

# Tecno Piemonte

A Case  
Study by  
Group 8



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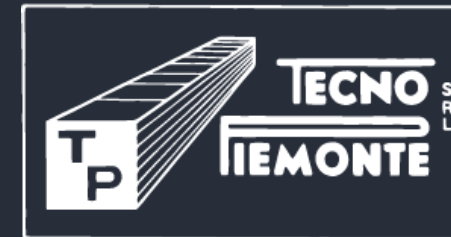


Politecnico  
di Torino



# A Brief Introduction

Tecno Piemonte from the beginning until now ...



1968

Biellese  
Flood

1

Touched by the tragic **Biellese Flood**, **Marcello Guelpa**, a student of civil engineering at the time, decided to dedicate his profession to improving the quality of **Construction Industry**.

1981 - 1985

2

## Foundation & Early Growth

**Tecno Piemonte** started as a small lab specializing in **Tests on Steel and Concrete**. But the lab quickly expanded by adding **Geotechnical Tests on Land and Rocks** and **Bituminous Conglomerate Tests**.

1986 - 2011

3

## Diversification & Accreditation

The company added services like **Geosynthetic Materials Testing** and **Environmental Testing** by launching a new Chemical Lab and was recognized as a **Notified European Body** for construction products.

2012 - 2015

4

## Expansion & More Accreditation

The company established itself as a **Personnel Certification Body**, launched a **Microbiological Lab**, provided **Educational Materials**, received **Various Certifications** as a lead entity in **Civil Engineering**.

2016 - Now

5

## Recognition & Ongoing Excellence

**Tecno Piemonte** has solidified its position as an **International Company** and continues to be a trusted partner for **Public Administrations**, **Businesses**, and **Individuals**.

**[tecnopiemonte.com](http://tecnopiemonte.com)**

# Outline

**AS-IS  
Perspective**  
Strategy and Business Model



01

02



**TO-BE  
Perspective**  
Analysis and Redesign



03



**Data Science Perspective**  
Approach, Tools, and Requirements



# AS-IS Perspective

# AS-IS Perspective: Smart Strategy Board

## Purpose Panel

- **Purpose:** To enhance safety and sustainability in the construction sector by ensuring the safety, quality, and environmental compliance of construction materials and processes.
- **Ambition:** To continue evolving as a one-stop-shop for surveys, testing, and certification, while upholding professionalism and environmental responsibility.

## Customer Panel

- **Target Market:** Entities in the construction industry, including infrastructure owners, builders, and materials manufacturers, both nationally and internationally.
- **Value Proposition:** Quality assurance, testing services, and certification services, tailored to meet specific industry needs with a focus on quality, safety, and compliance.

## Operation Panel

- **Partners:** Consortium partners, regulatory bodies, and certification organizations.
- **Core Competencies:** Advanced internal processes for testing and certification; adaptability to new regulations and technologies; development and enhancement of services in response to industry trends and customer needs.

## Resource Panel

- **People and Talent:** Highly skilled inspectors, technicians, chemists, geo-scientists, logistic personnel, and other professional, who participate in continuous training and development programs.
- **Infrastructure:** Lab facilities, warehouses, sophisticated testing machinery, and strategically located operational headquarters.
- **IT Systems and Data:** Lab management software, robust data storage and analysis systems, and strong communication networks.

## Finance Panel

- **Main Sources of Revenue and Financial Inflow:** Service fees from testing, certification, training, and consulting; public and private sector contracts; and government tenders.
- **Most Costly Actions and Financial Outflow:** Personnel wages, maintenance and upgrading of laboratory equipment, and investments in research and development.

## Competition and Risk Panel

- **Market Forces:** Competition from other companies in the industry; differentiation through specialized services, especially regarding government tenders.
- **Customer Risks:** Evolving customer expectations.
- **Operational Risks:** Possible risks in testing processes and machinery malfunctioning.
- **Financial Risks:** Economic fluctuations, market dynamics, and investment in advanced technologies..
- **Personnel Risks:** Health and safety in laboratories; retaining skilled professionals.



# AS-IS Perspective: Customer Segments in More Detail

## Materials Manufacturers

Customers in This Segment:

- Need **CE certifications**.
- Need **standardized certifications**, where the only competitive advantages are **price** and sometimes most importantly **speed**.

**Approach:** Efficient processes and scalability for **timely and cost-effective certification** services.

**Value Proposition:** The combination of Tecno Piemonte's scale, efficiency, and streamlined processes enables them to offer **certifications at a lower cost and with faster turnaround times**.

## Infrastructure Owning Entities

Customers in This Segment:

- Need **data collection** on existing infrastructure.
- Need a **wide range of tests**, for which they offer tenders, and preferably allocate them to a company that can provide **all the tests**.

**Approach:** Participation in **and leadership of consortiums** for comprehensive testing services. This approach falls under **the joint venture strategy**.

**Value Proposition:** Integrated testing solutions provided through consortium leadership, addressing a **broad range of testing needs in a cohesive manner**.

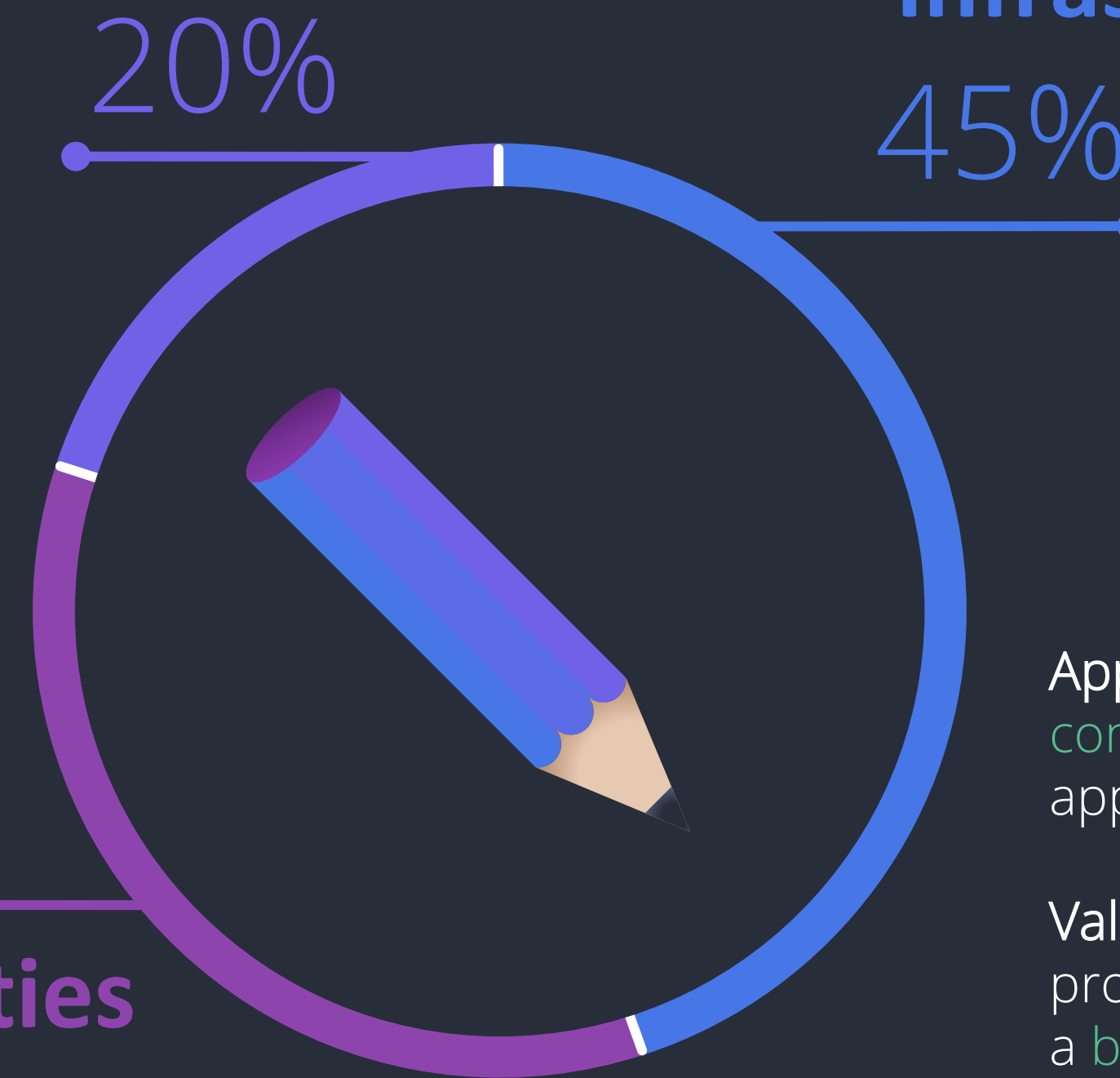
## Infrastructure Building Entities

Customers in This Segment:

- Need to conduct **mandatory tests** that are **required by law**, i.e., the scope statement.
- Need some **complementary activities** that are not official but required **to avoid lawsuits**.

**Approach:** Tecno Piemonte utilizes **specialized proprietary techniques** to address these needs, fostering innovation and adherence to regulatory standards.

**Value Proposition:** Immaculate **track record**, as well as innovative and **tailored testing services** that exceed standard requirements, ensuring both compliance and added value.



# AS-IS Perspective: Business Model Canvas

## Key Partners



- **Consortiums:** Collaborating with various companies to offer varied services, shared resources, and a collective approach to efficiently meet diverse client needs.
- **Accreditation and Certification Bodies:** Essential for maintaining compliance with industry standards and regulations.
- **Suppliers and Technology Partners:** For state-of-the-art lab equipment, machinery, and technological support.

## Key Activities



- **Testing and Certification Services**
- **Research and Development**
- **Environmental Impact Assessments**
- **Consultations and Support**

## Key Resources



- **Talents:** Skilled inspectors, technicians, and chemists.
- **Technological:** Lab management software.
- **Physical:** Labs, office spaces, and testing equipment.

## Value Propositions



- **One-Stop-Shop:** a full range of testing, certification, and consultation services, addressing all needs in the construction industry under one roof.
- **Quality, Compliance, and Innovative Solutions:** Ensuring safety and regulatory adherence; using advanced techniques for customized testing.
- **Efficiency and Speed:** Quick, reliable service delivery for clients.

## Customer Relationships



- **Proactive Monitoring:** to ensure certified entities adhere to safety standards.
- **Support:** to ensure certified entities receive the highest quality services over time.

## Channels



- **Word of Mouth**
- **Multi-Lingual Website**
- **Phone Lines and Emails**
- **Events, Conferences, and Workshops**

## Customer Segments



- **Infrastructure Owning Entities:** Seek comprehensive testing and data analysis for existing infrastructure.
- **Infrastructure Building Entities:** Require mandatory and additional testing for legal compliance and risk mitigation.
- **Materials Manufacturers:** Need efficient, timely, and cost-effective certification services.

## Cost Structure



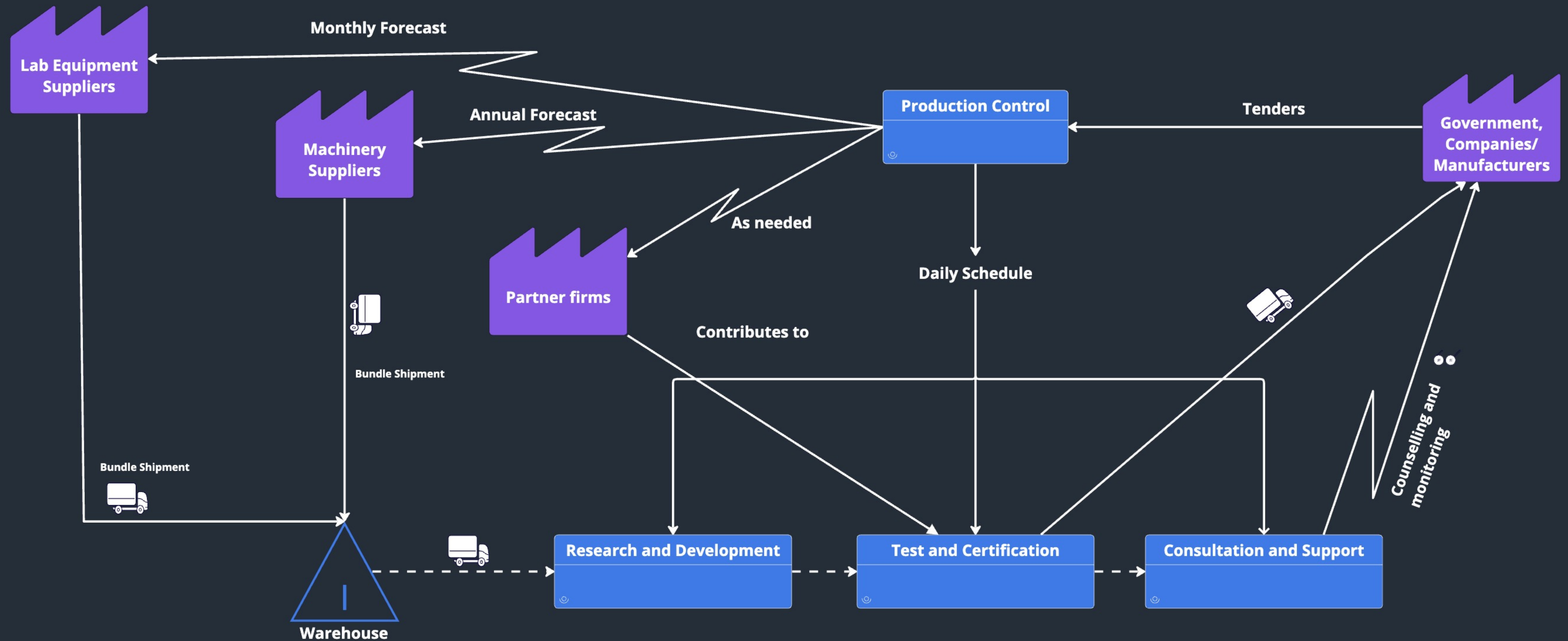
- **Fixed:** Maintenance of lab facilities, staff salaries, software licenses, and ongoing business development.
- **Semi-Fixed:** Physical infrastructure expansion and equipment upgrades.
- **Variable:** Consumables, testing materials, and supply chain logistics.

## Revenue Structure



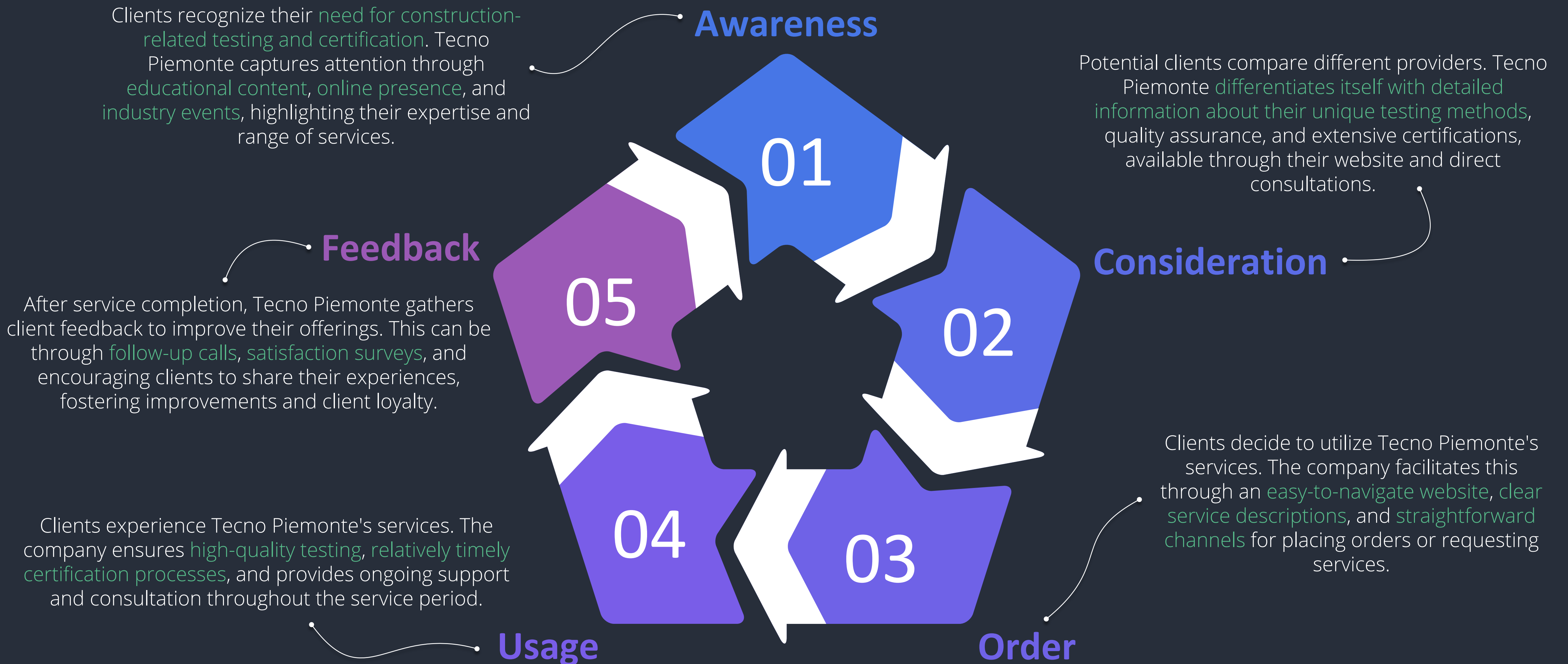
- **Service-Based Revenue:** Income from testing, certification services, and consultations.
- **Recurring Revenue:** Annual certification renewals, training course fees, and long-term contracts with consortium partners and clients.

# AS-IS Perspective: Value Stream Map





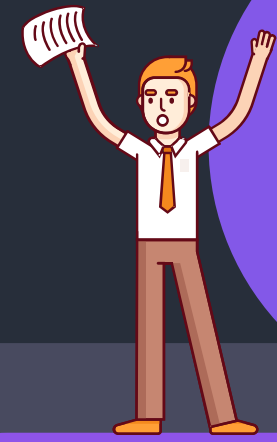
# AS-IS Perspective: Customer Journey Map



# TO-BE Perspective & Redesign



# Analysis: Data Storage



## Problem

### Inadequate Digitalization in Data Storage

Data is currently stored in a traditional manner (**Excel** sheets).

This makes it hard to **search and confront** past data.

It's also time-consuming to generate **reports and billing**.

Past proposed solutions **lacked the ability to plot charts** natively, so they kept Excel.



## Solution

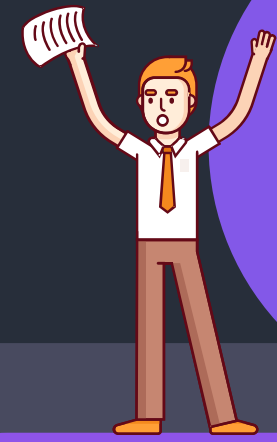
### Data Integration in a Laboratory Information Management System (LIMS)

Data is stored in an **SQL database**, which enables **programmatic data access**.

This makes it easy to **search and confront** data, as well as automatic generation of **reports and billing** information.

If integrated with appropriate visualization tools, it can also **generate charts and plots**.

# Analysis: Certification Process



Problem

Time-Consuming certification process

The main difficulties in the certification process are the **time-consuming** consultation of **technical manuals and literature** as well as ATSM standards and normative requirements.

The problem is exacerbated by the lack of knowledge in **English language** by most of the employees.



Solution

LLM assistant with Retrieval-Augmented Generation (RAG) and Machine Translation capabilities

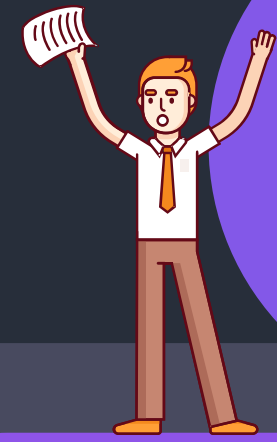
An LLM assistant with RAG can **accurately retrieve** and **summarize** manuals, literature, standards and laws at a high speed and with minimal effort.

Moreover, if equipped with **translation capabilities** it can lower the linguistic barrier.

As a bonus it can generate the code to **produce the charts** and to **search and confront** data mentioned in the previous slide, further augmenting employee **productivity**.



# Analysis: Data Collection



Problem

Inefficient and/or Traditional  
Data Collection

Data collection plays **a critical role** in the operations of Tecno Piemonte.

These operations include both **lab activities** and **construction sites**.

The current approach relies heavily on **manual methods**, involving personnel and ad-hoc processes that are proving to be **inefficient and outdated**.



Solution

Using IoT Devices for Accurate and  
Real-Time Data Collection

These **IoT devices** will be strategically placed in construction sites and the lab to continuously gather data and transmit it instantly to a central database or cloud platform.

This solution offers benefits like improved **data accuracy**, **real-time monitoring**, cost savings, and scalability, ultimately enhancing operational efficiency and **decision-making capabilities**.

# TO-BE Perspective: Smart Strategy Board

## Purpose Panel

- **Purpose:** To enhance safety and sustainability in the construction sector by ensuring the safety, quality, and environmental compliance of construction materials and processes. **[Additions] To incorporate advanced technology and innovation, which can even be key elements in safety and sustainability.**
- **Ambition:** To continue evolving as a one-stop-shop for surveys, testing, and certification, while upholding professionalism and environmental responsibility.

## Customer Panel

- **Target Market:** Entities in the construction industry, including infrastructure owners, builders, and materials manufacturers, both nationally and internationally.
- **Value Proposition:** Quality assurance, testing services, and certification services, tailored to meet specific industry needs with a focus on quality, safety, and compliance. **[Addition] AI and IoT-enhanced services for improved efficiency and real-time monitoring capabilities, enhancing safety and compliance in testing processes.**

## Operation Panel

- **Partners:** Consortium partners, regulatory bodies, and certification organizations. **[Addition] partnerships with technology providers specializing in AI and IoT solutions.**
- **Core Competencies:** Advanced internal processes for testing and certification; adaptability to new regulations and technologies; development and enhancement of services in response to industry trends and customer needs. **[Addition] Enhanced focus on AI-driven automation and IoT-based monitoring in testing and certification.**

## Resource Panel

- **People and Talent:** Highly skilled inspectors, technicians, chemists, geo-scientists, logistic personnel, and other professional, who participate in continuous training and development programs. **[Addition] experts in AI and IoT technologies.**
- **Infrastructure:** Lab facilities, warehouses, sophisticated testing machinery, and strategically located operational headquarters. **[Addition] Advanced integration of IoT devices in lab facilities and testing equipment.**
- **IT Systems and Data:** Lab management software, robust data storage and analysis systems, and strong communication networks.

## Finance Panel

- **Main Sources of Revenue and Financial Inflow:** Service fees from testing, certification, training, and consulting; public and private sector contracts; and government tenders. **[Addition] Revenue from technologically advanced testing and certification services enabled by AI and IoT.**
- **Most Costly Actions and Financial Outflow:** Personnel wages, maintenance and upgrading of laboratory equipment, and investments in research and development. **[Addition] Increased initial investment in AI, IoT, staff training for new technologies, and allocating budget for AI, machine learning, and IoT implementation to streamline processes and enhance service offerings.**

## Competition and Risk Panel

- **Market Forces:** Competition from other companies in the industry; differentiation through specialized services, especially regarding government tenders. **[Addition] differentiation through the adoption of new technologies such as AI and IoT as a competitive strategy to stay ahead in the market.**
- **Customer Risks:** Evolving customer expectations.
- **Operational Risks:** Possible risks in testing processes and machinery malfunctioning.
- **Financial Risks:** Economic fluctuations, market dynamics, and investment in advanced technologies..
- **Personnel Risks:** Health and safety in laboratories; retaining skilled professionals.
- **[Addition] Digitalization Risks:** The chance of being targeted by hackers, malware, or other technology-driven threats.



# TO-BE Perspective: Business Model Canvas

## Key Partners

- **Consortiums:** Collaborating with various companies to offer varied services, shared resources, and a collective approach to efficiently meet diverse client needs.
- **Accreditation and Certification Bodies:** Essential for maintaining compliance with industry standards and regulations.
- **Suppliers and Technology Partners:** For state-of-the-art lab equipment, machinery, and technological support.
- **[Addition] Data Science and AI Consultancies:** For expertise in implementing AI algorithms and data analysis techniques.
- **[Addition] IoT Network Providers:** Crucial for the infrastructure needed for IoT implementation.

## Key Activities

- Testing and Certification Services
- Research and Development
- Environmental Impact Assessments
- Consultations and Support
- **[Addition] Advanced Technology Integration and Service Enhancement**

## Key Resources

- **Talents:** Skilled inspectors, technicians, and chemists. **[Addition] Tech experts.**
- **Technological:** Lab management software. **[Addition] AI and machine learning tools.**
- **Physical:** Labs, office spaces, and testing equipment. **[Addition] IoT devices and infrastructure.**

## Value Propositions

- **One-Stop-Shop:** a full range of testing, certification and consultation services, addressing all needs in the construction industry under one roof. **[Addition] AI-enhanced testing and IoT monitoring, covering all construction industry needs.**
- **Quality, Compliance, and Innovative Solutions:** Ensuring safety and regulatory adherence; using advanced techniques for customized testing. **[Addition] Utilizing advanced machine learning algorithms for data analysis, offering cutting-edge testing methods.**
- **Efficiency and Speed:** Quick, reliable service delivery for clients. **[Addition] Accelerated service delivery through automation and IoT, ensuring timely and reliable results for clients.**

## Customer Relationships

- **Proactive Monitoring:** to ensure certified entities adhere to safety standards.
- **Support:** to ensure certified entities receive the highest quality services over time.

## Channels

- Word of Mouth
- Multi-Lingual Website
- Phone Lines and Emails
- Events, Conferences, and Workshops
- **[Addition] Digital Channels For Ai-driven Insights; IoT-based Data Communication Platforms**

## Customer Segments

- **Infrastructure Owning Entities:** Seek comprehensive testing and data analysis for existing infrastructure.
- **Infrastructure Building Entities:** Require mandatory and additional testing for legal compliance and risk mitigation.
- **Materials Manufacturers:** Need efficient, timely, and cost-effective certification services.

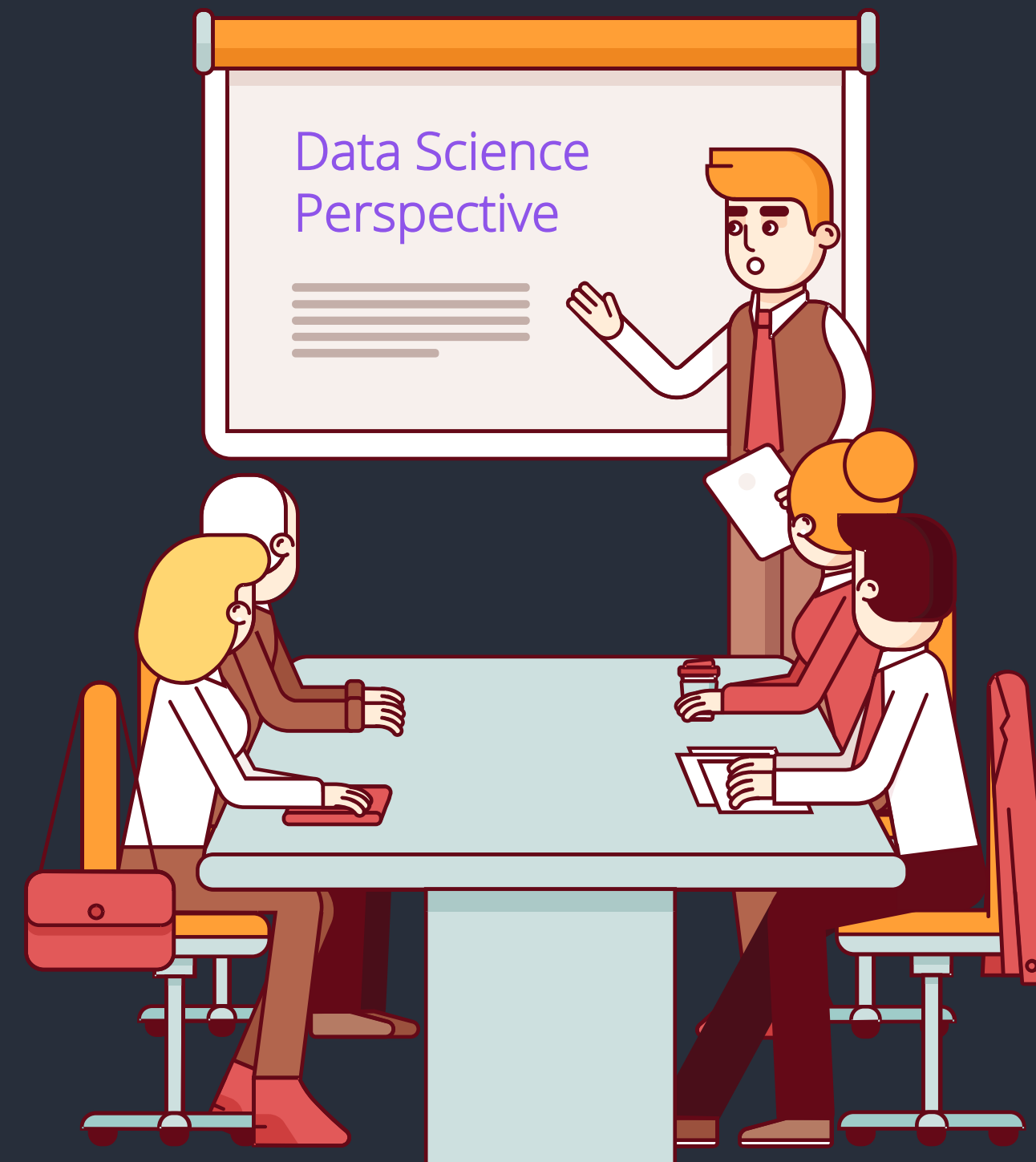
## Cost Structure

- **Fixed:** Maintenance of lab facilities, staff salaries, software licenses, and ongoing business development.
- **Semi-Fixed:** Physical infrastructure expansion and equipment upgrades.
- **Variable:** Consumables, testing materials, and supply chain logistics. **[Addition] Investment in AI and IoT technology; training costs for new digital tools.**

## Revenue Structure

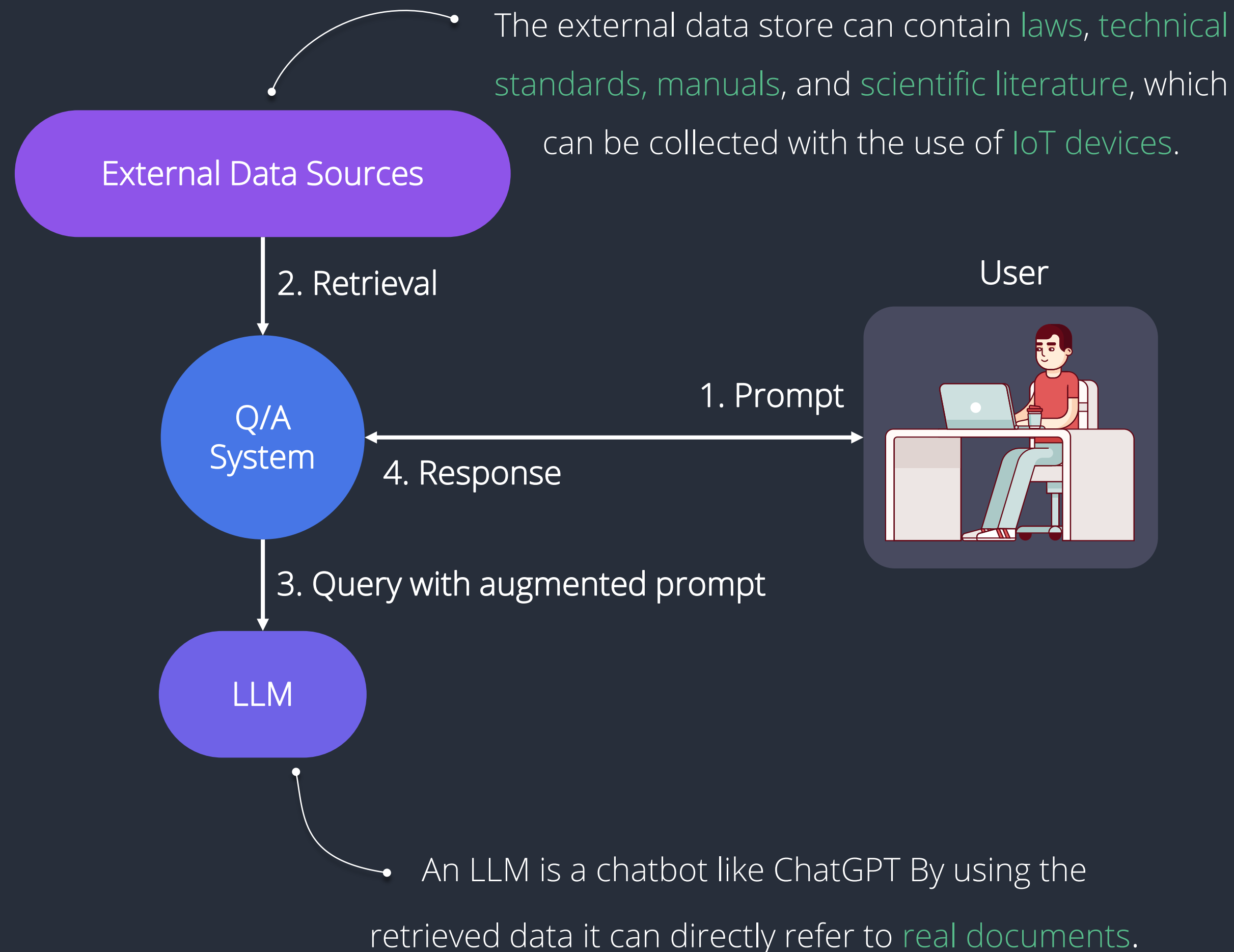
- **Service-Based Revenue:** Income from testing, certification services, and consultations. **[Addition] potential new revenue streams from innovative data-driven solutions.**
- **Recurring Revenue:** Annual certification renewals, training course fees, and long-term contracts with consortium partners and clients. **[Addition] Premium services utilizing AI and IoT capabilities.**

# Data Science Perspective

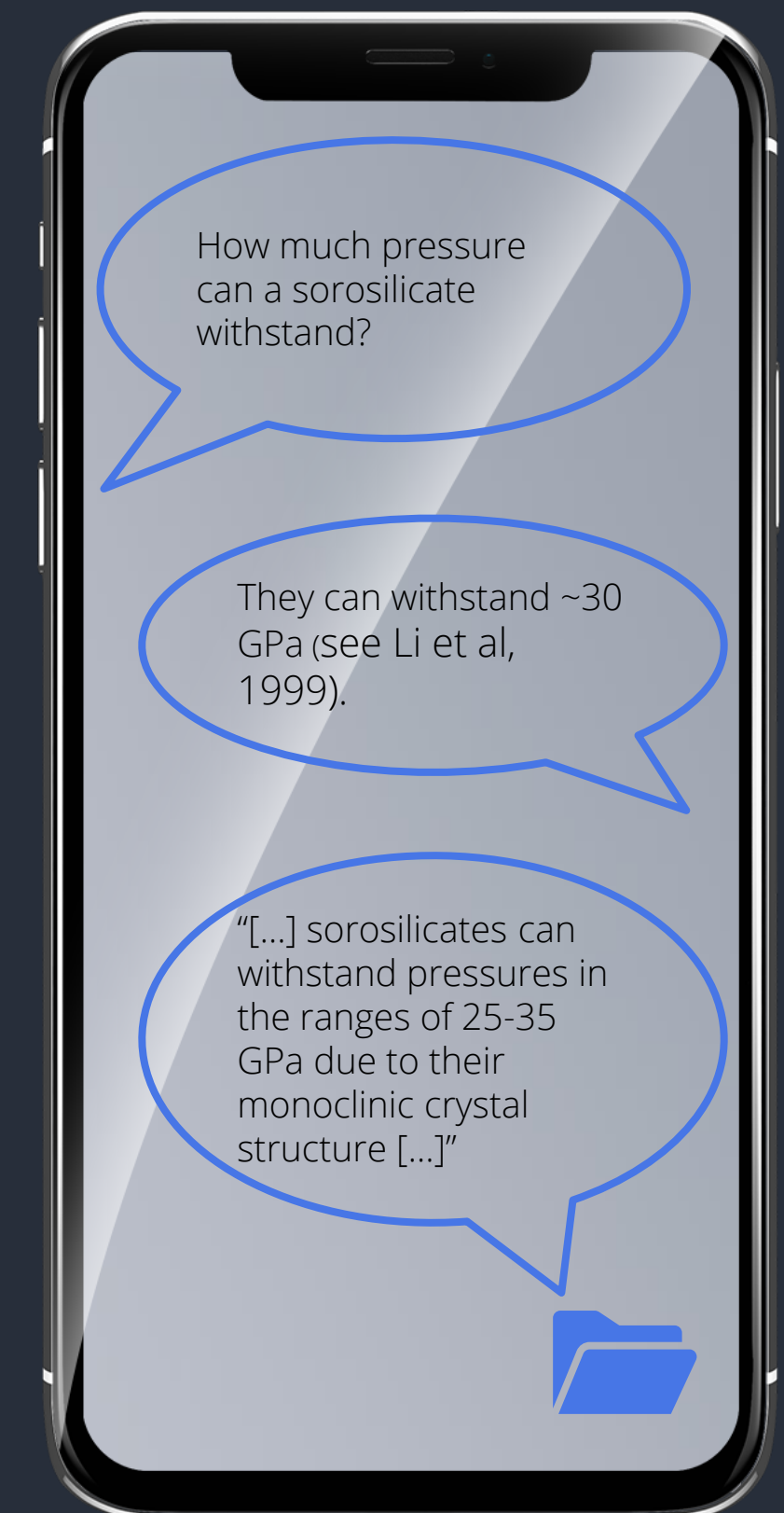




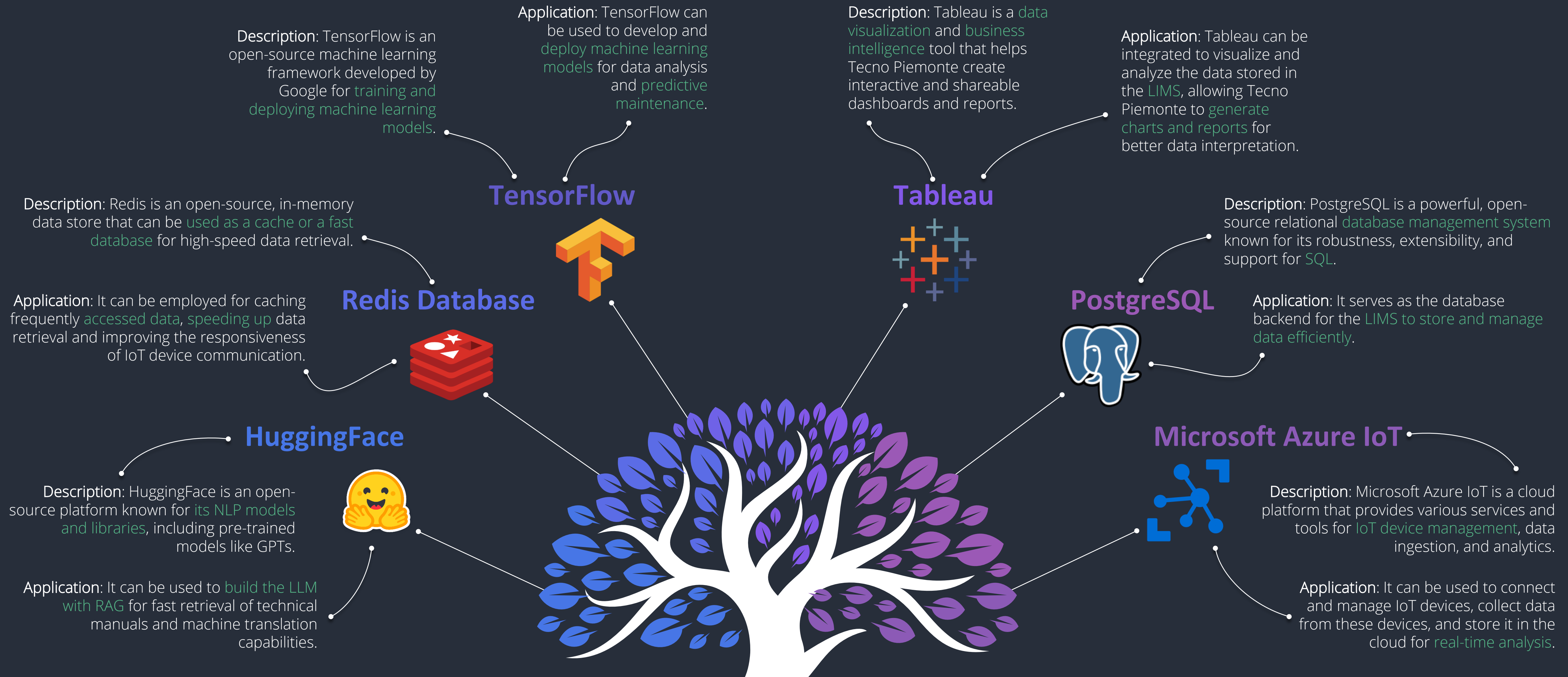
# Data Science Perspective: Approach



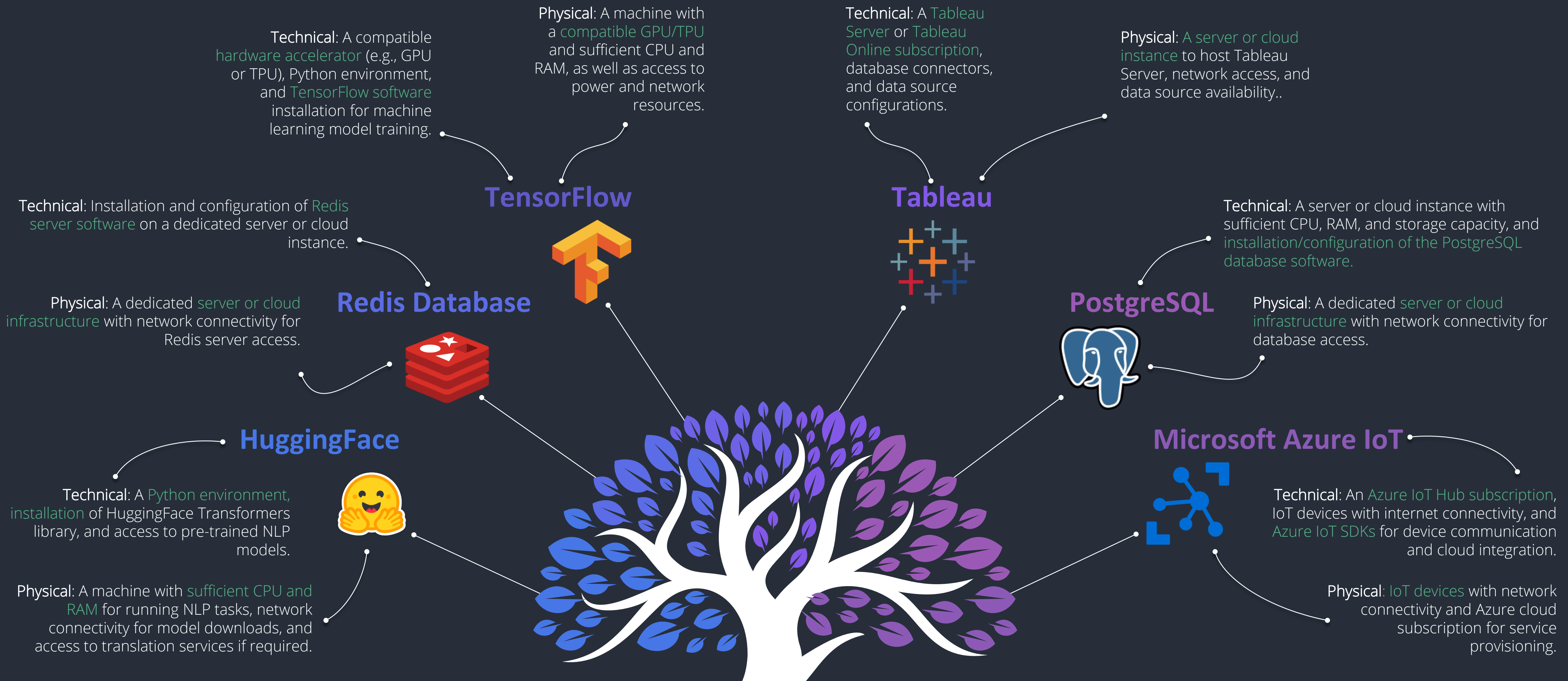
**Example**  
user asks **a question** and LLM with RAG replies



# Data Science Perspective: Tools



# Data Science Perspective: Requirements







Thank You  
For Your  
Attention



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