize the applications of the (your technology here) technology. Show the mind map. Next, generate a plain text version with tabs for indentation ready for download.

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5 Decision for One Opportunity

Technology: Write the name of the technology here

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Score
Application 1						
Application 2						
Application 3						

Prompt: You are a startup founder who wants to bring an innovative technology to the market. In the technology push process, after the identification of the technology applications, you need to select the most promising technology applications. Generate a list of the five most relevant criteria to rank the applications of (your technology here) technology. Do not forget to include the experience of the team in the area of each application and time to market. Use the five criteria on the head of a decision matrix, in markdown format, for the following applications of the technology (your applications here). Leave a column at the end for the score.

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6 Identify Key Stakeholders, Needs and Pains

Technology and Application: Write the name of the technology and selected application here

	Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4	Stakeholder 5
Stakeholder Type	user, payer, influencer, gatekeeper, etc.				
Stakeholder Needs					
Stakeholder Pains					

Prompt: You are a startup founder who wants to bring an innovative technology to the market. In the technology push process, after selecting the most promising technology applications, you need to identify the key stakeholders, their needs, and pains. Generate a list of the five most relevant key stakeholders for the use of (your technology here) (your application). Use the five stakeholders as the head of a table. The first row classifies the stakeholder type (user, payer, influencer, gatekeeper, etc.), the second row the stakeholder's needs, and the third row the stakeholder's pains. Fill the table with reasonable content.

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6



Internet of Things Technology Push

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1 Technology Definition and Communication

Technology: **Internet of Things**

One-paragraph definition:

The Internet of Things (IoT) refers to a network of interconnected physical devices, including sensors, actuators, and user interfaces, that communicate and exchange data over the Internet. These devices can sense their environment, including humans, and monitor and control machines used in a wide range of applications. They are often designed to operate on low power, allowing for battery operation or energy harvesting. Data collected by IoT devices can be stored in the cloud, with processing taking place on both edge and cloud computing units to enhance performance, responsiveness, and privacy. This technology facilitates interaction and automation by providing real-time data and control, making it easier to implement across diverse applications.

Prompt: You are an expert in the Internet of Things technology, and you want to push that technology to the market. You need to clearly define the technology in a way that non-experts can understand to facilitate engagement with stakeholders and allow experts in commercialization and market development to apply their knowledge effectively. Write, in less than 5 sentences, a simplified but accurate definition that helps identify broader market opportunities and ensures consistent understanding among all parties, reducing misinterpretation.

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1

Technology Features: Components and Functions

Technology: **Internet of Things**

Basic Components & Building Blocks:

- Sensors
- Actuators
- Connectivity Modules
- Edge Computing Units
- Cloud Computing Units
- Data Storage Units
- User Interfaces
- Power Sources
- Security Modules

Functions & Tasks

- Data Collection
- Automation and Control
- Data Transmission
- Real-Time Data Analysis
- Long-Term Data Analysis
- Remote Monitoring
- Real-Time Alerts
- System Integration

Prompt: You are an innovator who wants to bring an innovative technology to the market. In the technology push process, you need to list the basic components and building blocks of the technology and a list of the functions and tasks the technology can perform. Generate bullet points with only the titles of the two lists for the Internet of Things technology.

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2

Technology Features: Mind Map

Technology: **Internet of Things**

Mind Map of Technology Features:

Prompt: You are an innovator who wants to bring an innovative technology to the market. In the technology push process, before the identification of the applications of the technology, you need to understand the features of the technology. Generate a mind map to organize and visualize the features of the Internet of Things technology. Show the mind map. Next, generate a plain text version with tabs for indentation ready for download.

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Technology Applications: Mind Map

Technology: **Internet of Things**

Mind Map of Technology Applications:

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4

5 Decision for One Opportunity

Technology: **Write the name of the technology here**

	Market Potential	Competitive Advantage	Team Experience	Time to Market	Scalability	Score
Smart Homes	Low (0)	Low (0)	High (1)	High (1)	High (1)	3
Healthcare	High (1)	Low (0)	Low (0)	Low (0)	High (1)	2
Industrial IoT	High (1)	High (1)	High (1)	High (1)	Low (0)	4

Prompt: You are a startup founder who wants to bring an innovative technology to the market. In the technology push process, after the identification of the technology applications, you need to select the most promising technology applications. Generate a list of the five most relevant options to rank the different applications of the Internet of Things technology. Do not forget to include the experience of the team in the area of each application and time to market. Use the five criteria as the head of a decision matrix, in markdown format, for the following applications of IoT: Smart Homes, Healthcare, and Industrial IoT. Leave a column at the end for the score.

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5

6 Identify Key Stakeholders, Needs and Pains

Technology and Application: **Write the name of the technology and selected application here**

Stakeholder	Operations Manager	IT Manager	Maintenance Team Lead	Financial Officer	Regulatory Compliance Officer
Type	User	Influencer	User	Player	Gatekeeper
Needs	Improve efficiency and reduce downtime through real-time monitoring and analytics.	Ensure seamless integration with existing IT infrastructure and data security.	Access to predictive maintenance tools to prevent equipment failure.	Cost-effective solutions that demonstrate clear ROI.	Solutions that comply with industry standards and regulations.
Pains	Struggles with unplanned downtimes affecting productivity.	Concerns about data breaches and system compatibility issues.	Frequent equipment failures leading to increased repair costs and downtime.	High initial investment without guaranteed returns can be a barrier.	Risk of non-compliance leading to fines or operational shutdowns.

Prompt: You are a startup founder who wants to bring an innovative technology to the market. In the technology push process, after selecting the most promising technology application, you need to identify the key stakeholders, their needs, and pains. Generate a list of the five most relevant key stakeholders for the use of the Internet of Things technology for industrial applications. The list should include the "operations manager". Use the five stakeholders as the head of a table. The first row classifies the stakeholder type (user, player, influencer, gatekeeper, etc.), the second row the stakeholder's needs, and the final row the stakeholder's pains. Fill the table with one-sentence entries.

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6



Technology Definition and Communication

Define your technology for non-experts
(including AI)



Start with AI

You are an expert in the Internet of Things technology, and you want to push that technology to the market. You need to clearly define the technology in a way that non-experts can understand to facilitate engagement with stakeholders and allow experts in commercialization and market development to apply their knowledge effectively. Write, in less than 5 sentences, a simplified but accurate definition that helps identify broader market opportunities and ensures consistent understanding among all parties



The Internet of Things (IoT) connects everyday devices to the Internet, allowing them to send and receive data. These devices, **equipped with sensors and software**, can monitor and automate tasks, improving efficiency and decision-making. IoT transforms objects like home appliances, vehicles, and industrial equipment into smart devices, creating opportunities for innovation in areas such as **healthcare, agriculture, and smart cities**. By enabling real-time data exchange, IoT helps businesses optimize operations and enhances convenience in daily life.



Look for flaws and correct

- Include actuators
- Add medical devices
- Focus on the technology not application areas
- Include edge and cloud computing
- etc.



The Internet of Things (IoT) refers to a network of interconnected physical devices, **including sensors, actuators, and user interfaces**, that communicate and exchange data over the Internet. These devices can sense their environment, including humans, and monitor and control machines used in a wide range of applications. They are often designed to operate on low power, allowing for battery operation or energy harvesting. Data collected by IoT devices can be stored in the cloud, with **processing taking place on both edge and cloud computing units** to enhance performance, responsiveness, and privacy. This technology facilitates interaction and automation by providing real-time data and control, making it easier to implement across diverse applications.



1 Technology Definition and Communication

Technology: Internet of Things

One-paragraph definition:

The Internet of Things (IoT) refers to a network of interconnected physical devices, including sensors, actuators, and user interfaces, that communicate and exchange data over the Internet. These devices can sense their environment, including humans, and monitor and control machines used in a wide range of applications. They are often designed to operate on low power, allowing for battery operation or energy harvesting. Data collected by IoT devices can be stored in the cloud, with processing taking place on both edge and cloud computing units to enhance performance, responsiveness, and privacy. This technology facilitates interaction and automation by providing real-time data and control, making it easier to implement across diverse applications.

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Identification of technology features

identify the basic components or building blocks of the technology



understanding the functions or tasks the technology can perform



Identification of IoT technology features

Basic components

- Sensors
- Connectivity
- Data processors
- User interfaces
- Actuators

Functions or Tasks

- Data collection
- Automation
- Data analysis
- Systems integration



Technology Features: Components and Functions

Technology: Internet of Things

Basic Components & Building Blocks:

- Sensors
- Actuators
- Connectivity Modules
- **Edge Computing Units**
- Cloud Computing Units
- Data Storage Units
- User Interfaces
- Power Sources
- Security Modules



Functions & Tasks

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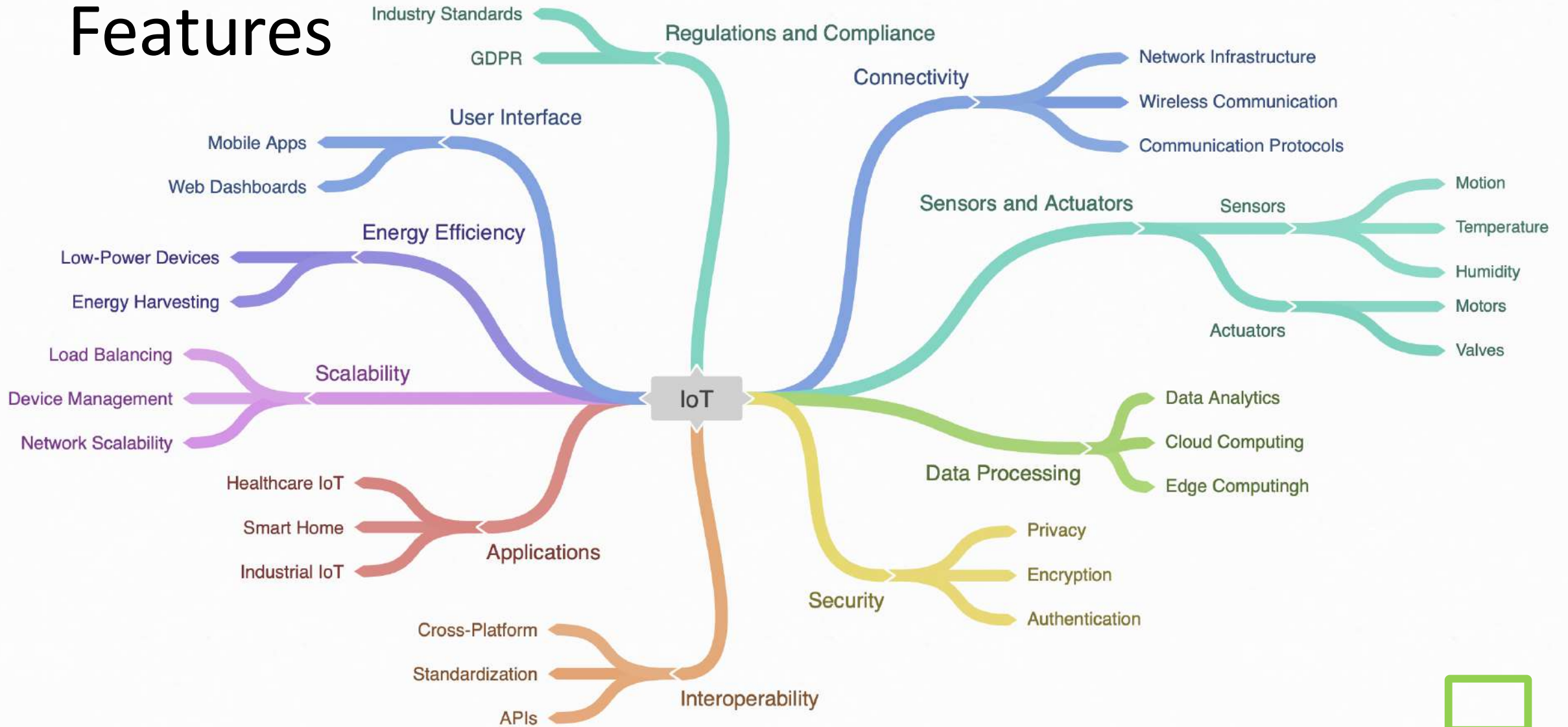


Mind Mapping

A visual thinking tool that helps individuals organize information, generate ideas, and solve problems by creating a diagram that represents concepts and their interconnections.



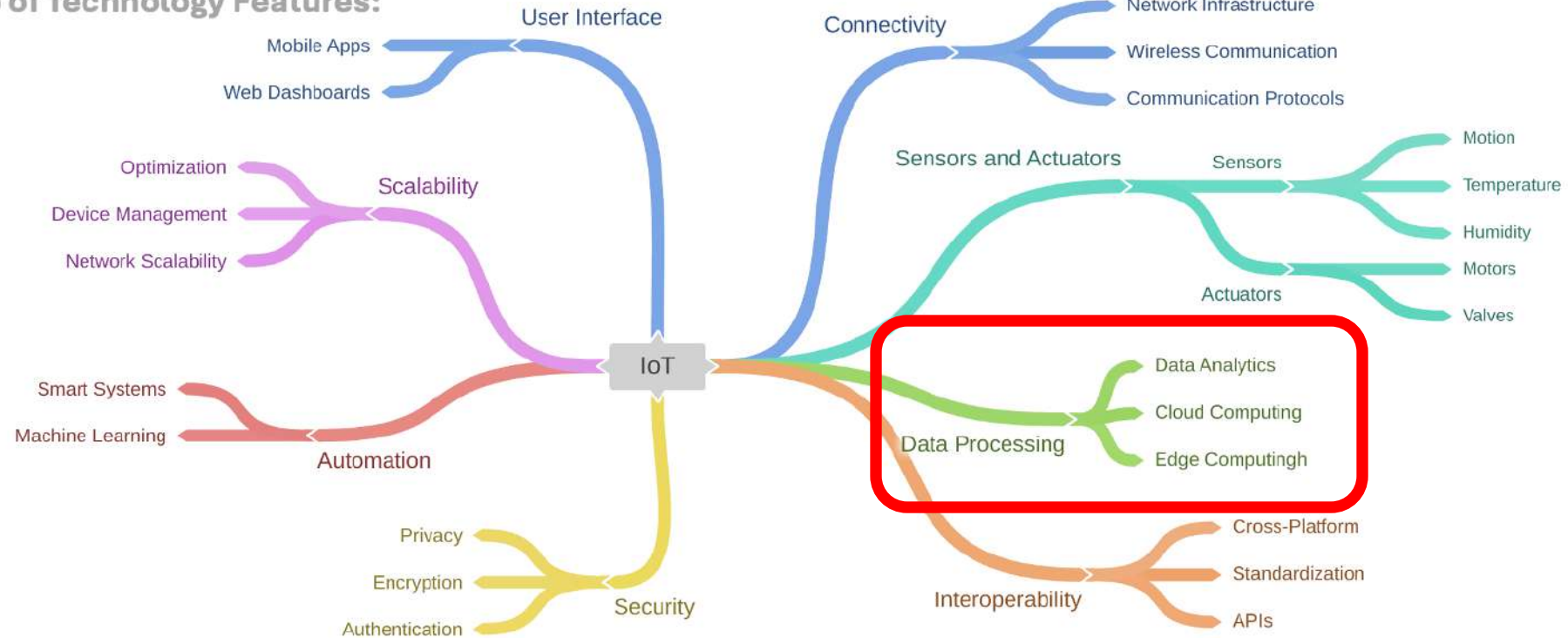
IoT Features



Technology Features: Mind Map

Technology: Internet of Things

Mind Map of Technology Features:



Prompt You are an innovator who wants to bring an innovative technology to the market. In the technology push process, before the identification of the applications of the technology, you need to understand the features of the technology. Generate a mind map to organize and visualize the features of the **Internet of Things** technology. Show the mind map. Next, generate a plain text version with tabs for indentation ready for download.



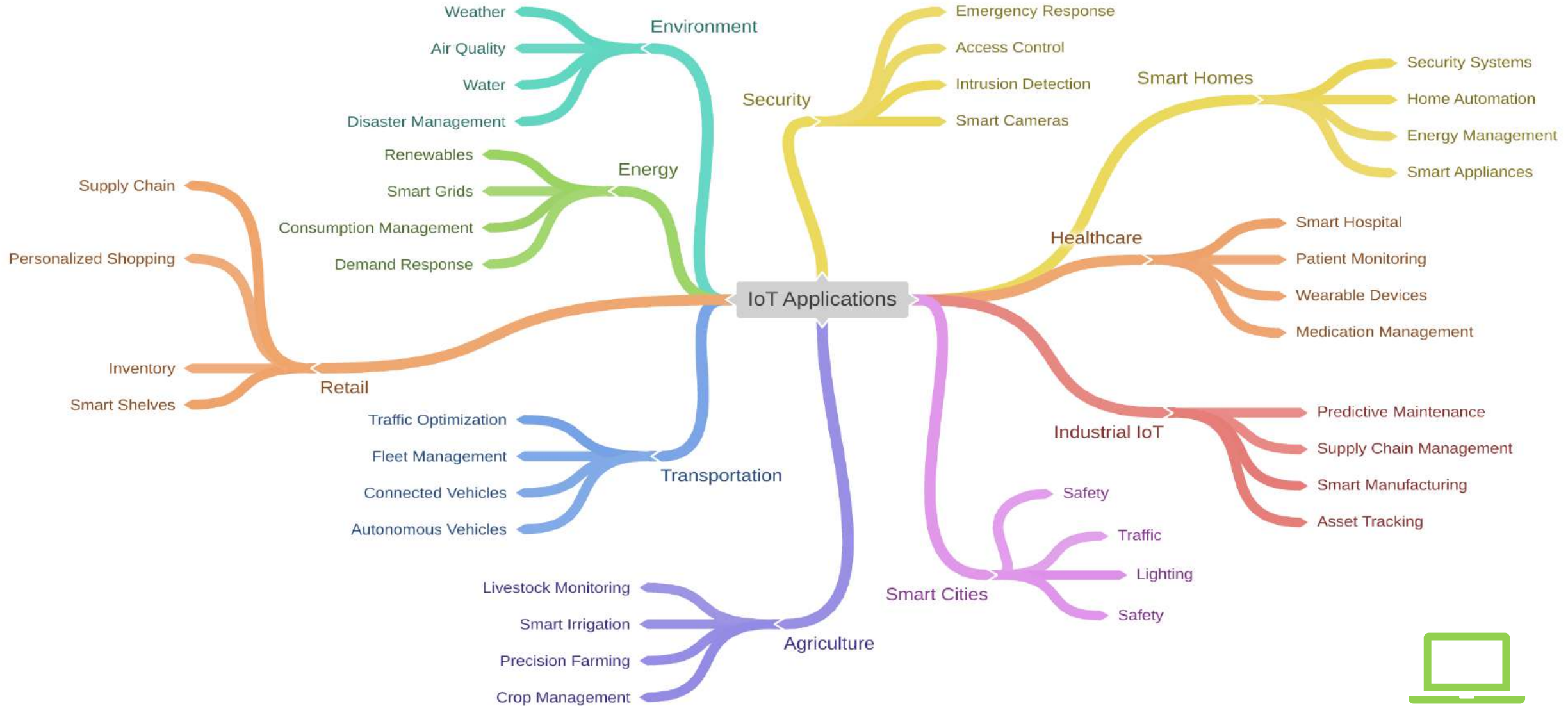
2 Identification of Application Areas

Explore and pinpoint potential application areas where the technology can provide significant value

Align technological capabilities with unmet market needs or problems.



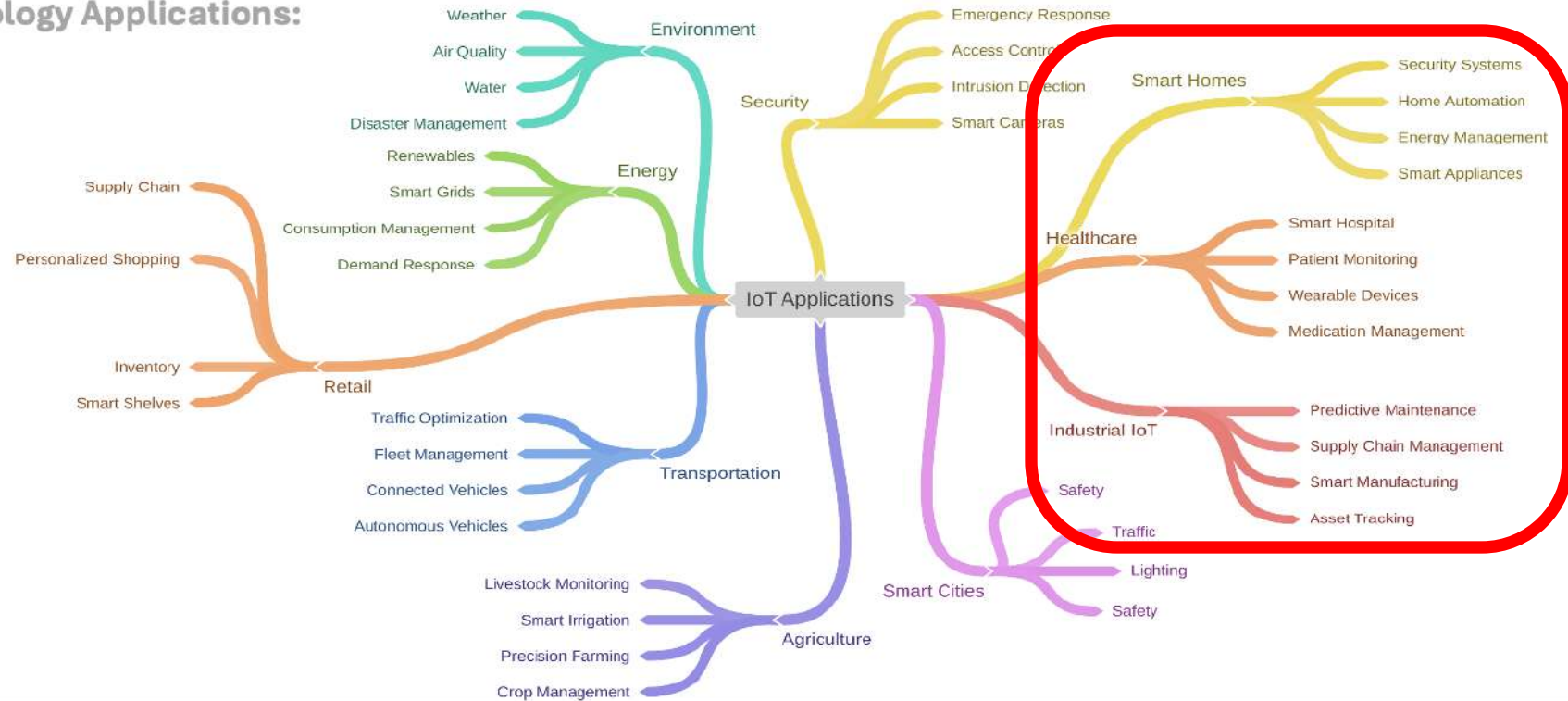
IoT Applications



Technology Applications: Mind Map

Technology: Internet of Things

Mind Map of Technology Applications:



Prompt You are an innovator who wants to bring an innovative technology to the market. In the technology push process, after the technology features identification, you need to identify the technology applications. Generate a mind map to organize and visualize the applications of the **Internet of Things** technology. Show the mind map. Next, generate a plain text version with tabs for indentation ready for download.



Decision for one opportunity

Select the most promising application area from a list of potential options



Competitive Advantage	Team Experience	Time to Market	Scalability	S
Low (0)	High (1)	High (1)	High (1)	
Low (0)	Low (0)	Low (0)	High (1)	
High (1)	High (1)	High (1)	Low (0)	

Evaluation Matrix

A table where the rows represent the options being evaluated, and the columns represent the criteria against which these options are measured



5 Decision for One Opportunity

Technology: Internet of Things

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Mapping of the customer ecosystem

Identify key stakeholders, and understand their needs and pain points



6 Identify Key Stakeholders, Needs and Pains

Technology and Application: **Internet of Things for Industrial Applications**

Stakeholder	Operations Manager	IT Manager	Maintenance Team Lead	Financial Officer	Regulatory Compliance Officer
Type	User	Influencer	User	Payer	Gatekeeper
Needs	Improve efficiency and reduce downtime through real-time monitoring and analytics.	Ensure seamless integration with existing IT infrastructure and data security.	Access to predictive maintenance tools to prevent equipment failure.	Cost-effective solutions that demonstrate clear ROI.	Solutions that comply with industry standards and regulations.
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Prompt You are a startup founder who wants to bring an innovative technology to the market. In the technology push process, after selecting the most promising technology application, you need to identify the key stakeholders, their needs, and pains. Generate a list of the five most relevant key stakeholders for the use of the **Internet of Things** technology for **industrial applications**. The list should include the **"operations manager"**. Use the five stakeholders as the head of a table. The first row classifies the stakeholder type (user, payer, influencer, gatekeeper, etc.), the second row the stakeholder's needs, and the final row the stakeholder's pains. Fill the table with reasonable content.



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Today's Guest: Paulo Marques

- MSc, PhD Computer Science
- Entrepreneur, engineer, and investor
- Co-founded Feedzai
- Feedzai CTO for 13 years
- Founding partner of TUMO Portugal
- Early-stage investor in technology companies
- Scientific Director of the CMU | Portugal program



Work for Next Class

- Watch Lesson 2 of Udacity's course on How to Build a Startup
- Use the technology push tool on the technologies for which you have a competitive advantage
- Find valuable applications for the technologies
- Identify the key stakeholders



Obrigado



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