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With a view to obtaining a Professional Master's degree
ON «Strategic Management and System of Information»

Title of The Thesis

The Importance of Strategic Intelligence in Decision Making
Case of Study: BANK OF DEVELOPEMENT LOCAL (BDL)

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Abstract:

Strategic intelligence plays a pivotal role in informing and shaping organizational decision-making processes. However, little is known about how strategic intelligence influences decision-making within the banking sector. This qualitative case study aimed to explore the implications and role of strategic intelligence in decision-making at the Banque of Development Local (BDL).

The study opted to use qualitative methods and tools, the usage of semi-structured interviews with the head department of the Strategic and Regulatory Environmental Monitoring and the director of the Management Quality Department. Observation of Data was also collected on the targeted subjects, and the usage of analysis of documents internal and external relating to the research objective.

The results that were revealed that the strategic intelligence is heavily involved in decision making, influencing strategies, risk management and policies formation. And also the results showed that the decision makers can use the strategic intelligence as a tool and can ignore it due to multiple of reasons that can range from preference to the quality of the information.

This study contributes to our understanding of how strategic intelligence shapes decision-making in banking institutions. The findings highlight the need for robust knowledge management systems and open communication to capitalize on strategic intelligence fully

Key words: Strategic intelligence, Decision-making, Banking sector, Communication channels, Knowledge management systems.

Abstrait :

L'intelligence stratégique joue un rôle central dans l'information et l'élaboration des processus décisionnels organisationnels. Cependant, on sait peu de choses sur la manière dont l'intelligence stratégique influence la prise de décision au sein du secteur bancaire. Cette étude de cas qualitative visait à explorer les implications et le rôle de l'intelligence stratégique dans la prise de décision à la Banque de Développement Local (BDL).

L'étude a opté pour l'utilisation de méthodes et d'outils qualitatifs, le recours à des entretiens semi-directifs avec le chef du département de Surveillance Environnementale Stratégique et Réglementaire et le directeur du Département de Qualité de Gestion. L'observation des données a également été collectée sur les sujets ciblés, ainsi que le recours à l'analyse des documents internes et externes relatifs à l'objectif de recherche.

Les résultats ont révélé que l'intelligence stratégique est fortement impliquée dans la prise de décision, l'influence des stratégies, la gestion des risques et l'élaboration des politiques. Les résultats ont également montré que les décideurs peuvent utiliser l'intelligence stratégique comme un outil et l'ignorer pour de multiples raisons pouvant aller de la préférence à la qualité de l'information.

Cette étude contribue à notre compréhension de la manière dont l'intelligence stratégique façonne la prise de décision dans les institutions bancaires. Les résultats soulignent la nécessité de systèmes de gestion des connaissances robustes et d'une communication ouverte pour tirer pleinement parti de l'intelligence stratégique.

Mots clés : Intelligence stratégique, Prise de décision, Secteur bancaire, Canaux de communication, Systèmes de gestion des connaissances.

خلاصة:

يلعب الذكاء الاستراتيجي دورًا مركزيًا في إعلام وتطوير عمليات صنع القرار التنظيمي. ومع ذلك، لا يُعرف سوى القليل عن كيفية تأثير الذكاء الاستراتيجي على عملية صنع القرار داخل الصناعة المصرفية. هدفت دراسة الحالة النوعية هذه إلى استكشاف مضامين ودور الذكاء الاستراتيجي في عملية صنع القرار في مصرف التنمية المحلية.

واختارت الدراسة استخدام الأساليب والأدوات النوعية، واستخدام المقابلات شبه المنظمة مع رئيس قسم المراقبة البيئية الاستراتيجية والتنظيمية ومدير قسم الجودة الإدارية. كما تم جمع البيانات المتعلقة بالموضوعات المستهدفة، واستخدام تحليل الوثائق الداخلية والخارجية المتعلقة بهدف البحث.

وأظهرت النتائج أن الذكاء الاستراتيجي يشارك بشكل كبير في صنع القرار والتأثير على الاستراتيجيات وإدارة المخاطر وتطوير السياسات. كما أظهرت النتائج أن متخذي القرار يمكنهم استخدام الذكاء الاستراتيجي كأداة وتجاهله لأسباب متعددة تتراوح بين التفضيل وجودة المعلومات.

تساهم هذه الدراسة في فهمنا لكيفية تشكيل الإستراتيجية لعملية صنع القرار الاستخباراتي في المؤسسات المصرفية. تسلط النتائج الضوء على الحاجة إلى أنظمة قوية لإدارة المعرفة والتواصل المفتوح للاستفادة الكاملة من الذكاء الاستراتيجي.

الكلمات المفتاحية: الذكاء الاستراتيجي، اتخاذ القرار، القطاع المصرفي، قنوات الاتصال، نظم إدارة المعرفة.

Thanks:

First and foremost, all praise is due to Allah, the Lord of the worlds, and peace and blessings be upon the noblest of Prophets and Messengers. We begin by praising Allah abundantly and thanking Him for His guidance and blessings, which enabled us to complete this work.

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Introduction

1.1. Context and interest of the theme:

Strategic intelligence plays a pivotal role in aiding decision-makers to make optimal and well-informed decisions, which is considered a fundamental goal. This underscores the importance of accurate and reliable intelligence, data, and information, and how it profoundly impacts various aspects of decision-making. To obtain high-quality intelligence and information, specialized departments are dedicated to collecting data, analyzing it, and providing decision-makers with actionable insights and tailored information.

In the enterprise sector, particularly banking, strategic intelligence and decision-making can significantly influence the organization's overall strategies, policies, and culture. It presents a complex situation wherein decision-makers must assess the reliability and usability of the provided information, determine if it can be ignored, and evaluate the availability of tools that can help, change, or enhance the organization's circumstances.

The banking sector faces constant challenges due to the ever-changing legal landscape, environmental factors, and competitive offerings from rivals. To maintain relevance, gain a competitive edge, and ensure stability, banks must leverage strategic intelligence effectively.

To achieve this, banks often have dedicated departments specializing in the treatment, collection, and analysis of information, commonly referred to as strategic intelligence or environmental monitoring units.

In Algeria, most large enterprises do not fully utilize strategic intelligence departments, or if they do, they fail to realize their full potential. The banking sector stands as an exception, which is why this research was conducted in this domain due to the constant changes it faces on a daily basis. The utilization of strategic intelligence departments can highlight the organization's global strategic vision, underlining its level of understanding, maturity, and the vision it aims to achieve in the near or distant future.

Based on the significant interest surrounding strategic intelligence and decision-making, our research focuses on exploring not only the role they play but also the entire process of information collection, treatment, and communication. Additionally, we aim to understand how these factors impact the organization over time and examine the support systems available to aid decision-makers. The case study was conducted at the Banque of Development Local (BDL).

1.2. Objective of research:

Our study aims to understand the impact that the strategic intelligence on decision making, from how the quality of information effect, to usage and implication of the strategic intelligence on the sector as it whole. Also we can summaries the whole objectives in the following points:

- Examine the role and impact of strategic intelligence on decision-making in companies
- Investigate how strategic intelligence information affects the quality of decision-making
- Explore what strategic intelligence entails and its implications for organizational strategy and operations
- Analyze how strategic intelligence is utilized and integrated into company decision-making processes
- Identify challenges companies face in leveraging strategic intelligence to inform decisions

1.3. Problematic:

In an increasingly complex and shifting economic environment, where technological developments and heightened competition compel companies to continuously adapt, strategic decision-making becomes a critical challenge. Strategic choices determine an organization's ability to respond to threats or seize opportunities in the market.

However, making the right decisions requires access to relevant and up-to-date information on industry trends and competitors' moves. Strategic intelligence, the process of gathering and analyzing this information, is therefore essential.

Yet, despite the obvious benefits of strategic intelligence, many companies still struggle to truly integrate these practices into their decision-making mechanisms. Therefore, it can be asked the following questions:

What is the importance of strategic intelligence in organizational decision-making? What role does it play in anticipating threats and opportunities? And What are the challenges to optimally integrating it as a decision-making aid?

1.4. Method:

To attend our study objectives and goals, we opted to use the qualitative methodology and descriptive methodology via using semi-structured interviews across two main personals the head chef of Strategic and Regulatory Environmental Monitoring and the director of the Management Quality Department (MQD) in the level of BDL.

1.5. The importance of research:

This study contributes to understanding the profound impact and pivotal role of strategic intelligence in shaping decision-making processes within the Algerian context. By examining this relationship, the research aims to provide valuable insights and a foundation for future studies in this domain. The significance lies in shedding light on current strategic intelligence practices and their influence on Algerian enterprises' decision-making. The findings can inform organizational strategies, policymaking, and economic competitiveness.

Furthermore, the study addresses knowledge gaps surrounding the utilization of strategic intelligence in decision-making processes. It can pave the way for developing best practices and optimizing strategic intelligence implementation across sectors. Additionally, the research's contribution extends beyond Algeria, facilitating further exploration and advancements in strategic intelligence and decision-making globally.

1.6. Table of contact:

Our study is structured as the following:

we started by using introduction to highlight the objective and the interest of the theme, after that we presented and divided the research into 3 chapters which are:

the first chapter consist of two sectors the first one is the literature review, and it handles the past studies and studies related to the study research, while the second sector shows the key concepts of the strategic intelligence and decision making

The second chapter aims to describe our research methodology used as follows, and introducing the host organization in the context of which we conducted our study.

The third chapter shows the results that were obtained in the field, and follow-up with the in depth analysis of results.

Finally, we conclude our study by summarizing the main results obtained, as well as by identifying the limits of this study.

CHAPTER I

Conceptual Frame

Section 1: Literature review

Undoubtedly, the decision-making process poses a formidable challenge for the personnel entrusted with such critical responsibilities. Strategic intelligence, also known as business intelligence in certain geographical regions, exerts a profound influence on this intricate endeavor. Extensive scholarly inquiries have delved into these intricate subjects. In the subsequent section, we aim to provide a comprehensive synthesis of the concept of strategic intelligence/business intelligence and its ramifications on the decision-making process.

Furthermore, we shall present a meticulous curation of various studies and selected contributions, all of which are inextricably linked to the central themes of our esteemed research.

1.1. The Role of Strategic Intelligence Services in Corporate Decision Making:

In the following study of The Role of Strategic Intelligence Services in Corporate Decision Making writing by Laura Camilla Seitovirta, the summary is: the integration of strategic intelligence (SI) and the strategy process at XYZ Corporation. The study aims to understand how top management at XYZ makes decisions and how SI can enhance the decision-making process. The key findings are: Decision Making Process: Decision making at XYZ is done collectively, focusing on influencing agendas and selling viewpoints with relevant facts, aligning with Mintzberg's view of management styles.

Dissemination of Intelligence: The main interface to SI is the Plaza, with some criticism on the quality of reports and challenges in determining relevance. The WXYZ publication was well-received for its macro-level insights.

Recommendations: Suggestions were made to improve the screening and summarization of news by SI. Most interviewees were open to SI playing a larger role in decision making, potentially becoming a business partner for the organization.

The methodology used: The study used interview transcripts to support key findings, with quotes confirmed by interviewees for accuracy.

Descriptive quotes were selected to strengthen arguments in the empirical part of the study.

Overall, the research aims to contribute to the integration of SI and strategy work, providing insights on how SI can better support decision making processes at XYZ Corporation.

Conclusion «The Role of Strategic Intelligence Services in Corporate Decision Making" is a qualitative study that explores the role of strategic intelligence in decision making and strategy work within organizations. The study utilizes various qualitative research methods, including interviews, content analysis, participant observation, and document analysis, to gain a rich understanding of the phenomena under investigation.

The document may also include an analysis of competing or complementary models related to strategic intelligence and decision making, as well as a critique of theoretical assumptions underlying these models. By doing so, the document provides a comprehensive understanding of the complexities and challenges associated with strategic intelligence and decision making within organizations.

Overall, the document highlights the importance of strategic intelligence in decision making and strategy work, and provides insights into how organizations can improve their strategic intelligence practices to better inform decision making. The findings of the study may be useful for practitioners and researchers interested in the field of strategic intelligence and its role in organizational decision making.

1.2. Affective reactions in management teams fast strategic decision-making under extreme time pressure:

In the following study of “affective reactions in management teams fast strategic decision-making under extreme time pressure” writing by Netz, J. Svensson, M. Brundin, E and published in 2020, the study explores the role of affective reactions in management teams' fast strategic decision-making under extreme time pressure. It identifies two types of affective reactions: intensity-focused and type-focused. The findings suggest that these affective reactions play a crucial role in guiding management teams' strategic actions during the initial phase of business disruption due to unforeseen events. The implications for management teams include the need to understand and justify the display of affective reactions in making fast strategic decisions. This understanding can enhance the effectiveness of management teams in high-velocity contexts with extreme time pressure.

The main key findings are Affective reactions significantly influence management teams' strategic actions and decision-making during initial phases of unforeseen business disruptions. When time is limited, emotions prompt swift actions and cognitive shortcuts, as they are

difficult to disregard. To manage these situations, teams employ type-focused and intensity-focused affective reaction practices, utilizing management tools for fast strategic decisions. However, power dynamics within teams can impact cognitive processing. Affective reactions both hinder and facilitate crucial information exchange between management levels while making time-pressured strategic choices. This study proposes a reconceptualized view emphasizing the vital role of affective reactions in fast strategic decision-making processes. In conclusion The study emphasizes the significant influence of affective reactions on fast strategic decision-making processes, particularly in high-velocity contexts with extreme time pressure. Despite limited existing research, the findings highlight how affective reactions shape cognitive framing of tactical issues, ultimately impacting strategic outcomes. Affective reactions are not merely hindrances but also facilitate crucial information exchange between management levels during these time-pressured strategic decisions. The research proposes a reconceptualized view, emphasizing the importance of understanding the role of affective reactions and their implications for theory and practice in managing fast strategic decision-making.

1.3. Information use in strategic decision making:

In the following study of “Information use in strategic decision making” writing by Johan Frishammar and was published in the year 2003, discusses the importance of information in strategic decision making, focusing on the use of soft and hard information. Soft information includes images, visions, and cognitive structures, while hard information is quantifiable and processed numerically. The study highlights the uncertainty experienced in decision making and the need for a combination of soft and hard information for effective decision making. The research emphasizes the significance of obtaining information from both solicited and unsolicited sources and suggests that a balance between the two types of information is crucial. Additionally, the study suggests that external sources of information can aid in aligning organizations with their environment. The implications for further research include the variation in the combination of soft and hard information over time and the importance of being both structured and flexible in information search processes. The main key finding is the importance of considering a combination of soft and hard information in the decision-making process. The study emphasizes that a balanced approach to information acquisition, incorporating both qualitative insights (soft information) and quantitative data (hard

information), can lead to more informed and effective strategic decisions. By recognizing the value of integrating diverse types of information, organizations can enhance their decision-making processes and improve their strategic outcomes. In conclusion The study highlights the significance of integrating both soft and hard information in strategic decision making, emphasizing the value of a balanced approach to information acquisition for enhancing decision quality and effectiveness.

1.4. Data over intuition’ How big data analytics revolutionises the strategic decision-making processes in enterprise:

The following study of “Data over intuition’ how big data analytics revolutionises the strategic decision making processes in enterprise” writing by various authors Akter, S., Côte-Real, N., Oliveira, and others was published in May 2020, discuss the Data over intuition, delves into the influence of big data analytics on strategic decision-making processes, with IKEA as a focal point. It discusses the restructuring phase at IKEA due to a digital strategy implementation, emphasizing the importance of staying competitive and agile. The study highlights the valuable insights generated by data-driven decision-making processes for managers and strategists. Additionally, it addresses the lack of an analytical lens to investigate the effects of big data analytics on strategic decision-making and the utilization of the strategy-as-practice theory as a foundation for analysis. The main key findings are The study underscores the transformative impact of integrating big data analytics into strategic decision-making processes within organizations. It demonstrates how data-driven approaches generate valuable insights, leading to more informed and performance-oriented decisions by managers and strategists. The research contributes to the existing literature by elucidating the altered roles of practitioners, practices, and praxis in strategic decision-making due to the incorporation of data-driven methodologies. Furthermore, the restructuring phases driven by digital strategies in organizations like IKEA highlight the importance of maintaining competitiveness and agility in a dynamic business landscape. The study emphasizes the necessity for a theoretical framework to comprehend the implications of data-driven decision-making and the strategic ramifications of big data analytics. In essence, the key finding suggests that the integration of big data analytics has a profound influence on strategic decision-making processes, enabling organizations to leverage data-driven insights for more effective and competitive decision-making practices. In conclusion the analysis underscores the transformative power of big data analytics in shaping strategic decision-making practices and emphasizes the critical role of data-driven insights in enhancing organizational

performance and competitiveness. By leveraging the insights from this study, organizations can better understand the implications of big data analytics on decision-making processes and strategically position themselves for success in the era of data-driven decision-making.

Section 2: Definitions, Concepts and Typologies:

Introduction:

In This section, a comprehensive theoretical exposition encompassing the intricate concepts of strategic intelligence and decision-making processes will be elucidated.

1.1. The concept of strategic intelligence:

We will speak and mention all the concepts and definition relating to strategic intelligence.

1.1.1. The definition of strategic intelligence:

The strategic intelligence is composed between two main terms which are: **strategic and intelligence.**

Strategic is a term that has been defined in multiple ways by various scholars and practitioners across fields. While a single unanimous definition remains elusive, several seminal descriptions have achieved broad acceptance:

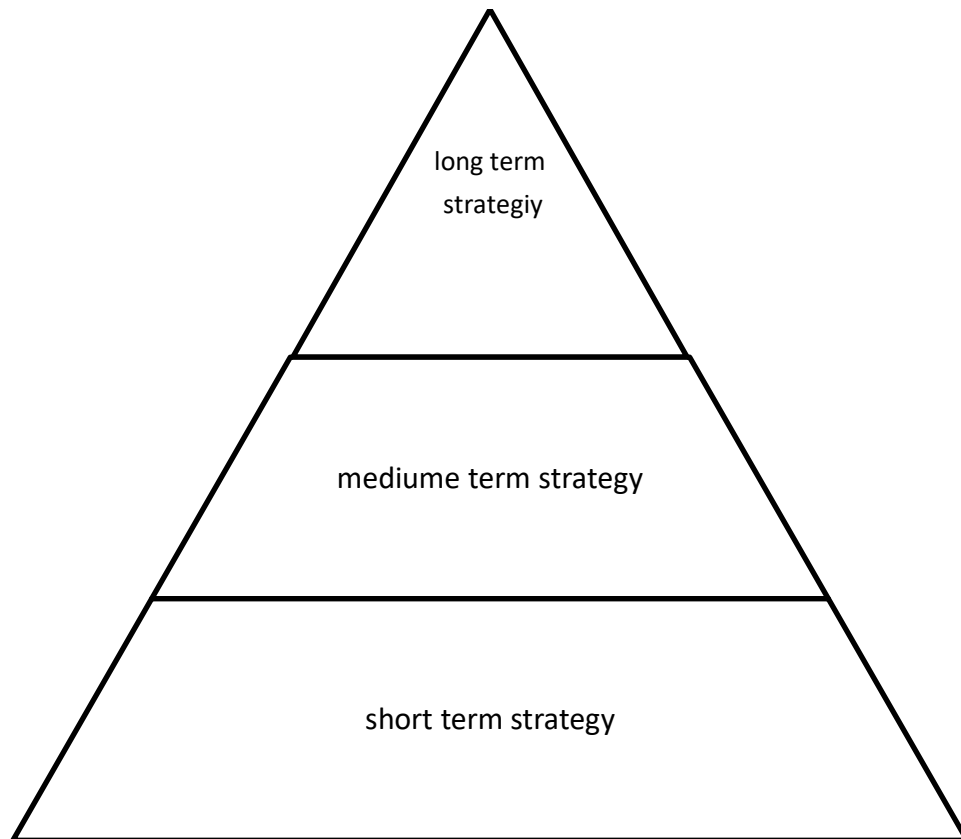
➤ Strategic refers to the formulation and execution of comprehensive, overarching plans and decision-making processes that delineate an organization's trajectory and position within its competitive milieu. It encompasses the development and implementation of strategies aimed at realizing an organization's objectives and aspirations.

➤ Chandler said that the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources for carrying out these goals (Chandler, (1962.))

➤ While David mentioned that Strategic refers to the identification of a company's long-term goals and objectives, the development of action plans to achieve those goals and objectives, and the allocation of resources necessary for carrying out these plans. (David, 2011)

Or in other definition done by (Robinson)Strategic is concerned with the future direction of the organization, and the allocation of resources in line with its goals and objectives

Figure 1 pyramid shows the terms of the strategy



Source: Established by ourselves

- **Intelligence:**

is a construct that has elicited multifaceted conceptualizations across academic disciplines and applied contexts. Myriad scholars situated in diverse domains have proffered definitions that encapsulate salient attributes of this expansive phenomenon. Nevertheless, consolidated perspectives distill certain fundamental characteristics upon which overarching agreement has coalesced. With respect to the specific realm this analysis addresses, the term intelligence denotes...

In this reformulation, I aimed to provide more technical and erudite vocabulary around communicating that intelligence is a broad concept with many definitions from different fields and experts. I preserved the meaning indicating that unified views do exist regarding key aspects of what constitutes intelligence, especially in relation to the particular area being discussed:

It has been defined that Intelligence is the ability of using knowledge, the understanding of logic and the ability to adeptly a spectrum of situation and environments:

- The definition of the fame author Howard Gardner: Intelligence is the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. (Gardner, 1983)
- Also said by the fame psychologist and author Sternberg in his book Successful

Intelligence: Intelligence is the ability to adapt to one's environment by acquiring and using knowledge in novel situations. (Sternberg, 1996)

- Writing by (Prescott, (1999)) defined it as Strategic intelligence is as “the process of developing actionable foresight regarding competitive dynamics and non-market factors that can be used to enhance competitive advantage.”

- Where ((Fleisher, (2001)) they defined it as: “Strategic intelligence consists of the capture and delivery of competitive and market intelligence to strategic decision makers and, just as important, its subsequent use by those decision makers in policymaking, planning, and operations”.

- Even though (Herring, (1999).) said that: “Strategic intelligence is the process of developing a consistent flow of intelligence that provides early warnings for strategic business decisions by looking beyond the horizon, understanding trajectories of change, and exploring peripheral vision.”

Strategic intelligence:

In simple words: the collection, analyzing, use of knowledge obtained from different sources mostly open and legal sources, for forming policies and planning for national and international level depending on the use; militarily is usually where we find the strategic intelligence but now a day we find it implemented more in the enterprises and companies to stay ahead for the competition around it, depending on their field of work or expertise.

1.1.1. The Different Levels of Intelligence:

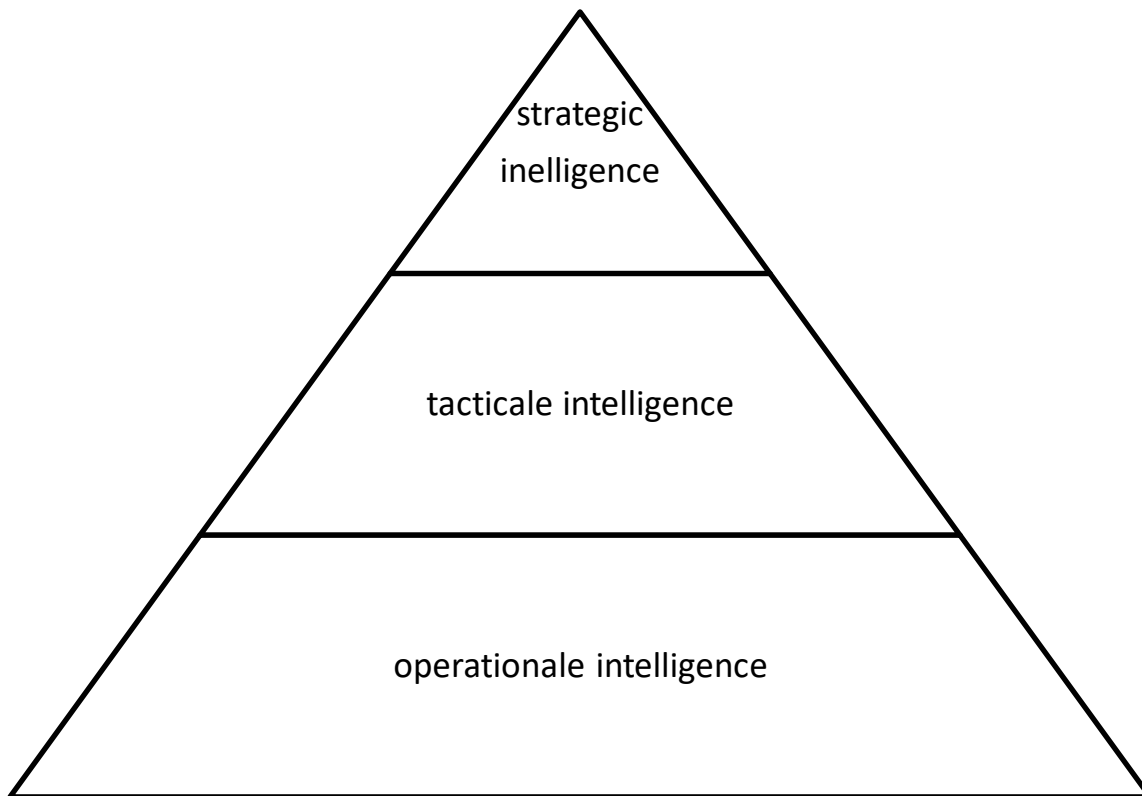
Because intelligence can serve different purposes and audiences, it has been classified into three different levels: Strategic, Tactical, and Operational. These levels have a hierarchical nature to them, with strategic intelligence situated at the top and operational intelligence at the bottom.

Strategic intelligence is forward thinking, heavily reliant upon estimations and is used to look at long-term trends. As such, it is often produced by analysts with profound subject-matter expertise and high adaptability.

Tactical intelligence provides an evaluation of a rival's current capabilities, with a focus on their strengths, weaknesses, and intentions. This type of intelligence allows an effective allocation of resources, appropriate planning, and timely engagement with the adversary.

Operational intelligence requires real time, or near real-time information to be produced, for it is used in day-to-day activities and decision making. As such, it is mostly obtained from technical sources and has a short Time to Live (TTL).

Figure 2 pyramid shows the different levels of strategies' in enterprises



source Established by ourselves taken from (Shurrab)

1.1.2The definition of decision-making:

Decision making is composed by two main key terms which are: *decision and making*

Decision:

Has been defined by multiple scholars and researchers. In relation to this thesis, the following definitions have been selected for enhancement through academic writing:

- It refers to as the act of choosing between multiple options or course of actions, It involves evaluating alternatives and selecting one or multiple paths based on criteria, constraints, preferences, and expected outcomes.
- While (Drucker, 1973)Said in his book that: “A decision is a choice made from available alternatives.”
- And the fame author Wasserman Timothy said that: «Decision making is the process

of sufficiently reducing uncertainty and doubt about alternatives to allow a reasonable choice to be made from among them". (Timothy, 1976)

The decision "making" process:

Involves validating expected outcomes and securing acceptance among key stakeholders before finalizing a choice. Ostensibly leading to one selected option, multifaceted social dynamics characterize building agreement between individuals and conferring legitimacy in organizational decisions.

Concentrating analytical lenses specifically on how groups navigate final selection provides clearer insights into political factors influencing the mobilization of collective action.

This denotes the activity of constituting, molding, or formulating a particular phenomenon. In reference to decision-making processes, it encapsulates the sequential progression of actions fundamental for coalescing diverse conceptual inputs toward a definitive output in the form of a decisive conclusion. More precisely, such a procedural pathway precipitates with an inaugural phase of delineating the salient quandary or favorable prospect. Subsequently, it progresses through integral junctures like information aggregation, option appraisal vis-à-vis preferences and objectives, analytical evaluation illuminating tradeoffs, and robust debate that synthesizes multiple perspectives. The culminating step within this calculated methodology involves selectively ratifying the optimal alternative that prevails based on rational calculations and projected outcomes - thereby extinguishing uncertainty and designating an intentional path aligned with overarching priorities. In essence, this rigorous configuration of steps constitutes the very essence of a structured decision-making architecture.

➤ While Pettigrew said that: "Making constitutes the reality of decision-making by which options are interpreted and evaluated, politics and power shape the influences considered, and organizational practices frame the context for choosing (Pettigrew, 1973)

➤ While Pfeffer mentioned that: "Making signifies the routines, interactions, bargaining and negotiations between stakeholders that prelude commitment to a course of action. (Pfeffer, 1981)

➤ In addition, Jelinek, M., & Litterer, J. A. highlighted that: Making involves the

constructions of problems, consequences, choices and rationales within prevailing cultural systems in organizations. (Jelinek, M., & Litterer, J. A., 1995)

➤ And finely "Making encompasses the collective processes through which organizations socially justify their actions and mobilize consensus for a decision." Said by (Brunsson, 2007)

Decision making:

Decision-making constitutes a meticulous methodology for evaluating quandaries, propitious prospects, or pivotal predicaments necessitating deliberation among competing trajectories. This procedure encapsulates an exhaustive appraisal of the costs, benefits, hazards, and ramifications associated with prospective alternatives, gauged in the context of predetermined institutional aspirations and stakeholder inclinations. The activity involves not solely rationale, empirical techniques, but additionally assimilates subjective discernments and intuitive judgments into the definitive conclusion. Efficacious decision-making mandates factoring the elaborate, stochastic dynamics inherent within organizations and their surrounding ecosystems. Moreover, it demands the astute mobilization of cognitive faculties and informative assets to traverse complexity while reconciling diverse vantage points. Ultimately, this thoughtful process crystallizes into a strategic commitment that demonstrates resonance with overarching priorities and objectives. The integrative approach balancing evidence and acumen is indispensable for sound decision-making under uncertainty.

1.2. Issues and objectives:

As a tool for informing organizational decision-making, strategic intelligence has associated issues and objectives even though it provides valuable insights.

This frames strategic intelligence as a tool for decision-making specifically, notes it can be helpful, but indicates it also has relevant issues and objectives. The phrasing is concise and directly sets up the Issues and Objectives discussion

1.2.1. issues of strategic intelligence:

Even if it is a great tool to help, strategic intelligence has lot of issues that can overlook its use due to the endless possibilities that can affect the use of it. The following table shows the issues that could happen and it's a small description of it

Table 1 : shows the issues of decision making:

Issue	Description
Intelligence-Decision Disconnect	Gap between intelligence production and usage, leading to a disconnect in decision-making.
Lack of Relevance	Intelligence provided may not be tailored to decision-makers' needs, hindering its effectiveness.
Overload of Data	Excessive undifferentiated intelligence production overwhelms users, making insights challenging.
Analytical Weaknesses	Intelligence analysis may suffer from biases, lack rigor, or invalid assumptions affecting reliability.
Organizational Challenges	Structural or cultural issues within organizations hinder effective intelligence utilization.
Evaluation Deficiencies	Value and ROI of intelligence may not be properly assessed, impacting effectiveness measurement.
Ethical Issues	Ethical dilemmas in intelligence collection or dissemination practices raise ethical concerns.
Timeliness Issues	Intelligence delivery delays hinder timely decision-making information availability.
Communication Gaps	Ineffective communication of intelligence findings to decision-makers leads

	to misunderstandings.
Prioritization Problems	Critical intelligence needs are not properly prioritized and addressed, impacting decision-making.
Scope Limitations	Intelligence gathering may miss key areas due to narrow focus.
Reliability Concerns	Questionable or unreliable information from intelligence sources raises reliability issues.
Confidentiality Issues	Sensitive intelligence may lack sufficient protection, posing confidentiality risks.
Cognitive Biases	Psychological biases in intelligence analysis distort the accuracy of assessments.
Resource Constraints	Lack of financial, human, or technological resources limits intelligence capabilities.
Short-term Focus	Overemphasis on immediate issues neglects long-term strategic thinking.
Lack of Objectivity	Politicization or bias in intelligence creation undermines objectivity and neutrality.
Complacency Risk	Relying on past success in intelligence does not guarantee future preparedness for new challenges.
Coordination Challenges	Collaboration issues between intelligence units, IT, data analytics, and end users hinder effectiveness.
Confirmation Bias	Intelligence may confirm pre-existing assumptions rather than challenging

	them for unbiased analysis.
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1.2.2. The objectives of strategic intelligence:

Even the previous underlined the problems or rather say the issues of strategic intelligence the use of it has a greater value then the issues that was highlighted the following table shows that the aspect and its use:

Table 2: shows the objective of strategic intelligence

Aspect	Description
Decision-maker satisfaction	Measure decision-maker perceptions of the value and usefulness of strategic intelligence outputs.
Incentives, behaviors, and priorities	Identify needed improvements in processes, behaviors, and organizational culture to increase utilization of strategic intelligence in decisions.
Structural barriers inhibiting linkage	Diagnose information flow gaps, lack of access, and other structural issues limiting the integration of strategic intelligence into decision practices.
Past major decisions assessment	Conduct after-action reviews of major decisions to evaluate whether strategic intelligence was applied appropriately and can be improved.
Intelligence competencies and best practices	Develop training, communities of practice, and protocols to embed best practices for producing actionable strategic intelligence.
Faster processes for intelligence dissemination	Streamline procedures and leverage technologies to rapidly disseminate intelligence to decision-makers.

Aspect	Description
New technologies for decision-maker access	Implement user-friendly intelligence portals, apps, dashboards and AI to enhance decision-maker access and usage.
Performance metrics and feedback loops	Establish KPIs, impact assessments, audits, and decision-maker feedback processes to continually improve value.
Cultivating a culture challenging assumptions	Promote an organizational culture that expects critical thinking and constructive dissent to enrich understanding.
Tailored intelligence products	Create customized intelligence reports, briefings, and outputs matched to specific decision needs and contexts.
Synthesizing implications for clear recommendations	Focus on deriving meaningful insights tailored to decision options and providing clear-cut recommendations.

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1.2.3. Decision-making:

is a pivotal organizational process that can profoundly influence long-term strategic outcomes. However, suboptimal decisions carry risks. Therefore, investigating the issues and aims underlying decision practices is critical for maximizing quality determinations.

1.2.3.1. The issues of decision making:

While it has its advantages the decision making goes through a lot of issues that underline the use of it, there are some of the probable issues that can affect decision making:

Cognitive biases:

Individual and group decision-making may be influenced by biases like confirmation bias, anchoring, etc.

Groupthink:

Pressure for consensus in decision-making groups can lead to a lack of critical questioning and suboptimal decisions.

Information overload:

Excessive data can overwhelm decision-makers, causing analysis paralysis and hindering effective decision-making.

Ambiguity:

Ill-defined strategic situations may lack clarity, making it challenging to reach definitive decisions.

Time pressures:

Insufficient time for deliberation can result in rushed, low-quality decisions.

Power imbalance:

Hierarchical power structures may stifle constructive debate and dissent, impacting decision quality.

Leadership challenges:

Lack of decisive, accountable, and transparent leadership can affect the quality of decisions made.

Coordination issues:

Disconnected units within organizations can undermine the effectiveness of decision-making.

Risk aversion:

Excessive conservatism and risk avoidance may lead to weak and suboptimal decisions.

Implementation issues:

Poor planning, communication gaps, or lack of stakeholder buy-in can cause decisions to falter.

1.3.2.1. The objectives of decision making:

Decision-making is a critical organizational process for achieving strategic objectives in both the short and long term. The primary objectives of effective decision-making include:

- **Achieve Organizational Goals and Objectives** The primary objective is to make decisions that help the organization achieve its strategic goals, objectives, and mission.
- **Optimize Resource Allocation.** Decisions should aim to allocate financial, human, technological and other resources effectively and efficiently.
- **Mitigate Risks** A key objective is to identify, assess and mitigate potential risks through informed decision-making.
- **Capitalize on Opportunities** Decisions should enable seizing opportunities for growth, innovation, competitive advantage etc.
- **Improve Organizational Performance** The underlying aim is to make decisions that improve key performance metrics like productivity, quality, profitability etc.
- **Enhance Adaptability and Alignment** Decisions should allow the organization to adapt proactively to changes in the external environment and internal conditions.
- **Facilitate Coordination and Commitment.** An objective is to make decisions that foster cross-functional coordination and build commitment across the organization.
- **Support Effective Execution and Change.** Decisions ultimately need to translate into effective strategy execution and successful organizational change.

1.3. Typology of strategic intelligence:

1.3.1. The typologies of strategic intelligence:

They are many typologies or use for The Strategic Intelligence, it's a tool that has many use that help companies and enterprise's which has large field of use. Some uses of this critical tool are:

- **Competitive intelligence:**

Competitive intelligence, a specific typology within the broader ambit of strategic intelligence, entails the methodical collection and evaluation of data pertaining to the competitors occupying an organization's business ecosystem. More precisely, it encompasses gathering intelligence on competitors' product portfolios, the underlying strategic considerations shaping such offerings, organizational capabilities sustaining competitive postures, as well as additional elements that constitute sources of competitive advantage for market players. By constructing an information-based perspective of the competitive landscape populated by rivals, competitive intelligence enables insight into relative positional strengths and weaknesses that can then inform strategic action aimed at solidifying the organization's place within its industry.

- **Market Intelligence:**

The assembly of insights pertaining to the broader market landscape surrounding an organization, encompassing dynamics such as trends in consumer preferences, demands that remain unsatisfied by current industry offerings, innovations reflecting shifting value chains, and other phenomena that characterize the ecosystem within which the organization is embedded. Market intelligence assists senior leadership in strategic planning.

- **Technology Intelligence:**

The attentive tracking of innovations, developmental trajectories, and trends across the technological realm that could exert influence, whether directly or indirectly, on an organization's own portfolio of products, internal processes, or the broader competitive climate it confronts. Technological intelligence represents a critical input for formulating robust technology strategy.

- **Economic Intelligence:**

The collection and examination of intelligence focused on national and international economic policies, flows related to finance and trade, regulatory shifts, and other macroeconomic factors that fundamentally shape the terrain on which an organization's industry operates and competes. Economic intelligence offers insight into forces driving industry-wide competitiveness.

- **Geopolitical Intelligence:**

The careful monitoring of political stability, public policy orientations, social discontent and activism, armed conflicts, and other political dynamics across different national jurisdictions and geographical regions which may yield meaningful impacts on business activities and enterprise strategy. Geopolitical intelligence allows anticipation of market risks related to political upheaval and governance shifts.

- **Standards Intelligence:**

It's the careful monitoring of standards created, enhanced or reviewed by publishers (ISO, ARSO, CEN, etc.) that can help improve company practices. Those responsible are tasked with monitoring the output of standards publishers and selecting standards that could be of interest to companies in their activities and respond to their needs. This will allow for optimization and adaptation.

At the same time of adaptation, a report summarizing the main changes, updates, and replacements of ISO standards is sent to the interested parties.

Table 3: typology of strategic intelligence

	The role of the intelligence in use	Example of use
Competitive intelligence	Focuses specifically on gathering data about competitors, their products, strategies, capabilities etc. Help sasses the competitive landscape.	<p>A coffee shop owner notices a new coffee chain setting up stores across the city. He talks to some new hires working there and gathers that the chain plans to open three new locations in his neighborhood.</p> <p>Armed with this piece of intelligence on a competitor's expansion strategy, the coffee shop owner decides to improve the ambiance of his stores and roll out a loyalty program to retain customers when the chain opens nearby.</p>
Market intelligence	Gathering intelligence on the overall market environment, including trends, customer preferences, unmet needs, industry innovations etc. Supports strategic planning.	A bakery monitors food trends and finds that gluten-free products are gaining wider consumer appeal and interest. This market insight can inform the bakery's product and menu strategy.
Technology intelligence	Monitoring technological innovations, developments, and trends that can impact an organization's products, processes, or competitive environment. Crucial for technology strategy.	An automaker tracks developments in electric vehicle battery technologies and charging infrastructure to understand how it may impact their existing models and future investments.
Economic intelligence	Intelligence on macroeconomic factors like economic policies, financial/trade flows, regulations etc. that shape an organization's industry and competitiveness.	A luxury retailer analyzes data about changes in high net worth consumer segments across key markets to adapt its expansion plans amidst economic shifts.

Geopolitical intelligence	Tracking political stability, government policies, social unrest, conflicts etc. across different countries and regions that can impact businesses.	An agricultural commodities trading company keeps abreast of political unrest and trade policy changes in major food exporting nations that can affect global supply and prices.
Standards intelligence	Tracking new publications, updates and replacement about the standards from their main publishers, to adapt it to their needs.	A food company can benefit from standards intelligence to follow developments in ISO 22000 (Food Safety Management Systems) and ISO 14001 (Environmental Management Systems) standards. This will allow them to update their production processes and certifications accordingly, while complying with current regulations.

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1.3.2 Typology of Decision making:

As was told decision making has also of typologies that can be use, here some typologies explication:

- **Rational vs. Intuitive:**

Rational decision-making refers to a structured and logical process that involves gathering and analyzing relevant data, considering alternatives, and selecting the optimal choice based on predetermined criteria or objectives. It is a systematic and analytical approach that aims to minimize bias and subjectivity. Intuitive decision-making, on the other hand, relies on instinct, experience, and gut feelings rather than explicit data or analysis. It is a more spontaneous and subjective process that may be influenced by emotions, personal values, and implicit knowledge.

- **Individual vs. Group:**

Individual decision-making involves a single person being responsible for gathering information, evaluating options, and making a choice. This approach allows for faster

decision-making and avoids potential conflicts or delays inherent in group settings. Group decision-making, conversely, involves multiple individuals contributing to the decision process through discussion, collaboration, and collective evaluation of alternatives. While it may be slower, group decision-making can leverage diverse perspectives and expertise, potentially leading to more comprehensive and well-rounded decisions.

- **Programmed vs. Non-programmed:**

Programmed decisions are routine, repetitive, and well-defined, with established rules, procedures, or policies to guide the decision-making process. These decisions are typically straightforward and can be automated or delegated to lower levels of management. Non-programmed decisions, on the other hand, are novel, complex, and ill-structured, with no predetermined course of action. These decisions often involve ambiguity, uncertainty, and unique circumstances that require creative problem-solving and judgment.

- **Strategic vs. Tactical/Operational:**

Strategic decisions are long-term, high-level decisions that shape the overall direction, goals, and objectives of an organization. They involve allocating resources, formulating policies, and determining competitive strategies. Tactical and operational decisions, in contrast, are shorter-term and focused on implementing strategies and managing day-to-day operations. These decisions are typically more specific, detailed, and narrower in scope compared to strategic decisions.

- **Certain vs. Uncertain:**

Certain decisions are made in environments where the information available is complete, accurate, and reliable, allowing for a clear understanding of the potential outcomes and consequences. Uncertain decisions, however, are made in situations where information is incomplete, ambiguous, or rapidly changing, making it difficult to predict outcomes with confidence. These decisions often involve risk and require contingency planning.

- **High-risk vs. Low-risk:**

High-risk decisions involve significant potential for loss, negative consequences, or unfavorable outcomes. These decisions may have far-reaching implications and require a thorough assessment of risks, careful consideration of alternatives, and robust contingency

plans. Low-risk decisions, conversely, carry minimal potential for negative consequences and are generally less critical or impactful for the organization.

- **Reversible vs. Irreversible:**

Reversible decisions are those that can be undone or modified if circumstances change or if the decision proves to be suboptimal. These decisions allow for flexibility and adjustment as new information becomes available. Irreversible decisions, on the other hand, are permanent and cannot be easily reversed or undone once implemented. These decisions often have long-lasting implications and require careful deliberation and commitment.

These definitions provide a comprehensive overview of the different types of decision-making, highlighting their distinct characteristics, contexts, and implications for organizations and decision-makers. Understanding these distinctions is crucial for tailoring decision-making processes and approaches to suit specific situations and objectives.

Table 4: typology of decision making

Typology	Description	Example
Rational vs. Intuitive	Rational - Based on facts, data, analysis Intuitive - Based on experience, judgement, instincts	Rational - Supplier choice through cost-benefit analysis Intuitive - Choosing familiar, past supplier
Individual vs. Group	Individual - Single decision maker Group - Collective decision through consensus	Individual - Personal marketing strategy decision Group - Team decision through discussions
Programmed vs. Non-programmed	Programmed - Follows organizational rules and processes Non-programmed - No predetermined methodology	Programmed - Standard customer complaint protocol Non-programmed - Responding to novel market disruption

Typology	Description	Example
Strategic vs. Tactical/Operational	Strategic - Long-term direction setting Tactical/Operational - Day-to-day operations and allocation	Strategic - International market expansion Tactical - Production schedule adjustments
Certain vs. Uncertain	Certain - Clear predictable outcomes Uncertain - Ambiguous information and unpredictability	Certain - Investment options with defined returns Uncertain - Economic uncertainty with unpredictability
High-risk vs. Low-risk	High-risk - Outcomes with major consequences Low-risk - Outcomes with minor consequences	High-risk - New product line launch Low-risk - Office furniture selection
Reversible vs. Irreversible	Reversible - Can be easily changed Irreversible - Cannot be undone, high switching costs	Reversible - Software contract termination allowed Irreversible - Infrastructure upgrade with high costs

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1.4. The deference Business intelligence (BI) between Strategic intelligence (SI):

While the main focus of this study is strategic intelligence, it's important to clarify the distinction from business intelligence due to some similarity between the two concepts. Though related, strategic intelligence and business intelligence are ultimately different domains.

A) Business intelligence (BI):

Refers to the strategies, technologies, and practices used by the organization, enterprises or companies to collect, integrate, analyze and present the internal operational data to support better decision making and performance management.

B) Strategic intelligence (SI):

Strategic intelligence refers to the process of collecting, analyzing and disseminating information from an organization's external environment in order to identify potential threats,

opportunities and trends that could impact its strategic objectives and long-term competitiveness.

The following table will show the difference between strategic intelligence and business intelligence

Table 5: underlines the difference between strategic intelligence and business intelligence

<i>Aspect</i>	<i>Strategic Intelligence (SI)</i>	<i>Business Intelligence (BI)</i>
<i>Focus</i>	External environment outside the organization	Internal operations and performance
<i>Purpose</i>	Identify opportunities, threats and trends impacting strategy and competitiveness	Analyze internal data to improve processes, decision-making and performance
<i>Information Sources</i>	External data - competitors, markets, technology, regulations etc.	Internal data from business processes and information systems
<i>Time Horizon</i>	Longer-term strategic planning and direction	Current performance tracking and tactical optimization
<i>Decision Support</i>	Strategic decision-making about objectives, positioning, resource allocation	Data-driven operational and tactical decisions for executing strategy
<i>Analytical Methods</i>	Environmental scanning, war-gaming, scenario planning	Data mining, dashboards, OLAP, reporting, visualization

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1.5. Tools and methods for collecting and analyzing information:

As told, there are a lot of methods and tools to collect and analyze information, which can affect the quality of the information itself. Therefore, we can split it into three main points: **data collection tools, data analysis tools, and data analysis methods.**

1.5.1. Data Collection Tools:

They can be defined as all the devices or methods utilized for gathering data, ranging from questionnaires and interviews to computers designed specifically for data collection. Data collection tools are critical and crucial instruments to obtain information that is accurate and correct the definition, we can distinguish between two broad categories of data collection tools:

- **Traditional Data Collection Tools:** These consist of well-established methods like interviews, questionnaires, surveys, observations, and focus groups, which have been used for a long time to collect data from individuals, groups, or populations.
- **Modern Data Collection Tools:** These involve the use of advanced technologies and specialized computer systems designed for efficient data collection, such as web analytics tools, data scraping tools, sensor networks, and data warehousing solutions, which allow for large-scale data gathering from various digital sources.

1.5.1.1. Traditional Data Collection Tools:

a) Interviews:

Interviews are a qualitative method of data collection that involves face-to-face interactions between an interviewer and one or more interviewees. The interviewer, also known as the moderator, guides the conversation by posing questions related to the topic or subject matter under investigation. An interview guide or protocol is typically used to ensure that the desired areas of inquiry are covered, although the moderator has the flexibility to probe further or deviate from the guide as necessary. The interviewees' responses are not necessarily limited to answering the specific questions asked; instead, the moderator's role is to facilitate an open dialogue and elicit rich, in-depth information from the interviewees using their interpersonal and probing skills. The success of an interview largely depends on the moderator's ability to establish a rapport, ask probing follow-up questions, and encourage detailed responses from the interviewees.

b) Questionnaires:

A questionnaire is a pivotal research instrument comprising a methodically designed series of interrogatives or prompts intended to systematically amass specific data from a targeted

cohort of respondents. It is an extensively employed and versatile technique across myriad research domains, adeptly facilitating the acquisition of both quantitative and qualitative insights into respondents' behaviors, attitudes, preferences, and cognitions. The administration of questionnaires can be self-administered or researcher-administered, encompassing an array of formats, including structured, unstructured, semi-structured, or dichotomous configurations. Rigorous questionnaire design necessitates clear and unambiguous question formulation, balanced and objective framing, consideration of respondents' perspectives, concision, specificity, and adaptability to diverse formats and audiences. Effective questionnaire development and deployment, underpinned by methodological robustness, enables researchers to elicit high-quality, reliable data that informs meaningful insights and evidence-based decision-making across multifarious domains.

c) Survey:

A survey is a systematic and methodical data collection instrument employed to solicit information, opinions, or feedback from individuals or groups through a structured set of interrogatives. It is a versatile tool widely utilized across diverse contexts, including research, marketing, public opinion analysis, and organizational assessments.

Survey administration encompasses various mediums, such as paper-based forms, online questionnaires, face-to-face interviews, or telephone interactions, visiting the interested parties to get and obtain data. The rigorous process involves meticulous questionnaire design, judicious sample selection, efficient data collection, and robust analytical techniques.

Surveys enable researchers and organizations to gain valuable insights into trends, preferences, behaviors, attitudes, and perceptions of targeted populations. When executed with methodological rigor, surveys yield high-quality, reliable data that inform evidence-based decision-making processes and contribute to strategic planning across diverse domains.

d) Observation:

Observation is a systematic method of data collection across disciplines, involving the meticulous perception, recording, and examination of phenomena, behaviors or occurrences. It enables recognizing facts, events or patterns through detailed scrutiny and measurement. Observations form the basis for making inferences, judgments and conclusions grounded in empirical evidence. They contribute to theory development, hypothesis testing, and elucidating underlying mechanisms. Observations manifest as records, descriptions or

commentaries from observational acts. The term also denotes adherence to norms, rules or laws, as well as the study of subjects through surveillance, examination or investigation to gain insights. Scientific observation is crucial for gathering evidence, validating hypotheses, and advancing knowledge through objective documentation of natural or experimental phenomena. Overall, observation is an essential technique transcending disciplines for acquiring data, refining understanding, and illuminating complexities of the world.

e) Focus Groups:

Focus groups are a qualitative research method involving 8 to 10 carefully selected participants who possess relevant knowledge or experience on a specific topic. Led by a skilled moderator, the 1 to 2-hour discussion aims to elicit in-depth responses, impressions, and opinions from participants as they share perspectives on the topic, product, or concept under investigation.

The rigorous participant selection ensures rich, nuanced insights aligned with the research objectives. Focus groups facilitate open dialogue, uncovering cognitive processes, attitudes, beliefs, and behaviors related to the subject matter. Widely used across disciplines, they enable exploratory research, hypothesis generation, and deeper understanding of target audiences.

By fostering dynamic group interactions, focus groups leverage synergistic effects to extract contextual data transcending individual interviews or surveys. The moderator guides the discourse to uncover nuanced perspectives, latent motivations, and lived experiences, enhancing the depth and breadth of qualitative insights.

1.5.1.2. Modern Data Collection Tools:

a) Web analytics tools:

Web analytics tools are sophisticated instruments employed to meticulously measure, collect, analyze, and report intricate data pertaining to website activity and user behavior patterns. These tools are indispensable for comprehending and optimizing the utilization of websites, enabling businesses and organizations to conduct in-depth studies of user interactions, traffic patterns, and performance metrics across their digital platforms, including websites, mobile sites, and applications. Web analytics tools play a pivotal role in the realms of digital marketing and website optimization by providing invaluable insights into user engagement,

conversion rates, and a myriad of other performance indicators. These tools facilitate the tracking and analysis of website traffic sources, user behaviors, conversion funnels, customer demographics, and granular user interactions, thereby empowering data-driven decision-making processes aimed at enhancing the overall online experience and driving strategic initiatives. Prominent examples of web analytics tools include industry leaders such as Google Analytics, Optimizely, Kiss metrics, Crazy Egg, AT Internet's Analytics Suite, and Microsoft Clarity. These tools offer a comprehensive suite of features, including **real-time data visualization, advanced segmentation capabilities, funnel analysis, heat maps, and robust reporting functionalities**, enabling businesses to gain deep insights into user behavior and website performance. By leveraging the power of web analytics tools, organizations can identify areas for improvement, optimize content and user flows, personalize experiences, and ultimately drive business growth through data-driven strategies aligned with user needs and preferences.

b) **Data scraping tools:**

Data scraping tools are software programs designed to extract data from various sources, such as websites, in a structured and well-organized manner. These tools enable users to collect specific and relevant data from websites, web pages, databases, or other access points, automating the process of data gathering.

Data scraping tools are widely utilized for tasks like benchmarking, market research, price monitoring, competitor analysis, and other data-driven initiatives. They offer a significant advantage by eliminating the need for manual data collection, allowing for the efficient gathering and processing of large data sets (big data).

Prominent examples of data scraping tools include Octoparse, ParseHub, Import.io, and WebHarvy. These tools typically provide features for web crawling, data extraction, data transformation, and output formatting, enabling users to acquire and structure data according to their specific requirements.

By leveraging data scraping tools, organizations can streamline their data collection processes, gain access to valuable insights, and make informed decisions based on comprehensive and up-to-date data, thereby enhancing their competitive edge and operational efficiency.

c) **Sensor networks:**

Sensor networks are interconnected systems that employ autonomous sensors to monitor and collect data from various sources and locations. The gathered data is transmitted to centralized data warehouses for storage and analysis. These networks have widespread applications, from security and environmental monitoring to tracking natural disasters.

A key component of sensor networks are Wireless Sensor Networks (WSNs), consisting of distributed wireless nodes with specialized sensors. WSNs enable real-time monitoring of physical or environmental parameters and facilitate data transmission within the designated environment.

WSNs play a crucial role in fields like the Internet of Things (IoT), remote sensing, and industrial automation by providing detailed, real-time data readings. This data enables informed decision-making, automated responses, and applications such as habitat monitoring, precision agriculture, and process control.

By utilizing sensor networks and WSNs, organizations can gain comprehensive understanding of their surroundings, detect anomalies, and respond promptly to changes, enhancing safety, efficiency, and sustainability through data-driven decision-making and automation.

d) ***Data warehousing solutions:***

Data warehousing solutions are comprehensive systems designed to collect, manage, and analyze data from various sources, enabling businesses to derive valuable insights. At the core of these solutions lies the Data Warehouse, a specialized platform engineered to store and process massive volumes of data efficiently.

Playing a pivotal role in Business Intelligence (BI), data warehousing solutions provide a centralized repository for historical and current data, empowering users to make informed decisions based on data-driven analyses. These solutions involve extracting, transforming, and loading data from diverse sources into the Data Warehouse, where it undergoes thorough cleaning, organization, and structuring for optimal analysis.

Once integrated into the Data Warehouse, users can leverage powerful visualization tools to query and extract relevant information, facilitating data-driven decision-making processes. Data warehousing solutions have evolved to meet the ever-increasing demand for sophisticated data analysis, becoming indispensable tools for organizations seeking to unlock the full potential of their data assets.

By consolidating data from disparate sources, data warehousing solutions enable businesses to gain a comprehensive, unified view of their operations, customers, and market trends. This empowers organizations to identify patterns, uncover insights, and make strategic decisions that drive growth, optimize processes, and enhance competitive advantages.

1.5.2. data analysis tools:

Data analysis tools are software applications designed to collect, process, interpret, and present data for various industries and applications. These tools play a crucial role in helping organizations, enterprises, and companies analyze and extract valuable insights from the data they collect.

Data analysis tools encompass a wide range of techniques and visualizations, including maps, charts, diagrams, and statistical models. These tools are used to explore data, identify patterns and trends, and present the information visually in a way that facilitates understanding and decision-making.

For companies aiming to be data-driven, data analysis tools are indispensable. By leveraging these tools, organizations can transform raw data into actionable insights, enabling them to make informed decisions based on the evidence provided by the data they have collected and analyzed.

Furthermore, data analysis tools are essential for businesses seeking to gain a competitive edge. By uncovering hidden trends, identifying opportunities, and optimizing processes based on data-driven insights, companies can improve their operations, enhance customer experiences, and drive innovation.

In today's data-rich environment, the ability to effectively analyze and interpret data has become a critical skill for individuals and organizations alike. Data analysis tools serve as powerful aids in this endeavor, empowering users to uncover valuable insights, make data-driven decisions, and unlock the full potential of their data assets. that there are 8 main tools that helps analysis data which are: **Statistical Analytic Tools, Data Mining and Machine Learning Tools, Business Intelligence and Data Visualization Tools and Data Management Tools, Big Data and Distributed Processing Tools.**

a. Statistical Analytic Tools:

Statistical Analytic Tools are a category of data analysis tools designed specifically for working with quantitative data. These tools are equipped with advanced statistical techniques and algorithms that enable analysts to process, analyze, and extract valuable insights from large and complex datasets.

A key strength of statistical analytic tools lies in their ability to handle and interpret extensive numerical data. They provide a wide range of analytical methods, such as regression analysis, hypothesis testing, predictive modeling, and time series analysis, allowing users to uncover patterns, trends, and relationships within the data.

in accumulation, these tools excel in data visualization, offering a variety of charts, graphs, diagrams, and other graphical representations. These visual aids are crucial for effectively communicating complex statistical information and making data more comprehensible to stakeholders.

Statistical analytic tools often incorporate features for data cleaning, transformation, and manipulation, ensuring that the data is properly prepared for analysis. They also offer robust reporting capabilities, enabling users to generate comprehensive reports and share their findings with others.

Examples of widely-used statistical analytic tools include **R, SAS, SPSS, Minitab, and Stata**. These tools are widely adopted across various industries, such as finance, healthcare, marketing, and scientific research, where quantitative data analysis is essential for making data-driven decisions and advancing knowledge.

b. Data Mining and Machine Learning Tools: This category encompasses two closely related but distinct areas: *data mining and machine learning*.

1. Data mining:

Data mining is an essential process that involves the exploration and analysis of large datasets from various sources and perspectives to uncover hidden patterns, trends, and relationships. It is a powerful tool that enables organizations to extract valuable insights and knowledge from their data, which can be leveraged to drive strategic decision-making, improve operations, reduce costs, increase revenue, and gain a competitive edge.

In its bases data mining employs advanced analytical techniques and algorithms to examine data from multiple angles, categorize it, and summarize the identified patterns and

correlations. This process involves the use of specialized data mining tools and software that can handle and process vast amounts of structured and unstructured data, ranging from transactional records to social media data, sensor data, and more.

Data mining is a fundamental component of various data-driven processes, including big data analytics, predictive modeling, and data exploitation. By uncovering hidden insights within their data assets, organizations can make informed decisions based on evidence rather than intuition or assumptions. For instance, data mining can reveal customer behavior patterns that can inform targeted marketing strategies, identify operational inefficiencies that can be optimized, or predict future trends that can guide product development and innovation efforts.

Moreover, data mining plays a crucial role in enabling organizations to leverage the full potential of their data assets. By extracting actionable intelligence from raw data, businesses can transform their data into a valuable resource, driving competitive advantage, enhancing customer experiences, and fostering data-driven innovation across various industries and domains.

It is important to note that effective data mining requires not only powerful analytical tools but also skilled analysts who can interpret the results, communicate findings effectively, and translate data-driven insights into tangible business strategies and actions.

2. Machine learning:

Machine learning is a subset of artificial intelligence (AI) that involves the development and application of algorithms and statistical models that enable computer systems to learn and improve from data without being explicitly programmed. These algorithms have the ability to identify patterns, make predictions, and adapt their behavior based on the information they are exposed to.

The fundamental of machine learning lies the concept of training algorithms on large datasets. By feeding these algorithms with vast amounts of data, they can learn and detect patterns, similarities, and relationships within the data. This learning process allows the algorithms to make accurate predictions, classifications, or decisions when presented with new, unseen data.

Machine learning algorithms can be categorized into various types, including supervised learning, unsupervised learning, and reinforcement learning. Supervised learning involves

training the algorithm with labeled data, where the correct output is known, enabling the algorithm to learn the mapping between inputs and outputs. Unsupervised learning, on the other hand, deals with unlabeled data, allowing the algorithm to discover inherent patterns and structures within the data. Reinforcement learning involves an agent learning through trial-and-error interactions with an environment, with the goal of maximizing a reward signal.

The ability of machine learning algorithms to continuously learn and improve from data makes them invaluable in a wide range of applications, such as image and speech recognition, natural language processing, predictive maintenance, recommendation systems, fraud detection, and many more. As the volume and complexity of data continue to grow, machine learning techniques become increasingly important for extracting insights, making accurate predictions, and automating decision-making processes.

It is important to note that while machine learning algorithms can learn and adapt on their own, they still require human intervention in areas such as data preparation, feature engineering, model selection, and interpretation of results. The collaboration between human expertise and machine learning algorithms is crucial for developing robust and trustworthy AI systems.

3. Business Intelligence and Data Visualization:

as told this concept collect two ideas the: **Business intelligence and data visualization**

- ***Business Intelligence:***

Business Intelligence (BI) is a systematic approach that leverages various data analysis tools, techniques, and technologies to transform raw data into actionable insights that drive informed decision-making within organizations. It encompasses a broad range of processes and activities aimed at collecting, integrating, analyzing, and presenting data in a meaningful and visually appealing manner.

In its source, business intelligence involves the utilization of specialized software and applications designed to extract, process, and consolidate data from multiple sources, both internal and external to the organization. These sources can include transactional systems,

databases, spreadsheets, and even unstructured data such as social media feeds and website logs.

Once the data is consolidated, business intelligence tools employ advanced analytical techniques, including data mining, statistical analysis, predictive modeling, and data visualization, to uncover patterns, trends, and relationships within the data. These insights are then presented through intuitive dashboards, reports, and interactive visualizations, enabling decision-makers to quickly grasp complex information and make informed, data-driven decisions.

Business intelligence plays a crucial role in supporting various aspects of an organization's operations and strategy. It can be applied to areas such as sales and marketing analysis, financial forecasting, supply chain optimization, risk management, and customer behavior analysis, among others. By providing timely and accurate insights, business intelligence empowers organizations to identify new opportunities, mitigate risks, streamline processes, and ultimately drive growth and profitability.

And can be added that, business intelligence fosters a culture of data-driven decision-making within organizations, encouraging a shift from reliance on intuition or anecdotal evidence to a more objective, fact-based approach. This systematic approach to data analysis and decision-making can lead to improved operational efficiency, enhanced customer experiences, and a competitive edge in the market.

As data continues to proliferate and become more complex, the role of business intelligence in modern organizations becomes increasingly vital. By leveraging the power of data and advanced analytical techniques, companies can gain a comprehensive understanding of their operations, customers, and market trends, enabling them to adapt quickly to changing conditions and stay ahead of the competition.

- **Data Visualization:**

Data Visualization is the practice of transforming complex datasets into intuitive and visually compelling representations, such as charts, graphs, maps, and interactive dashboards. It is a powerful tool that bridges the gap between raw data and human understanding, enabling individuals, particularly data professionals, to effectively communicate insights and tell compelling data-driven stories.

data visualization leverages the human brain's remarkable ability to process visual information quickly and efficiently. By presenting data in a graphical format, patterns, trends, outliers, and relationships become immediately apparent, facilitating rapid analysis and decision-making. This visual approach transcends the limitations of traditional data presentation methods, such as spreadsheets or tables, which can be overwhelming and difficult to comprehend, especially for non-technical audiences.

Effective data visualization goes beyond merely plotting data points; it involves careful consideration of various design principles, such as color theory, layout, and user experience. By employing visual encoding techniques, data visualization tools can map different aspects of data to visual properties like position (podiums), size, shape, and color, creating a seamless and intuitive experience for the viewer. This approach enables users to explore data interactively, drill down into specific areas of interest, and gain a deeper understanding of the underlying information.

Moreover, data visualization plays a crucial role in data storytelling, a powerful communication technique that combines data, visuals, and narrative to convey complex ideas and insights in a compelling and engaging manner. By presenting data within a contextual narrative, data visualization helps to capture the attention of audiences, foster understanding, and drive meaningful action based on the insights derived from the data.

In today's data-driven world, where organizations are inundated with vast amounts of information, data visualization has become an indispensable tool for businesses, researchers, and decision-makers across various industries. It enables them to extract valuable insights from their data, identify opportunities and risks, and make informed decisions that drive innovation, efficiency, and competitive advantage.

As data continues to grow in volume, variety, and complexity, the importance of data visualization will only increase, empowering organizations to harness the full potential of their data assets and unlock new avenues for growth and success.

4. Data Management Tools:

Data Management Tools are a comprehensive suite of software applications designed to streamline the entire data integration and transformation process, enabling organizations to harness the full potential of their data assets. These tools are built around the Extract,

Transform, and Load (ETL) framework, which facilitates the seamless integration of data from disparate sources, formats, and structures.

The Data Management Tools lies the capability to extract data from a wide range of sources, including relational databases, flat files, cloud-based repositories, and even unstructured data sources like social media feeds and web logs. This data extraction process is automated, ensuring that the latest and most relevant data is continuously ingested into the system.

Once the data is extracted, Data Management Tools leverage powerful transformation engines to cleanse, standardize, and enrich the data. These transformation processes include data validation, deduplication, data type conversions, and the application of complex business rules and calculations. By ensuring data consistency and integrity, these tools lay a solid foundation for accurate and reliable data analysis.

The final stage of the ETL process is the loading of the transformed data into target systems, such as data warehouses, data marts, or analytical databases. Data Management Tools facilitate this loading process, optimizing performance and ensuring scalability to handle even the largest and most complex datasets. Data Management Tools offer advanced features that empower businesses to manage their data lifecycles effectively. These features include scheduling and orchestration capabilities, which automate data integration processes, ensuring that data is always up-to-date and available for analysis. Additionally, these tools often provide robust data governance and lineage functionality, enabling organizations to maintain data quality, ensure compliance with regulatory requirements, and track the origins and transformations of their data assets.

By centralizing and streamlining data integration and transformation processes, Data Management Tools eliminate the need for separate ETL servers, reducing infrastructure costs and complexity. They also enable users to transform data before, during, or after loading, work with a wide range of data sources (**including RDBMS and flat files**), and ensure that appropriate drivers are installed for seamless integration with various data sources.

In today's data-driven landscape, where organizations are inundated with vast amounts of data from multiple sources, Data Management Tools have become indispensable for businesses seeking to gain a competitive edge through data-driven insights and decision-making. By empowering organizations to unlock the true value of their data assets, these tools play a

pivotal role in driving innovation, optimizing operations, and fostering data-driven cultural transformations across industries.

5. **Big Data and Distributed Processing Tools:** this concept has two main parts which are: big data and distributed processing tool.

- **BIG DATA:**

Big data has three main aspects: volume, velocity, and variety.

Volume: refers to the massive scale of data being generated and collected from various sources, such as social media platforms, internet-connected devices (IoT), transactions, and sensors. The sheer magnitude of data can be overwhelming, often measured in petabytes or even Exabyte's.

Velocity: refers to the high speed at which data is being generated, collected, and processed. Real-time data streams, such as those from social media feeds, sensor networks, or financial trading systems, require near-instantaneous processing and analysis.

Variety: refers to the diverse formats and structures of data, ranging from structured data (such as databases and spreadsheets) to unstructured data (like text documents, images, videos, and audio files). This heterogeneity in data types poses challenges for traditional data management and analysis tools.

The term "big data" is defined as the large volumes of data that cannot be effectively processed, managed, or analyzed using traditional data processing tools and methods. Traditional tools are often unable to handle the scale, speed, and complexity of big data.

In the modern technological world, driven by the proliferation of the internet, social media, and artificial intelligence (AI), big data has become increasingly prevalent and valuable. Web-based applications, online platforms, and AI systems generate and consume vast amounts of data, necessitating the use of specialized big data technologies and techniques to derive insights and extract value from this wealth of information.

The simplicity of big data lies in its fundamental definition: a large amount of data that is extensively utilized in the new technological world, such as the web and artificial intelligence. However, managing, processing, and extracting meaningful insights from this massive and diverse data require advanced tools, techniques, and infrastructure specifically designed for big data analytics.

- **Distributed Processing Tools:**

Distributed Processing Tools refer to a combination of hardware and software technologies designed to enable and facilitate distributed computing systems. These systems involve multiple interconnected computers or nodes working collaboratively to process and handle tasks in a parallel and coordinated manner, leveraging their collective computing power.

The primary goal of Distributed Processing Tools is to improve performance, scalability, and fault tolerance by dividing computational workloads across multiple machines or nodes within a network. This approach allows for efficient parallel processing, enabling faster execution of tasks and handling of large-scale data processing requirements.

In a distributed processing environment, autonomous computers communicate and exchange messages and data over a network, working together closely to achieve a common goal or task. This distributed approach offers several benefits:

1. **Improved system availability:** By distributing workloads across multiple nodes, the system becomes more resilient to failures, as individual node failures do not necessarily result in system-wide outages.
2. **Resource sharing:** Distributed Processing Tools facilitate the sharing of resources, such as computational power, storage, and specialized hardware, among nodes within the network, optimizing resource utilization.
3. **Flexibility and scalability:** These tools enable systems to be easily scaled by adding or removing nodes as needed, allowing for efficient adaptation to changing computational demands.
4. **Data and workload distribution:** Large datasets and computationally intensive tasks can be divided and distributed across multiple nodes, enabling parallel processing and reducing the overall execution time.

Distributed Processing Tools are essential in various industries and scenarios where large-scale data processing, real-time analysis, and efficient decision-making are critical. Examples include big data analytics, scientific computing, multimedia processing, and distributed databases. These tools play a vital role in facilitating seamless data integration, analysis, and decision-making processes by harnessing the power of distributed computing.

Some widely used Distributed Processing Tools include Apache Hadoop, Apache Spark, Apache Kafka, and various message queuing systems, load balancers, and distributed file

systems. These tools provide a robust infrastructure for building and managing distributed applications, enabling organizations to leverage the full potential of their computing resources and handle ever-growing data volumes and computational demands.

1.5.3. Data analysis methods:

Data analysis methods are a collection of techniques and approaches used to process, transform, and extract valuable insights from raw data. These methods leverage statistical models, mathematical algorithms, and tools to uncover patterns, relationships, and trends within datasets. The primary goal of data analysis is to convert data into actionable information that can support data-driven decision-making processes.

There is a wide range of data analysis methods, each designed to serve specific purposes and address different types of data and analytical objectives. Some commonly used methods include:

Cluster Analysis, Regression Analysis, Time Series, Analysis Data Mining, and Decision Trees

The selection of the appropriate data analysis method depends on the nature of the data, the specific objectives, and the desired outcomes. Each method has its strengths and limitations, and in many cases, a combination of multiple methods may be employed to gain a more comprehensive understanding of the data.

Data analysis methods are crucial for businesses, organizations, and researchers across various domains, including finance, healthcare, marketing, manufacturing, and scientific research. By extracting meaningful insights from data, these methods enable informed decision-making, process optimization, risk mitigation, and the development of new products, services, or strategies based on data-driven evidence.

1- Cluster Analysis:

Cluster Analysis, or clustering, is an unsupervised data analytical technique that groups similar data points or objects into clusters based on their inherent characteristics. Its primary goal is to identify homogeneous groups within a heterogeneous dataset, where data points within the same cluster are more alike than those in other clusters.

This method is widely used for applications like customer segmentation in marketing, portfolio analysis in finance, property grouping in real estate, and as a pre-processing step for machine learning algorithms. Popular clustering algorithms include K-means, hierarchical clustering, DBSCAN, and Gaussian mixture models.

Cluster analysis helps uncover hidden patterns, structures, and relationships within data, enabling exploratory data analysis and providing actionable insights for decision-making processes. It can also be used for dimensionality reduction and improving the performance of other algorithms by identifying relevant features or removing redundant information.

The choice of clustering algorithm, distance or similarity measures, and interpretation of cluster results are crucial factors to consider when employing this technique effectively.

2- Regression Analysis:

Regression Analysis is a powerful statistical technique that investigates the relationship between two or more variables by modeling the relationship between a dependent variable and one or more independent variables. It is widely used for predictive analytics, forecasting, and understanding the impact of various factors on outcomes of interest.

The primary objective of regression analysis is to develop a mathematical model that best represents the relationship between the variables, enabling predictions and informed decision-making. This is achieved by fitting a best-fit line or curve to the data, which minimizes the differences between the observed values and the predicted values.

In a regression model, the dependent variable (often referred to as the response or outcome variable) is the variable that is being predicted or explained, while the independent variables (also known as predictors or explanatory variables) are the factors that potentially influence the dependent variable.

Regression analysis offers several key benefits:

- **Predictive Modeling:**

By understanding the relationship between variables, regression models can be used to make accurate predictions of the dependent variable based on new values of the independent variables.

- **Impact Assessment:**

Regression analysis helps quantify the impact of individual independent variables on the dependent variable, allowing for the identification of the most influential factors and their relative importance.

- **Trend Analysis:**

Time-series regression models can be employed to analyze trends and patterns over time, enabling forecasting and identifying seasonal or cyclic effects.

- **Decision Support:**

By understanding the relationships between variables, businesses can make data-driven decisions, optimize processes, and develop effective strategies based on the insights gained from regression analysis.

There are various types of regression models, including linear regression (for modeling linear relationships), logistic regression (for binary or categorical outcomes), and non-linear regression (for modeling non-linear relationships). The choice of model depends on the nature of the data and the assumptions underlying the analysis.

It's important to note that while regression analysis can uncover associations between variables, it does not necessarily imply causation. Careful interpretation of the results, consideration of potential confounding factors, and domain knowledge are essential for drawing meaningful conclusions from regression analysis.

Regression analysis is widely used across various industries, including finance, marketing, economics, engineering, and scientific research, making it a valuable tool for data-driven decision-making and gaining insights from complex datasets.

3- Time Series:

Time Series Analysis is a branch of statistics focused on studying and modeling data that consists of observations recorded sequentially over time. It involves analyzing a sequence of data points, indexed chronologically at regular intervals, with the aim of understanding the underlying patterns, trends, and relationships within the data.

Time series data is ubiquitous across various domains, including finance (stock prices, economic indicators), meteorology (temperature, rainfall), engineering (sensor readings), and many others. The primary objectives of time series analysis are to:

1. **Identify Patterns:** Uncover recurring patterns, such as trends (long-term increases or decreases), seasonality (periodic fluctuations), and cyclical behavior within the data.
2. **Model Dependencies:** Capture dependencies and correlations between observations at different time points, enabling the understanding of how past values influence future values.
3. **Forecast Future Values:** Develop models that can accurately forecast or predict future values based on historical data patterns and identified relationships.

Time series analysis typically involves several key steps:

1. **Data Preprocessing:** Handling missing values, removing outliers, and ensuring stationary (constant statistical properties over time) through techniques like differencing or transformation.
2. **Exploratory Data Analysis:** Visualizing the data using line plots, histograms, and autocorrelation plots to identify patterns and trends visually.
3. **Model Selection:** Choosing an appropriate time series model, such as Autoregressive Integrated Moving Average (ARIMA), Exponential Smoothing, or more advanced techniques like Recurrent Neural Networks (RNNs) or Long Short-Term Memory (LSTM) models.
4. **Model Fitting and Evaluation:** Estimating model parameters using techniques like Maximum Likelihood Estimation (MLE) or Ordinary Least Squares (OLS), and evaluating model performance using metrics like Mean Squared Error (MSE) or Mean Absolute Percentage Error (MAPE).
5. **Forecasting:** Using the fitted model to forecast future values based on historical data patterns and identified relationships.

Time series analysis is crucial for organizations to gain insights from historical data, understand trends and patterns, and make informed decisions based on reliable forecasts. It plays a vital role in areas such as inventory management, resource allocation, risk assessment, and policy formulation.

However, it's important to note that time series analysis assumes that historical patterns will continue in the future, which may not always be the case due to unexpected events or structural changes. Therefore, continuous monitoring and updating of models are essential to ensure accurate forecasting and decision-making.

4- Analysis Data Mining:

Data Mining is an interdisciplinary field that combines elements of statistics, computer science, and machine learning to extract valuable knowledge and insights from large and complex datasets. It is a crucial component of data science and plays a vital role in enabling organizations to uncover hidden patterns, relationships, and trends within their data assets.

The data mining process involves several key steps:

1. **Data Extraction and Preparation:** This stage involves gathering data from various sources, such as databases, data warehouses, or real-time data streams. The data is then preprocessed, cleaned, and transformed into a suitable format for analysis.
2. **Data Exploration and Visualization:** Exploratory data analysis techniques, including statistical summaries and data visualization tools, are employed to gain an initial understanding of the data and identify potential patterns or outliers.
3. **Model Building:** Advanced analytical techniques, such as classification, clustering, regression, association rules, and neural networks, are applied to the data to build predictive or descriptive models. These models aim to uncover underlying relationships, patterns, and rules within the data.
4. **Model Evaluation and Deployment:** The developed models are rigorously evaluated using appropriate metrics and techniques to ensure their accuracy, reliability, and generalizability. Once validated, the models can be deployed into production systems for real-time decision-making or predictive analytics.

Result Interpretation and Visualization: The extracted knowledge and insights are presented in a comprehensible format, often through visualizations, reports, or dashboards, to facilitate decision-making and strategic planning.

Data mining is essential for businesses across various industries, including finance, marketing, healthcare, manufacturing, and e-commerce. By leveraging data mining techniques, organizations Can:

- Identify customer behavior patterns and preferences, enabling targeted marketing campaigns and personalized product recommendations.

- Detect fraudulent activities and anomalies in financial transactions or cybersecurity threats.
- Optimize manufacturing processes by identifying bottlenecks, quality issues, or inefficiencies.
- Predict future trends and market dynamics, supporting strategic decision-making and risk management.
- Uncover hidden relationships and correlations within large datasets, leading to new scientific discoveries or operational improvements.

As data volumes continue to grow exponentially, data mining has become increasingly important for organizations to gain a competitive edge by extracting actionable insights from their data assets. However, it is crucial to ensure data privacy, security, and ethical considerations are addressed when implementing data mining practices.

5. *Decision Trees*:

Decision Trees are powerful machine learning models that use a tree-like structure to represent a series of decisions and their potential consequences or outcomes. They are widely used for both classification and regression tasks, providing a visual and interpretable way to model complex decision-making processes.

The fundamental structure of a *decision tree* consists of the following components.

1. **Root Node:** The topmost node in the tree, representing the entire dataset or population.
2. **Internal Nodes:** These nodes represent attributes or features of the data, based on which the tree splits into branches.
3. **Branches:** The outgoing segments from a node, representing the possible values or outcomes of the tested attribute.
4. **Leaf Nodes:** The terminal nodes in the tree structure, representing the final decisions or predicted outcomes.

The construction of a decision tree follows a recursive, divide-and-conquer approach. Starting from the root node, the algorithm selects the most informative feature or attributes to split the data into subsets or branches. This process continues recursively for each subset, creating new internal nodes and branches until homogeneous subsets are achieved, leading to the formation of leaf nodes.

Decision trees offer **several key advantages**:

- **Interpretability:** The tree-like structure makes decision trees highly interpretable, allowing users to easily understand the decision-making process and the importance of each feature.
- **Handling Mixed Data Types:** Decision trees can accommodate both numerical and categorical data, making them versatile for various types of datasets.
- **Non-linear Relationships:** Unlike linear models, decision trees can capture non-linear relationships between features and the target variable.
- **Feature Selection:** The tree-building process implicitly performs feature selection, highlighting the most relevant attributes for decision-making.

To prevent over fitting and improve generalization, decision trees often undergo pruning, a process that removes branches or sub trees that do not significantly contribute to the model's predictive power. Techniques like cross-validation and ensemble methods (e.g., Random Forests, Gradient Boosting) can further enhance the performance and robustness of decision tree models.

Decision trees find applications in various domains, including finance (credit risk assessment, fraud detection), healthcare (diagnosis and treatment planning), marketing (customer segmentation, targeted advertising), and operations research (resource allocation, supply chain optimization). Their visual representation and ease of interpretation make them valuable tools for decision support systems and explainable AI.

However, it is important to note that decision trees can be sensitive to imbalanced datasets and may exhibit instability when small changes occur in the training data. Careful data preprocessing, feature engineering, and model evaluation are crucial to ensure the reliability and accuracy of decision tree models.

2.The decision-making process in organizations:

In this part we will speak all about the decision making process in organization, from key aspects to the importance.

2.1. The importance of decision making:

Decision-making is a fundamental skill that profoundly impacts personal, professional, and organizational outcomes. Its significance lies in:

1. **Shaping Outcomes:** Decisions have far-reaching consequences, affecting individuals, teams, and organizations. Effective decision-making is crucial for achieving desired results.
2. **Reflecting Values:** Decisions are a reflection of one's principles, beliefs, and ethical standards. They showcase what individuals and organizations truly stand for.
3. **Demonstrating Leadership:** Making decisions, especially in challenging situations, demonstrates a willingness to lead, take responsibility, and drive progress toward goals.
4. **Setting Examples:** Leaders' decisions set the tone and serve as examples for others to follow, influencing behaviors and actions within the organization.

5. **Considering Human Impact:** Thoughtful decision-making involves understanding and prioritizing the human cost and well-being of those affected by the decisions.
6. **Strategic Thinking:** Effective decision-making requires strategic and conceptual thinking, focusing on what is truly important and impactful rather than just problem-solving.
7. **Driving Progress:** Timely and well-informed decisions are essential for organizations to adapt, seize opportunities, and stay competitive in dynamic environments.

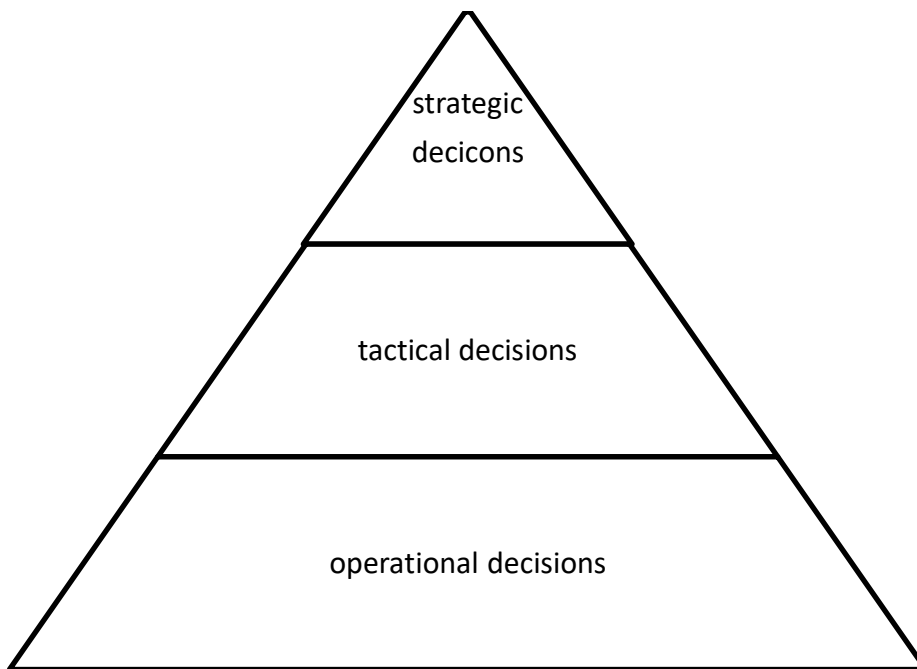
Ultimately, decision-making is a critical skill that shapes the trajectory of individuals, teams, and organizations. It demands careful consideration of factors, values, and consequences, while also demonstrating the courage and responsibility to take purposeful action.

it was mentioned from multiple authors that decision making is more complex than it seems, while Daniel Kahneman in his book "Thinking, Fast and Slow" spoke on existence of two systems of thinking that shapes the judgment and decision of the decision maker. (Kahneman, "Thinking, Fast and Slow, 2011). Then the fame chess player Garry Kasparov mentioned on his book Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins" spoke about the effect of the AI and how it can ruin the creativity of the decision maker yet also spoke about humans possess the ability to think abstractly, exercise judgment, and make strategic decisions that involve ethical considerations and long-term implications. (Kasparov, 2017)

2.1.1. Types of decision making:

in decision making there are 3 main types of decision which are: **operational decision making, tactical decision making and strategic decision making**

Figure 3: pyramid shows type of strategies in decision making



source Established by ourselves taken from (Levina)

I- Operational Decision-Making:

Operational decisions are the backbone of an organization's daily operations, ensuring smooth and efficient functioning. These decisions are short-term, routine, and often repetitive, focusing on the execution of specific tasks and processes. Operational decision-making occurs at the lower levels of management and is driven by factual information, established procedures, and clearly defined objectives.

The primary goal of operational decision-making is to optimize resource utilization, minimize costs, and maintain or improve productivity and quality standards. These decisions are typically made within the constraints of existing policies, budgets, and operational guidelines, leaving little room for strategic considerations or significant deviations.

Examples of operational decisions include:

1. Scheduling employee shifts and managing workloads
2. Ordering and managing inventory levels
3. Implementing quality control measures and addressing production issues

4. Coordinating logistics and transportation activities

II- Tactical Decision-Making:

Tactical decision-making serves as a bridge between operational and strategic decision-making processes. It involves the coordination and alignment of operational activities to achieve the organization's short to medium-term goals, typically spanning six months to a year. Tactical decisions are made at middle management levels and are guided by the overarching strategic objectives set by top leadership.

The primary focus of tactical decision-making is to mobilize resources, execute action plans, monitor progress, and make adjustments as needed to ensure the organization remains on track to meet its short-term targets. Tactical management encompasses activities such as resource allocation, performance monitoring, process optimization, and risk mitigation.

Examples of tactical decisions include:

1. Developing and implementing marketing campaigns to support strategic objectives
2. Optimizing supply chain operations for cost-effectiveness and efficiency
3. Implementing process improvements or adopting new technologies to enhance productivity
4. Adjusting product offerings or pricing strategies to respond to market dynamics

III- Strategic Decision-Making:

Strategic decision-making is the cornerstone of an organization's long-term success and growth. These decisions are made at the highest levels of management and have far-reaching implications for the entire enterprise. Strategic decisions shape the organization's mission, vision, and overarching goals, and define the strategies and broad courses of action necessary to achieve those objectives.

Strategic decision-making is a complex and unstructured process that requires business acumen, critical thinking, and a comprehensive understanding of the organization's internal capabilities, as well as external factors such as market trends, competition, regulatory changes, and technological advancements. These decisions are typically made with a long-term perspective, often spanning several years or even decades.

Examples of strategic decisions include:

1. Defining the organization's core business model and strategic positioning
2. Establishing long-term financial targets and growth objectives
3. Identifying new markets, products, or services for expansion or diversification
4. Restructuring or reorganizing the organization to improve efficiency and alignment with strategic goals
5. Developing and implementing corporate social responsibility and sustainability initiatives

While operational decision-making ensures the smooth execution of daily tasks, and tactical decision-making coordinates short-term objectives, strategic decision-making sets the overarching direction and vision for the organization. These three levels of decision-making are interdependent, with strategic decisions providing the framework, tactical decisions translating strategies into actionable plans, and operational decisions enabling the practical implementation of those plans. Effective organizational management requires a harmonious integration of all three decision-making processes to achieve long-term success and sustainable growth.

2.1.2. Decision making techniques and tools:

Decision-making techniques and tools encompass a wide range of structured methods, analytical frameworks, and instruments designed to facilitate informed and effective decision-making processes within organizations. These techniques and tools are invaluable resources that aid decision-makers in navigating complex scenarios, evaluating alternatives objectively, and arriving at well-reasoned decisions that align with organizational goals and priorities.

The significance of decision-making techniques and tools lies in their ability to bring structure, rigor, and objectivity to the decision-making process. They provide a systematic approach to gathering and analyzing relevant data, identifying and weighing various options, assessing potential risks and opportunities, and ultimately selecting the most favorable course of action. By leveraging these techniques and tools, organizations can mitigate cognitive biases, overcome information overload, and ensure that decisions are grounded in factual evidence and sound reasoning.

Some of the commonly used decision-making techniques and tools include: **Analytical Frameworks, Multi-Criteria Decision-Making (MCDM) Tools, Prioritization and**

Evaluation Techniques, Risk Assessment and Management Tools and Game Theory and Negotiation Tools. These decision-making techniques and tools are not mutually exclusive and can often be combined or integrated to address the specific needs and complexities of the decision-making situation at hand. Additionally, many organizations employ specialized decision support systems (DSS) that incorporate various analytical models, data visualization tools, and collaborative platforms to enhance the decision-making process further.

By leveraging these decision-making techniques and tools, organizations can foster a culture of data-driven, evidence-based decision-making, enabling them to navigate uncertainty, mitigate risks, and capitalize on opportunities more effectively. Ultimately, the effective application of these techniques and tools can contribute to improve decision quality, increase organizational efficiency and sustained competitive advantage.

2.1.3. The definition of support decision systems(DSS):

it was defined by Daniel J. Power in his book "Decision Support Systems: Concepts and Resources for Managers" that its: "Decision support systems are interactive computer-based systems that help decision-makers utilize data and models to solve unstructured problems. DSS are designed to support rather than replace decision-makers, and they focus on improving the effectiveness rather than the efficiency of decision processes." (Power, 2002)

While the founding father of the idea Ralph H. Sprague Jr. provides it us with the early definition of it which goes "An interactive computer-based system that helps decision-makers utilize data and models to solve unstructured problems." (Jr., 1980)

so it leads to the following definition:

Decision support systems are interactive, computer-based information systems that integrate data from multiple sources, apply advanced analytical models and computational tools, and leverage user-friendly interfaces to support and enhance the decision-making capabilities of individuals and groups within organizations. These systems are designed to assist decision-makers in addressing complex, unstructured, or semi-structured problems by providing them with timely, relevant, and comprehensive information, as well as analytical capabilities to evaluate alternatives, explore potential outcomes, and make well-informed decisions.

DSS are intended to augment, rather than replace, human decision-making processes by offering a structured approach to problem-solving and decision support. They facilitate the gathering, processing, and analysis of data from various internal and external sources,

enabling decision-makers to gain insights and identify patterns that might otherwise be overlooked. Through the application of analytical techniques such as statistical analysis, optimization models, simulations, and scenario analysis, DSS assist in generating and evaluating multiple options, assessing risks and uncertainties, and predicting potential consequences of different decision paths.

Furthermore, DSS provide decision-makers with user-friendly interfaces, interactive dashboards, and data visualization tools, allowing for effective communication and interpretation of complex information. These systems can adapt to different decision-making styles and preferences, empowering decision-makers to explore and manipulate data, test assumptions, and gain a deeper understanding of the problem at hand.

Ultimately, the primary objective of decision support systems is to enhance the quality, accuracy, and effectiveness of decision-making processes within organizations. By reducing cognitive biases, enabling comprehensive consideration of relevant factors, and facilitating the alignment of decisions with organizational goals and objectives, DSS contribute to better-informed choices, improved resource allocation, and increased organizational performance.

Decision support systems serve as powerful aids in decision-making, bridging the gap between raw data and actionable insights, and enabling organizations to navigate complex environments, respond to changing conditions, and capitalize on emerging opportunities in a timely and informed manner.

2.1.3.1. Type of decision support systems:

Decision support systems can utilize multiple models and techniques to aid in the decision making process. it can be highlighted that there is four main categories for them which are: **Model driving DSS Models, Data driving DSS Models, Knowledge driving DSS Models, and Communication driving DSS Models.**

➤ Model driving DSS Models:

the founding father of DSS Ralph H. Sprague Jr. in his book "Decision Support Systems: Putting Theory into Practice" that: "Model-driven DSS are designed around models that describe some portion of the decision-maker's world. These models are used to generate alternatives, to analyze the implications of alternatives, or to assist in the process of choosing among alternatives." (Jr, 1986)

While Daniel J. Power defined it in his books *Decision Support Systems: Concepts and Resources for Managers*: "Model-driven DSS are systems that use quantitative models to analyze decision situations. The models are the dominant component of the DSS, and they are designed to assist managers in analyzing a situation by applying analytical and quantitative capabilities to develop and evaluate appropriate alternatives." (Power, 2002)

So it can be defined as: Model-driven decision support systems (DSS) are designed to leverage the power of quantitative models to aid decision-makers in analyzing complex situations, generating and evaluating alternatives, and making informed choices. These systems incorporate a wide range of analytical models, including:

- ❖ ***Algebraic models***: Utilizing mathematical equations and relationships to represent and solve decision problems, such as linear programming and network models.
- ❖ ***Financial models***: Focused on financial analysis and decision-making, including models for net present value (NPV), internal rate of return (IRR), capital budgeting, and portfolio optimization.
- ❖ ***Decision analytic models***: Employing techniques like decision trees, influence diagrams, and multi-criteria decision analysis (MCDA) to systematically evaluate decision alternatives and assess potential outcomes.
- ❖ ***Simulation models***: Allowing decision-makers to create virtual representations of real-world systems and processes, such as Monte Carlo simulations, discrete event simulations, and system dynamics models.
- ❖ ***Optimization models***: Designed to find the best possible solution(s) by maximizing or minimizing specific objectives, subject to defined constraints, using techniques like linear programming, integer programming, and goal programming.

These quantitative models act as powerful decision support tools, enabling decision-makers to:

- Analyze complex data and scenarios by leveraging mathematical and statistical techniques.
- Formulate and structure decision problems in a systematic and logical manner.
- Generate and explore multiple alternatives and scenarios by manipulating model parameters and inputs.
- Evaluate the potential impacts and consequences of different decision choices through "what-if" analysis and sensitivity analysis.

- Identify optimal or near-optimal solutions based on specified objectives and constraints.
- Gain insights into the trade-offs and interdependencies between various decision variables and factors.

By integrating these models into DSS, decision-makers can benefit from sophisticated analytical capabilities, data-driven insights, and the ability to test assumptions and hypotheses. Model-driven DSS facilitate a more rigorous and evidence-based approach to decision-making, enabling organizations to make well-informed decisions that align with their goals and objectives while considering constraints and uncertainties.

➤ **Data driving DSS Models:**

Daniel J. Power on his book defined it such as: "Data driven DSS put the principal emphasis on manipulation of large databases that comprised many records of transactions or activities. Data-driven DSS analyze this data using tools that are tightly coupled with accessing, retrieving, manipulating, and analyzing the data." (Power, 2002)

While the trio of Efraim Turban, Ramesh Sharda, and Dursun Delen in their book "Decision Support and Business Intelligence Systems" defined it as follow:

Data-driven DSS are systems that analyze large pools of data to support decision making. They utilize techniques such as data mining, machine learning, and data warehousing to extract patterns and relationships from data for analysis and decision support." (Efraim Truban, Ramesh Sharda and Dursun Delen, 2001)

It can be defined as follows

Data-driven decision support systems are sophisticated computer-based information systems that leverage advanced data analytics techniques, including machine learning algorithms, artificial intelligence, and statistical modeling, to process and analyze large volumes of data from diverse sources. These systems are designed to support and improve decision-making processes across various domains and industries by providing data-driven insights, recommendations, and forecasts.

The core components of data-driven DSS models include:

1. **Data Integration:** Collecting and integrating structured and unstructured data from multiple sources, such as databases, sensors, IoT devices, social media, and external data repositories.
2. **Data Processing:** Employing big data technologies and distributed computing frameworks to store, process, and analyze large-scale, complex data sets in a timely and efficient manner.
3. **Advanced Analytics:** Utilizing a range of advanced analytical techniques, such as predictive modeling, optimization algorithms, simulations, natural language processing (NLP), and data mining, to uncover patterns, relationships, and trends within the data.
4. **Machine Learning and Artificial Intelligence:** Leveraging machine learning algorithms, including supervised, unsupervised, and reinforcement learning methods, as well as artificial intelligence techniques like deep learning and neural networks, to build predictive models and automate decision-making processes.
5. **Visualization and Interpretation:** Presenting data-driven insights, recommendations, and forecasts through intuitive visualizations, interactive dashboards, and interpretable models, enabling decision-makers to comprehend and act upon the information effectively.
6. **Decision Support:** Providing actionable recommendations and decision support based on the data-driven insights, empowering decision-makers to make well-informed, data-driven decisions that optimize outcomes, mitigate risks, and drive strategic initiatives.

Data-driven DSS models are versatile and can be applied across a wide range of industries and domains, including finance, healthcare, manufacturing, retail, transportation, energy, agriculture, and government, among others. By harnessing the power of data and advanced analytics, these systems enable organizations to gain a competitive advantage, improve operational efficiency, enhance customer experiences, and drive innovation through data-driven decision-making processes.

- **Knowledge driving DSS Models:** it was defined by the duo of Clyde W. Holsapple and Andrew B. Whinston in their book "Decision Support Systems: A Knowledge-Based Approach» as the followed:

Knowledge-driven decision support systems are computer-based systems that combine knowledge bases and inference engines to support decision-making. They are designed to emulate the problem-solving expertise of human experts in specific domains." (Clyde W. Holsapple and Andrew B. Whinston, 1996).

And it was defined by George M. Marakas in his book <Decision Support Systems in the 21st Century» as:

"Knowledge-driven decision support systems are specialized systems designed to solve complex, ill-structured problems by simulating human reasoning and decision-making processes. These systems rely on a knowledge base that captures and represents the knowledge and expertise of human experts in a specific problem domain." (Marakas, 2003)

It can be defined as:

Knowledge-driven decision support systems are computer-based information systems that leverage human knowledge, expertise, and reasoning to aid in the decision-making process for complex problems. These systems are designed to emulate human decision-making processes and provide recommendations based on a knowledge base engineered specifically for the problem domain.

The key aspects of knowledge-driven DSS include:

1. **Knowledge Acquisition:** Capturing and encoding human knowledge, expertise, and reasoning processes from subject matter experts, domain specialists, and experienced decision-makers. This knowledge can be represented in various forms, such as rules, cases, frames, or ontologies.
2. **Knowledge Representation:** Structuring and organizing the acquired knowledge into a comprehensive knowledge base using knowledge representation techniques, such as production rules, semantic networks, frames, or case-based reasoning.
3. **Inference Engine:** Employing an inference engine or reasoning mechanism that applies the encoded knowledge and problem-solving strategies to derive conclusions,

make inferences, or generate recommendations based on the user's inputs and the knowledge base.

4. **User Interaction:** Facilitating interactive and iterative decision-making processes by allowing users to provide inputs, ask questions, seek clarifications, and receive feedback or recommendations from the system during the problem-solving process.
5. **Heuristic Problem-Solving:** Incorporating heuristic problem-solving techniques, such as rule-based reasoning, case-based reasoning, or constraint-based reasoning, to handle complex, ill-structured problems that may not have a single optimal solution.
6. **Explanation and Justification:** Providing explanations and justifications for the recommendations or conclusions generated by the system, enhancing transparency and trust in the decision-making process.
7. **Learning and Adaptation:** Incorporating mechanisms for learning and adapting the knowledge base over time, either through user feedback, machine learning techniques, or the integration of new knowledge from experts or external sources.

Knowledge-driven DSS are particularly valuable in domains where human expertise and reasoning are critical, such as medical diagnosis, legal decision-making, financial analysis, risk assessment, and strategic planning. By codifying human knowledge and emulating human reasoning processes, these systems can assist decision-makers in solving complex, ill-structured problems that may be difficult to address through purely data-driven or model-based approaches.

The strength of knowledge-driven DSS lies in their ability to leverage human expertise, provide explanations and justifications for recommendations, and support iterative and interactive decision-making processes. They can be combined with other types of DSS, such as data-driven or model-driven systems, to create hybrid decision support systems that leverage both data and knowledge for enhanced decision-making capabilities.

- **Communication driving DSS Models:** It was defined by David J. Skyrme in his book *Knowledge Networking: Creating the Collaborative Enterprise* as:

"Communication-driven DSS are systems that enable decision-makers to collaborate and communicate effectively, facilitating the sharing of knowledge, ideas, and perspectives. These

systems leverage various communication technologies and collaborative tools to support group decision-making processes." (Skyrme, 1999)

and was defined by George M. Marakas in his book as : "Communication-driven DSS are designed to support group decision-making by facilitating communication and collaboration among decision-makers. They provide a range of communication tools, such as electronic messaging, video conferencing, and shared workspaces, to enable effective information exchange, idea generation, and coordination within decision-making groups." (Marakas, 2003)

also was defined by the duo of Ralph H. Sprague Jr. and Eric D. Carlson in their book "Building Effective Decision Support Systems" as: "Communication-driven DSS are designed to facilitate the transfer of information among decision participants. They provide computer-based facilities for messaging, conferencing, and coordinating the decision-making process." (Ralph H. Sprague Jr. and Eric D. Carlson , 1982)

so it can be defined as the following:

Communication-driven decision support systems are specialized information systems designed to facilitate effective communication, collaboration, and coordination among decision-makers involved in the decision-making process. These systems leverage various communication technologies and tools to enable seamless information sharing, idea exchange, and collective decision-making within groups or teams.

The key aspects of communication-driven DSS include:

1. **Communication Channels:** Integrating multiple communication channels, such as email, video conferencing, instant messaging, online discussion forums, and virtual whiteboards, to provide decision-makers with a range of options for real-time and asynchronous communication, depending on their preferences and requirements.
2. **Collaboration Tools:** Incorporating collaboration tools like shared workspaces, document repositories, and simultaneous editing capabilities to enable decision-makers to work together on shared documents, presentations, or project plans, fostering a collaborative environment for decision-making.
3. **Group Decision Support:** Facilitating group decision support by providing features like brainstorming tools, voting mechanisms, and decision matrices, which aid in

capturing and synthesizing diverse perspectives, evaluating alternatives, and reaching consensus among decision-makers.

4. **Knowledge Management:** Incorporating knowledge management capabilities, such as document repositories, wikis, and expert directories, to capture and share relevant knowledge, best practices, and lessons learned from previous decision-making processes, enabling informed decision-making based on collective organizational knowledge.
5. **Workflow Management:** Integrating workflow management tools to streamline and coordinate the decision-making process, ensuring that tasks, approvals, and follow-up actions are assigned and tracked effectively among decision-makers.
6. **Visualization and Analytics:** Providing data visualization and analytical tools to present relevant information, insights, and decision-making scenarios in a clear and comprehensible manner, supporting data-driven decision-making within the collaborative environment.
7. **Access Control and Security:** Implementing access control and security measures to ensure that sensitive information and decision-making processes are protected and accessible only to authorized decision-makers, maintaining confidentiality and integrity.

Communication-driven DSS models recognize that effective decision-making often involves multiple stakeholders with diverse perspectives, expertise, and geographical locations. By facilitating seamless communication, collaboration, and coordination among decision-makers, these systems aim to leverage the collective knowledge and insights of the team, foster a sense of ownership and accountability, and ultimately enhance the quality and acceptance of decisions made.

These systems can be particularly valuable in scenarios where decision-making involves geographically dispersed teams, cross-functional collaborations, or time-sensitive decision-making processes that require rapid coordination and input from multiple stakeholders.

In today's complex business landscape, decision-making processes often involve multifaceted challenges that require a holistic approach. While data-driven, knowledge-driven, and

communication-driven DSS models each offer distinct capabilities, their true potential lies in their synergistic integration. By combining and harmonizing these different models, organizations can create a powerful decision support ecosystem that leverages the strengths of each approach, resulting in more informed, collaborative, and effective decision-making processes.

The integration of different DSS models can be achieved through the following strategies:

1. **Modular Architecture:** Developing a modular DSS platform or framework that seamlessly incorporates the functionalities of data-driven, knowledge-driven, and communication-driven models. This approach allows decision-makers to access and utilize the specific capabilities they need based on the decision-making context and requirements.
2. **Hybrid Systems:** Designing hybrid DSS that intelligently blend the features of different models within a single system. For instance, a hybrid system could combine data analysis capabilities with knowledge-based reasoning and collaborative decision-making tools, providing a unified solution for decision support.
3. **Interoperability and Integration:** Ensuring interoperability and integration between separate DSS models, enabling data and information exchange, and facilitating the seamless flow of decision support processes across different systems.
4. **User-Centric Design:** Adopting a user-centric design approach that considers the diverse decision-making styles, preferences, and requirements of decision-makers within the organization. This ensures that the integrated DSS solution caters to individual needs while promoting widespread adoption and effective utilization.

By integrating different DSS models, organizations can leverage the following benefits:

1. **Comprehensive Decision Support:** Addressing the full spectrum of decision-making needs, from data analysis and pattern recognition (data-driven) to leveraging human expertise and knowledge (knowledge-driven) and fostering collaboration and coordination (communication-driven).
2. **Enhanced Decision Quality:** Improving the quality of decisions by drawing insights from multiple sources, including data analytics, human expertise, and diverse perspectives, resulting in more well-rounded and informed decision-making processes.

3. **Efficiency and Productivity:** Streamlining decision-making processes by providing a cohesive and integrated support system, reducing redundancies, and enabling seamless transitions between different decision support activities.
4. **Adaptability and Scalability:** Offering a flexible and scalable solution that can adapt to changing business needs, evolving decision-making requirements, and organizational growth, ensuring long-term viability and effectiveness.

Furthermore, the integration of different DSS models can be tailored to specific industry domains, organizational structures, and decision-making contexts, allowing for customized and optimized decision support solutions that align with the unique requirements of each organization.

By embracing the power of integrated decision support systems, organizations can unlock a competitive advantage, foster innovation, and drive strategic decision-making processes that are data-driven, knowledge-infused, and collaboratively supported, ultimately leading to better outcomes and sustained success in an ever-changing business environment.

2.1.3.2. Analytical Frameworks:

it was defined by the duo of Gerald I. Kendall and Steven C. Rollins in their books "Advanced Project Portfolio Management and the PMO" as followed:

"Analytical frameworks provide a structured approach to breaking down complex problems or issues into their component parts, allowing for a more detailed examination of each part and the relationships among them." (Gerald I. Kendall and Steven C. Rollins , 2003)

And it was said by Ralph L. Keeney in his book "Value-Focused Thinking: A Path to Creative Decision-making" as: Analytical frameworks serve as an organized procedure for identifying and articulating fundamental objectives, developing alternatives, and evaluating and integrating their impacts to guide decision-making." (Keeney, 1992)

so it can be defined as the following: Analytical frameworks are structured and logical approaches that serve as robust foundations for conducting comprehensive data analysis and guiding informed decision-making processes within organizations. These frameworks are meticulously designed to help organizations identify and evaluate key factors, interpret complex information, uncover critical relationships, and systematically generate, compare, and assess potential solutions.

The strength of analytical frameworks lies in their multidisciplinary nature, drawing upon diverse fields such as economics, psychology, design, engineering, and management sciences. This cross-pollination of knowledge allows for the development of customized and adaptable frameworks that can be tailored to address specific organizational needs, contexts, objectives, and evaluation criteria.

Analytical frameworks act as powerful instruments for clarifying complex problems, breaking them down into manageable components, and identifying relevant data sources. They provide a systematic and organized approach to data analysis, enabling organizations to extract insights, generate alternative solutions, and rigorously evaluate each option against predefined criteria.

Furthermore, these frameworks facilitate effective communication of recommendations by presenting findings and proposed solutions in a structured and compelling manner, supported by data-driven evidence and robust analysis. This transparency and clarity in communication enhance decision-makers' understanding and confidence in the recommended course of action.

Some key characteristics and benefits of analytical frameworks include:

1. **Structured Approach:** They offer a clear and logical step-by-step process for problem-solving, reducing the risk of overlooking critical factors or making hasty decisions based on incomplete information.
2. **Multidimensional Analysis:** Analytical frameworks encourage a comprehensive examination of problems from multiple perspectives, considering various stakeholder interests, potential impacts, and unintended consequences.
3. **Objectivity and Impartiality:** By relying on data, evidence, and predefined criteria, analytical frameworks help mitigate cognitive biases and personal preferences, fostering objective and impartial decision-making.
4. **Repeatability and Consistency:** The structured nature of analytical frameworks ensures that decision-making processes are consistent and repeatable, enabling organizations to establish best practices and maintain high standards.

5. **Adaptability and Scalability:** These frameworks can be tailored to suit diverse organizational contexts, problem complexities, and decision-making requirements, making them versatile and scalable tools.

Analytical frameworks encompass a wide range of techniques and methodologies, including but not limited to SWOT analysis, cost-benefit analysis, decision trees, scenario planning, risk assessment models, and multi-criteria decision-making tools. Organizations often integrate multiple analytical frameworks or combine them with other decision support systems to create comprehensive decision-making ecosystems.

By embracing analytical frameworks, individuals and organizations can navigate complex decision-making scenarios with greater confidence, rigor, and objectivity. These frameworks serve as invaluable guides, enabling organizations to make well-informed decisions that align with their strategic objectives, maximize value creation, and drive sustainable growth and success.

2.1.3.2. Multi-Criteria Decision-Making (MCDM) Tools:

Thomas L. Saaty said that: "The Analytic Hierarchy Process (AHP) is an MCDM tool that provides a comprehensive and rational framework for structuring a decision problem, representing and quantifying its elements, relating those elements to overall goals, and evaluating alternative solutions." (Saaty, 1980)

and it was noted by the duo of Enrique Herrera-Viedma, Francisco Herrera, and Janusz Kacprzyk in their book "Fuzzy Multi-Criteria Decision-Making Techniques and Applications" as: "MCDM tools are mathematical techniques that aim to assist decision-makers in choosing the best alternative or ranking alternatives when multiple, often conflicting, criteria are present." (Enrique Herrera-Viedma, Francisco Herrera, and Janusz Kacprzyk, 2021)

So it can be defined as:

Multi-Criteria Decision-Making (MCDM) tools are specialized analytical instruments designed to facilitate decision-making processes that involve evaluating and selecting alternatives based on multiple, often conflicting, criteria or objectives. These tools provide a structured and systematic framework for assessing and comparing options, enabling decision-makers to make well-informed choices by considering and weighing various factors simultaneously.

The strength of MCDM tools lies in their ability to handle complex decision-making scenarios where multiple criteria, objectives, or stakeholder perspectives need to be taken into account. By integrating these diverse considerations into a unified decision-making process, MCDM tools help mitigate the risk of overlooking critical factors or relying solely on intuition or single-factor analysis.

Some key characteristics and benefits of MCDM tools include:

1. **Multi-Criteria Evaluation:** MCDM tools allow decision-makers to evaluate alternatives against a comprehensive set of criteria, which can include both quantitative and qualitative factors, such as cost, performance, environmental impact, stakeholder preferences, and risk factors.
2. **Criteria weighting and Prioritization:** These tools facilitate the assignment of weights or priorities to different criteria, reflecting their relative importance in the decision-making process. This enables decision-makers to account for the varying significance of different factors.
3. **Structured Approach:** MCDM tools provide a systematic and structured approach to decision-making, breaking down complex problems into manageable components and guiding decision-makers through a logical sequence of steps, from criteria identification to alternative evaluation and selection.
4. **Transparency and Traceability:** MCDM tools promote transparency and traceability in the decision-making process by documenting the criteria, weightings, and rationale used in evaluating and selecting alternatives. This transparency enhances accountability and facilitates communication with stakeholders.
5. **Sensitivity Analysis:** Many MCDM tools incorporate sensitivity analysis capabilities, allowing decision-makers to examine the robustness of their decisions by varying criteria weights or parameter values, providing insights into the impact of changing assumptions or priorities.
6. **Collaborative Decision-Making:** Certain MCDM tools, such as group decision support systems, facilitate collaborative decision-making by enabling multiple stakeholders to participate in the process, share their perspectives, and reach consensus through structured deliberations.

Widely used MCDM tools and techniques include the Analytic Hierarchy Process (AHP), Analytic Network Process (ANP), TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution), ELECTRE (Elimination and Choice Translating Reality), PROMETHEE (Preference Ranking Organization Method for Enrichment Evaluations), and decision matrices.

By leveraging MCDM tools, organizations can enhance the transparency, consistency, and efficiency of their decision-making processes, particularly in situations involving conflicting objectives, multiple stakeholders, or complex trade-offs. These tools enable decision-makers to navigate intricate decision scenarios with greater confidence, objectivity, and accountability, ultimately leading to better-informed choices that align with organizational goals and stakeholder interests.

- **Prioritization and Evaluation Techniques:**

Prioritization and Evaluation Techniques defined by Stephen R. Covey from his book «The 7 Habits of Highly Effective People» as:

"Prioritization is the ability to determine what is most important and what is least important and to organize your life around the things that are most important. Prioritizing means spending time on the things that really matter, instead of allowing the urgent to crowd out the important." and he also introduced the ABCD method that compose of: A stands for "Acute" or must do, B for "Big Rocks" or important tasks, C for "Consolation" or small tasks, D for "Delegate" or tasks to assign to others, and E for "Eliminate" or tasks to remove. (Covey, 1989).

And it was defined by Nadia Almanac on her book "Prioritize: The Smart Way to Prioritize for Productivity" as:

"Prioritization is the act of deciding what to focus on and in what order to work on tasks, projects, or goals. Effective prioritization involves identifying the most important items, evaluating their relative importance, and allocating time and resources accordingly." (Almanac, 2021).

so it can be defined as: Prioritization and Evaluation Techniques are invaluable tools that empower individuals and teams to make informed decisions, optimize resource allocation, and

achieve their goals efficiently. These techniques provide structured frameworks for assessing and ranking tasks, objectives, projects, or goals based on predetermined criteria, enabling decision-makers to prioritize their efforts and focus on the most critical and impactful activities.

One widely adopted Prioritization and Evaluation Technique is the ABCDE Method, renowned for its simplicity and effectiveness in managing daily tasks, project planning, and decision-making processes. This method involves categorizing tasks or items into five distinct levels of priority:

A - Must Do: These tasks are of the highest priority and are critical to achieving your goals or meeting essential obligations. They are typically time-sensitive and have significant consequences if not completed.

B - Should Do: These tasks are important but may not be as urgent as the "A" tasks. They contribute to your goals and objectives but can be postponed or rescheduled if necessary.

C - Could Do: These tasks are desirable but not essential. They may represent opportunities for growth, personal development, or additional value creation, but they are not critical to your core objectives.

D - Delegate: These tasks can be delegated or outsourced to others, freeing up your time and resources to focus on higher-priority activities.

E - Eliminate: These tasks are of little or no value and can be eliminated or removed from your list, as they do not contribute significantly to your goals or priorities.

By categorizing tasks using the ABCDE Method, decision-makers can gain clarity on their priorities and allocate their time and resources accordingly. This technique promotes focus and discipline, ensuring that the most critical tasks are addressed first, while less important or non-essential tasks are deprioritized or eliminated.

In addition to the ABCDE Method, other Prioritization and Evaluation Techniques include:

1. **Stack Ranking (Relative Prioritization):** Ranking items based on their importance relative to one another, often using a numerical scale.
2. **Top-n Prioritization:** Evaluating and ordering a set of items from best to worst based on value, impact, or other relevant metrics.

3. **Weighted Scoring Prioritization:** Assigning weights or scores to multiple criteria, allowing for a more comprehensive evaluation and prioritization of tasks or projects.
4. **MoSCoW Method:** Categorizing requirements or tasks as Must have, Should have, Could have, and Won't have, based on their criticality and urgency.
5. **Pareto Principle (80/20 rule):** Focusing on the critical 20% of tasks or activities that yield 80% of the desired outcomes.

By leveraging Prioritization and Evaluation Techniques, individuals and teams can make well-informed decisions, allocate resources judiciously, and foster a culture of productivity and efficiency. These techniques are invaluable tools for project management, task prioritization, and strategic decision-making, enabling organizations to achieve their goals while optimizing time, effort, and resources.

- **Risk Assessment and Management Tools:**

in his book Gregory P. Howell titled "What is Lean Construction?" defined it as: Risk assessment and management tools are techniques and methods used to identify, analyze, and respond to risks in construction projects, with the aim of minimizing potential negative impacts and maximizing opportunities." (Howell, 2011)

In the topic of ISO there is a book that defined it by Dale F. Cooper, P. E., Albert S. Endres, and Brian D. Corps in their book as "Risk assessment and management tools are systematic processes and techniques used to identify, analyze, evaluate, treat, monitor, and communicate risks throughout the project life cycle." (Dale F. Cooper, P. E., Albert S. Endres, and Brian D. Corps, 2021)

So it can be defined as:

Risk Assessment and Management Tools are essential techniques used to identify, evaluate, and mitigate potential risks across various contexts, including project management, quality management, safety, security, and business operations. These tools empower decision-makers to make informed choices, prioritize actions, and minimize the impact of risks.

Some widely used Risk Assessment and Management Tools include:

1. **Risk Matrix:** A visual representation that prioritizes risks based on their probability and impact, guiding risk mitigation strategies.

2. **Failure Mode and Effects Analysis (FMEA):** A proactive tool that identifies potential failures, their causes, and effects during the design or proposal stage.
3. **Decision Tree:** A model that calculates and visualizes the values and likelihoods of different outcomes, aiding in risk-based decision-making.
4. **Bowtie Model:** A tool that links risk sources and consequences, mitigating risks associated with rare, high-impact events.
5. **Risk Register:** A centralized repository for identifying, describing, prioritizing, and assigning ownership of risks, facilitating risk management.
6. **Root Cause Analysis:** A technique that identifies the underlying causes of problems, enabling effective risk mitigation by addressing root causes.
7. **SWOT Analysis:** A strategic planning tool that identifies internal Strengths, Weaknesses, and external Opportunities and Threats, supporting risk assessment.
8. **Probability and Impact Matrix:** A tool that assesses the likelihood and potential impact of risks, guiding risk prioritization and response.
9. **Risk Data Quality Assessment:** A method that ensures the accuracy and reliability of risk data, improving the overall quality of risk management processes.

By leveraging these Risk Assessment and Management Tools, organizations can make well-informed decisions, prioritize risk mitigation efforts, and foster a proactive risk management culture, ultimately enhancing operational resilience and achieving strategic objectives.

2.2. The decision making process:

We will speak here on the decision making process, that range from definition to limitation.

2.2.1. The definition of decision making process:

Garry Klein defined the decision making process in his book as: «The decision-making process involves the rapid recognition of patterns, the mental simulation of possible courses of action, and the selection of the most appropriate response based on experience and intuition." (Klein, 1998)

And such did Daniel Kahneman in his book "Thinking, Fast and Slow" defined it as: "The decision-making process is influenced by two distinct systems of thinking: the fast, intuitive,

and emotional System 1, and the slow, deliberative, and logical System 2. Understanding the interplay between these systems is crucial for making effective decisions." (Kahneman, "Thinking, Fast and Slow", 2011)

And finally it, it was mentioned by Max H. Bazerman and Don A. Moore in their book "Judgment in Managerial Decision Making" as the following: The decision-making process is a complex and multifaceted cognitive activity that involves the integration of various factors, including information processing, judgment, and choice, which can be influenced by individual, interpersonal, and organizational factors." (Max H. Bazerman and Don A. Moore, 2012)

So in conclusion of the definition of authors it can be defined as:

The decision-making process is a structured, systematic approach that decision-makers follow to identify the best course of action for a given problem or situation. This process typically involves the following key steps:

1. **Problem/Opportunity Identification:** The first step is to clearly define the decision that needs to be made, by identifying the problem at hand or the opportunity that requires action.
2. **Information Gathering:** The decision-maker collects relevant data, facts, and information from various sources to gain a comprehensive understanding of the decision context.
3. **Alternative Generation:** The decision-maker then generates and evaluates multiple alternative solutions or courses of action that could potentially address the problem or capitalize on the opportunity.
4. **Evaluation and Selection:** The alternatives are thoroughly evaluated based on predefined criteria, such as feasibility, cost, risk, and alignment with organizational goals. The best alternative is then selected as the optimal decision.
5. **Implementation and Monitoring:** The chosen solution is implemented, and the decision-maker monitors the outcome, making adjustments as necessary to ensure the desired results are achieved.

Throughout this process, decision-makers may also need to consider the potential consequences, risks, and ethical implications of their choices, as well as solicit input from relevant stakeholders to make informed and well-rounded decisions.

By following this structured approach, decision-makers can navigate complex situations, leverage relevant information, and select the most appropriate solution to effectively address the problem or capitalize on the opportunity at hand.

2.2.2 the process of decision making decision:

it can be said that exists seven key steps for decision making which are:

- **Identify the Decision:**

The first step is to clearly define the decision that needs to be made. This involves thoroughly understanding the problem or opportunity at hand, determining the objectives, and ensuring the decision to be made is well-defined and aligned with the organization's or individual's goals.

- **Gather Information:**

The decision-maker then collects relevant data, facts, and information from a variety of sources, both internal and external to the organization or individual. This step involves researching, analyzing, and synthesizing the gathered information to gain a comprehensive understanding of the decision context.

- **List Alternatives:**

Based on the information collected, the decision-maker generates a list of possible alternative solutions or courses of action that could effectively address the identified problem or opportunity. This step encourages creative thinking and the exploration of diverse options.

- **Assess the Alternatives:**

The decision-maker thoroughly evaluates each alternative, considering factors such as feasibility, resource requirements, potential risks and benefits, and alignment with the established objectives. This assessment may involve the use of analytical tools, decision matrices, or other evaluation techniques to objectively compare the alternatives.

- **Select the Best Alternative:**

After carefully analyzing the alternatives, the decision-maker selects the most suitable option based on the evaluation criteria, personal values, and the overall alignment with the desired outcomes. This step involves making a well-informed choice among the available alternatives.

- **Implement the Decision:**

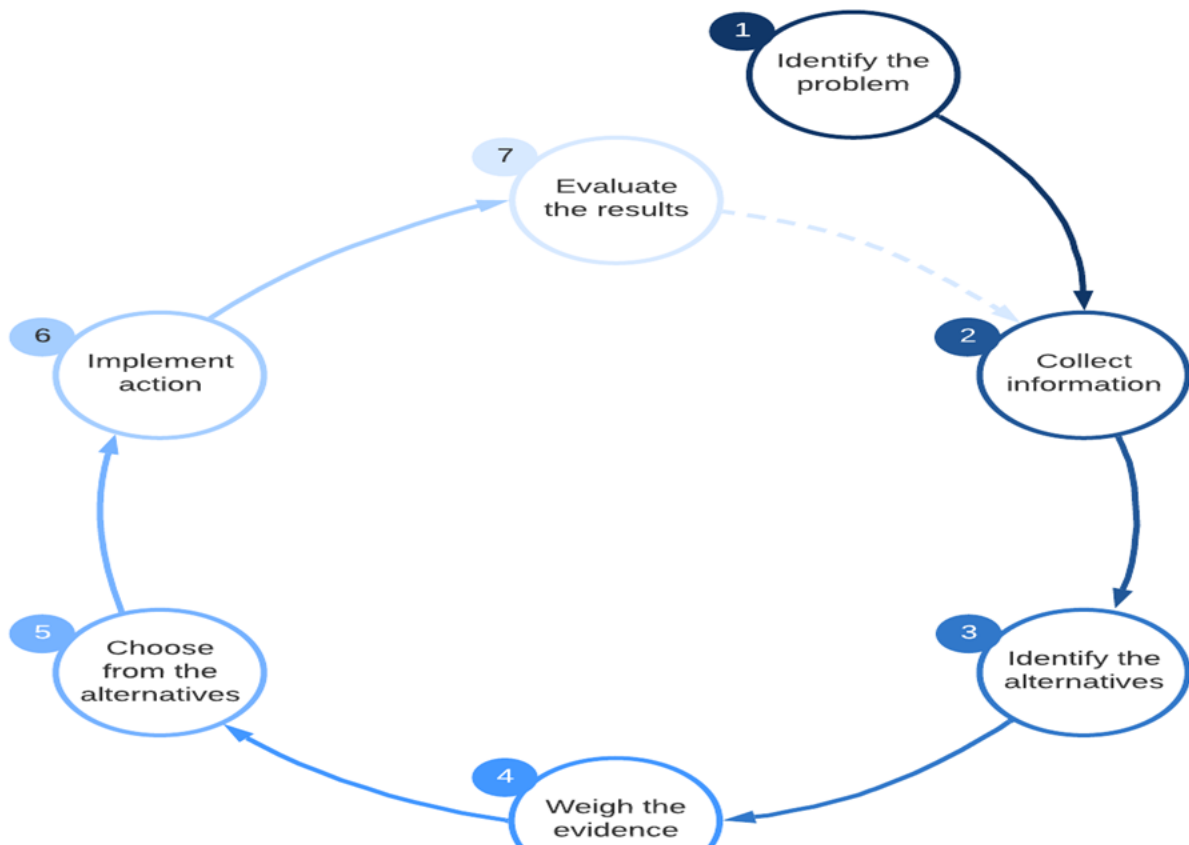
Once the best alternative has been chosen, the decision-maker takes the necessary actions to put the decision into practice. This may involve developing an implementation plan, allocating resources, communicating the decision to relevant stakeholders, and addressing any potential barriers or challenges that may arise during the implementation process.

- **Review the Decision:**

The final step in the decision-making process is to review and evaluate the results of the implemented decision. The decision-maker assesses whether the desired outcomes have been achieved, identifies any unintended consequences, and determines if further actions or adjustments are required. This step helps to ensure continuous improvement and facilitates learning for future decision-making scenarios.

source: (lucidchart)

Figure 4 The following diagram shows the decision making



2.2. Contributions of strategic intelligence to decision-making:

strategic intelligence is the process of collecting, analyze and diffusion of data to support the strategic decision making in organization. it necessary if not a crucial role and step that organization must do to take and have a good decision making process.

Strategic intelligence helps the decision making in several and multiple ways:

Strategic intelligence plays a crucial role in supporting effective decision-making for organizations. Here are several ways in which it can benefit the decision-making process:

1. Risk and Uncertainty Identification:

Strategic intelligence helps decision-makers identify and assess potential risks and uncertainties in the operating environment. By providing comprehensive and up-to-date

information, it allows decision-makers to be well-informed about the current situation and potential challenges that may arise. This knowledge empowers them to make more informed and proactive decisions.

2. Competitor Analysis:

Strategic intelligence can offer valuable insights into the organization's competitors, including their products, services, strategies, and market positioning. This information can give decision-makers a better understanding of the competitive landscape, enabling them to make more informed strategic choices, such as product development, pricing, and market positioning.

3. Opportunity Identification:

Strategic intelligence can help organizations identify new market opportunities and emerging trends. By gathering and analyzing data from various sources, it can uncover untapped market segments, changing customer preferences, and innovative technologies that the organization can leverage. This insight allows decision-makers to make informed decisions about new product development, market expansion, or diversification strategies.

4. Informed Decision-Making:

With the comprehensive information provided by strategic intelligence, decision-makers can make more informed and well-grounded decisions. They can assess the potential impact of various options, weigh the risks and rewards, and align their decisions with the organization's overall strategic objectives. This can lead to more effective and successful outcomes.

5. Adaptability and Responsiveness:

Strategic intelligence can help organizations become more adaptable and responsive to changing market conditions. By continuously monitoring the environment, decision-makers can quickly identify and respond to emerging threats and opportunities, allowing the organization to stay ahead of the curve and maintain a competitive edge.

6. Resource Allocation:

Strategic intelligence can inform the efficient allocation of organizational resources, such as capital, human resources, and technology. By providing insights into market trends, customer

needs, and competitive dynamics, it enables decision-makers to make more informed decisions about where to invest resources for maximum impact and return on investment.

7. Scenario Planning:

Strategic intelligence can support scenario planning, where decision-makers explore different potential future scenarios and develop strategies to address them. By identifying key drivers of change and potential disruptors, strategic intelligence helps organizations be better prepared for various contingencies.

8. Early Warning Signals:

Strategic intelligence can help detect early warning signals of emerging trends, technological developments, or competitive moves. This allows decision-makers to proactively respond to these signals, rather than being caught off guard, and potentially gain a first-mover advantage.

9. Organizational Alignment:

By providing a shared understanding of the external environment, strategic intelligence can help align different departments and functions within the organization. This alignment enables more cohesive and coordinated decision-making, ensuring that the organization is moving in a unified strategic direction.

10. Stakeholder Management:

Strategic intelligence can inform how organizations engage with and manage their stakeholders, such as customers, suppliers, regulators, and investors. By understanding the needs, concerns, and priorities of these stakeholders, decision-makers can make more effective decisions that address stakeholder interests and maintain strong relationships.

11. Strategic Foresight:

Strategic intelligence can support strategic foresight, which involves anticipating and preparing for future possibilities. By scanning the environment for emerging trends, disruptive technologies, and potential black swan events, strategic intelligence helps decision-makers develop a more forward-looking and proactive approach to strategy development.

12. Continuous Improvement:

The insights gained from strategic intelligence can help organizations continuously evaluate and improve their decision-making processes. By identifying areas for improvement, organizations can refine their information gathering, analysis, and decision-making practices, leading to more effective and efficient decision-making over time.

2.4. Limitations and difficulties of decision making and strategic intelligence:

Although both have their advantages the decision making and strategic intelligence have their set of problems and difficulties' which are:

A) difficulties and limitation of strategic intelligence:

Incomplete or Inaccurate Information:

Strategic intelligence is heavily reliant on data, and if the underlying information is incomplete or inaccurate, it can lead to flawed analysis and suboptimal decision-making. Ensuring the quality and reliability of data sources is crucial.

Information Overload:

While detailed information is often necessary to provide comprehensive understanding, an excessive amount of data can overwhelm decision-makers, obscuring the key insights and making the intelligence less useful. Effective data management and prioritization are essential to avoid information overload.

Lack of Timeliness:

The value of strategic intelligence lies in its ability to inform timely decision-making. Delays in gathering, analyzing, and disseminating intelligence can result in missed opportunities or ineffective responses to emerging threats and trends. Streamlining the intelligence process and leveraging real-time data sources can help address this challenge.

Bias and Subjectivity:

Human biases, preconceptions, and subjective interpretations can influence the analysis of intelligence, leading to skewed conclusions and decisions. Employing a diverse team of analysts, implementing robust validation processes, and fostering a culture of objectivity can help mitigate the impact of bias.

Resource Constraints:

Limited resources, both in terms of budget and skilled personnel, can impede the effectiveness of strategic intelligence efforts. This can affect the depth, breadth, and quality of analysis. Careful resource allocation, leveraging technology, and developing strategic partnerships can help organizations overcome resource constraints.

Technological Challenges:

Rapid advancements in technology require organizations to continuously update their tools and capabilities to effectively gather, analyze, and disseminate intelligence. Keeping pace with technological changes and incorporating innovative solutions can enhance the efficiency and effectiveness of strategic intelligence operations.

Complexity of the Global Environment:

The interconnected and rapidly changing global landscape poses challenges in predicting and understanding the implications of various events and trends on an organization's strategic objectives. Developing a comprehensive understanding of the evolving global dynamics and fostering cross-functional collaboration can help organizations navigate this complexity.

Security and Confidentiality Concerns:

Ensuring the security and confidentiality of sensitive intelligence data is crucial but can be challenging, especially in the face of cyber threats and data breaches. Implementing robust cybersecurity measures, data governance protocols, and employee training can help mitigate these risks.

Resistance to Change:

Implementing strategic intelligence practices may face resistance from within the organization due to cultural barriers, lack of awareness, or reluctance to adopt new methodologies. Effective change management, communication, and leadership support can help overcome this resistance and foster a culture that values strategic intelligence.

Ethical and Legal Considerations:

Adhering to ethical standards and legal requirements in the collection and use of intelligence data is essential but can present challenges, especially in cross-border operations. Developing clear policies, ensuring compliance, and fostering a culture of ethical decision-making can help organizations navigate these complex issues.

B) The Limitations and difficulties of decision making:

Time Constraints:

The decision-making process can be inherently time-consuming, especially when dealing with complex, multi-faceted issues that require in-depth analysis. This can lead to delays in responding to time-sensitive situations and hinder the organization's ability to capitalize on emerging opportunities or mitigate emerging threats.

Compromised Objectivity:

Decisions can be unduly influenced and impacted by external factors, such as political pressures, social dynamics, or vested interests, which may not align with the organization's long-term strategic objectives or the interests of its stakeholders. Maintaining objectivity and focus on the organization's core priorities is crucial.

Cognitive Biases:

Personal biases, preconceptions, and subjective interpretations can lead to flawed decision-making, resulting in suboptimal outcomes that may not serve the organization or its stakeholders effectively. Acknowledging and mitigating the impact of cognitive biases is essential for sound strategic decision-making.

Incomplete or Misleading Information:

Decisions can be constrained by the available data and the limitations of the analytical capabilities employed. Incomplete, inaccurate, or misinterpreted information can lead to faulty conclusions and suboptimal decisions. Strengthening data-gathering processes and enhancing analytical capabilities are critical to address this challenge.

Uncontrollable Factors:

Organizations often face decisions that are influenced by a myriad of internal and external factors that are beyond their direct control, such as market fluctuations, technological disruptions, or geopolitical instability. Developing scenario planning and risk management strategies can help organizations navigate these uncontrollable factors more effectively.

Bounded Rationality:

Decision-makers operate within the constraints of their available information, cognitive capacities, and the finite time they have to make decisions. These limitations can lead to the adoption of simplified models and heuristics that may not fully capture the complexity of the problem at hand, potentially resulting in suboptimal decisions.

Cognitive Overload:

The complexity of strategic decision-making, with its multiple alternatives, attributes, and interdependencies, can exceed the cognitive capacity of individual decision-makers. This can lead to difficulties in accurately processing and evaluating all relevant information, potentially resulting in suboptimal choices.

Observational Biases:

Reliance on observational studies for decision-making can be impacted by confounding factors, selection bias, and the use of retrospective data, leading to unreliable or inaccurate conclusions. Careful consideration of the study design, data quality, and potential biases is essential.

Critical Appraisal Challenges:

The critical appraisal of observational studies used to inform strategic decisions can be a complex and challenging task, requiring deep expertise and diligent evaluation of factors such

as bias, confounding variables, and data integrity. Developing robust processes and guidelines for critical appraisal can enhance the reliability of the decision-making process.

Conclusion:

We have divided this part into two following sectors the first sector spoke about the review literature based on all reaches that were available on strategic intelligences and decision making. It can be mentioned that there were huge issues in finding researcher relating to strategic intelligences' due to lack of expert's in the field. And for the second we spoke about all the information that will speak about in our research. and for the next part we will speak on the case study and the methodology in use.

Chapter II

Methodological Frame

Introduction: in this chapter we will introduced the researcher methodology adapted for this study.

We will speak and mention all the tools and techniques that we used for collect the data relating to the problematic. And we will also describe the hosting organization and the department and their stricture that help us and mentored us to achieve our studies goals.

Section 1: Methodological frame:

we will speak her on the methods, tools and practices that we used in the study.

1.1. Methodological approach:

This research employs a qualitative, single case study approach to investigate how strategic intelligence informs decision-making within an organizational context. The case study method

enables real-world phenomena to be studied in depth in their natural setting. Given that strategic intelligence is deeply embedded within the organization, a case study is an appropriate method. this method uses interviews, observation and collect and analysis of documents.

1.2. Qualitative information acquisition approaches:

The definition of Creswell said on his book:

Qualitative researchers collect data themselves through examining documents, observing behavior, and interviewing participants. They may use an instrument, but it is one designed by the researcher using open-ended questions. They do not tend to use or rely on questionnaires or instruments developed by other researchers. (Creswell, 2010)

After careful searching and reading publications and studies, and discussions with couple of experts and professors, we came to the conclusion of the approach qualitative which is the most optimal and best suited for our purpose and our studies. This approach composes of observation, interviews with the Department boss of the strategic intelligence, environment and standards and the directors of the DMQ and also the analysis of documents.

1.2.1. Analysis of documents:

Alongside the data that was collected by interviews and observation, we took the liberty to discover other information sources relating to our study, specially information obtained in the departments DMQ and Strategic and Regulatory Environmental Monitoring, also from websites and general information. We took in wide studies theories about strategic intelligence and decision making process and all the systems and methods that were available. also we took and studies information's and thesis's available on the liberty in the National Higher School of Management (ENSM) and articles and books from internet.

1.2.2. observation:

In the published work of Michael Quinn Patton mentioned that:

“Observational data refers to descriptions of activities, behaviors, actions, conversations, interpersonal interactions, organizational processes, or any other aspect of observable human experience.” (Patton, 2015)

And said by Sharan B. Merriam on her book that:

"Observation is a research tool when it is systematically planned, recorded, subjected to checks and controls on validity and reliability, and integrated into a coherent description, analytic explanation or theoretical framework." (Merriam, 2009)

So we conclude that on the method of observation, the degree of participation differs on the people that participated, the time and the nature of the study itself and there for there is two types of observation:

- observation quantitative:

The researcher collects numeric data using methods and tools that were pre made for example number of students in one school, number of worker that own health care.

- observation qualitative:

The qualitative observation is less structured and more organic as the researcher don't use specific methods or structures is up to the researcher himself to use his skills to collect and obtain notes.

1.2.3. Interviews:

Irving Seidman spoke on the interview topic on his book:

"At the root of in-depth interviewing is an interest in understanding the lived experience of other people and the meaning they make of that experience." (Seidman, 2006)

So observations are method based on face to face and the idea is the ability of talking about sensitive subjects, life experiences or collect data that it's hard to obtain with normal research methods. it allows us to understand point views, opinion and state of mind of the interviews. this method is based on the trust that the interviews has with the researcher for the integrity of the research or topic in hand and there is two type of interviews: The directive interview and semi-direct interview

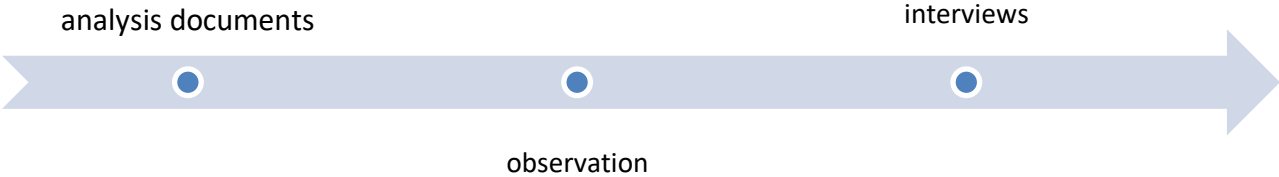
- The directive interview:

it's based on asking the interviews series of questions and receive the same answers in the same order and at the same way prepared in advance. The searcher must be neutral, focusing on rational rather than emotional issues. the questions can be pre made and structured or open questions that give the liberty to interviews to answer.

- semi-directive interview:

The semi-direct interview is a form of unstructured, open-ended, and in-depth interview. Unlike a structured interview, the researcher's role is more of a facilitator, guiding the dialogue rather than strictly following a predetermined set of questions. This approach allows the researcher to gain a deeper understanding of the participants' thoughts and behaviors, without being constrained by pre-existing hypotheses. The semi-direct interview enables the participants to express themselves freely, leading to richer and more insightful data collection.

Figure 5: shows the process of the steps of interviews



source Established by ourselves

1.3. Interviews selections:

After observation in the frame of selection of interviewees, we had the opportunity of choosing non-probability sampling known as “sampling by judgment” due it based on the judgment of reachercher and in our case we have chosen our condiments’ according to their expertise in the field and their rank in the DMQ and strategic intelligence departments as well as their knowledge and interest in so we had the opportunity to select all the managers in the both departments.

the interviews are based on face to face questions that are open ended.

Table 6: shows the Research guiding architectural plan

Method	Semi-directed interviews realized based on face to face
Objective of analyses	Understanding the impact of strategic intelligence on decision making
Number of cases	2

Target audience	DMQ and strategic intelligence departments
Number of interviews	2
Average duration per interview	30 to 45 min

1.4. Descriptive data capture technique:

Our study was based on the semi-structured interviews, we have prepared an interview guide, addressed to the QDM and Strategic and Regulatory Environmental Monitoring. The number of the interviews were 2. The interview helps to understand the selected process in the study which allowed the interviews express their ideas deepen each question equality.

The interview guide (**Annex B**) it was structured on two main bases:

The first bases were based on small introduction in which we provided our general information (last name, first name, specialty) as well as the theme of our study. Then, the principle main objective of the research was presented. Furthermore, we gaved the incurrence to the interviewees the full anonymity of their responses. Also was mentioned that all the information's was only used for the research purpose only. Finally, thanks were expressed to the responsible for the time they gave us to answer our questions.

The second bases were dedicated to the different section named:

- General questions
- Data collection and analysis
- Decision making integration
- Challenges and improvements
- Organizational alignment

1.5. Analysis blueprint:

This involves analyzing results of the interviews

Section 2: Presentation of the organization:

Our internship was carried out at the level Management Quality Department (MQD), Strategic and Regulatory Environmental Monitoring at the national company of Local Development Bank (BDL). BDL is a prominent financial institution that plays a crucial role in supporting

local economic development and growth across the country. As a key player in the banking and financial services sector, BDL recognizes the importance of maintaining a strong strategic intelligence function to navigate the complex and rapidly evolving business environment.

2.1. A brief History of BDL:

BDL boasts a rich and long history, tracing its roots back to its establishment on April 30, 1985, by the Democratic Republic of Algeria. The bank's creation was mandated through Decree No. 85-85, which outlined its purpose, operational framework, and core mission: to contribute substantially to the economic and social development of local communities across the nation. From its inception, BDL was tasked with a vital role in driving local economic growth and empowering communities throughout Algeria. The bank's mandate was to provide accessible financial services, credit facilities, and specialized support tailored to the unique needs of small businesses, entrepreneurs, and local development projects.

Over the years, BDL has remained steadfast in its commitment to fostering inclusive economic development at the grassroots level. The bank has continuously evolved its offerings, leveraging technological advancements and industry best practices to better serve its diverse clientele, ranging from individuals to small and medium-sized enterprises (SMEs).

Today, BDL stands as a pillar of the Algerian banking sector, with a nationwide network of branches that reached over 167, 8 Islamic branches ,125Mortgage loan agency and a proven track record of supporting local communities. Its legacy is deeply rooted in the principles of economic empowerment, financial inclusion, and sustainable development – principles that have guided the bank's strategic vision and operational philosophy since its establishment more than three decades ago.

2.2. Characteristics of the Local Development Bank

- A public bank that finances various economic operations.
- It finances the productive sectors to a large extent.
- It provides loans and facilities for production and transformation industries.
- It provides medium and long-term financing for small and medium projects.
- Granting consumer loans to people to purchase housing, cars, and various appliances.
- It is the only bank in the national frame that has pawn broking serveries

2.3. The mission of BDL:

The BDL's primary mission is to finance the needs of local monetary and financial development, fostering the growth of local economic activities through the provision of loans to public groups and bodies. Its financing activities encompass the following key areas :

- **Public Institutions and Enterprises:** BDL extends loans to public institutions and enterprises of an economic nature that operate under the guardianship of states and municipalities. This support enables these entities to contribute to local economic development.
- **Local Community Investment:** The bank actively finances planned productive investment operations initiated by local communities themselves, empowering them to pursue economic opportunities and drive sustainable development from within.
- **Mortgage Lending:** BDL plays a crucial role in facilitating home ownership and supporting the real estate market through its dedicated mortgage loan operations.
- **Private, Non-Agricultural Institutions:** Aligned with other commercial banks, BDL offers advances and loans to private, non-agricultural institutions. This financing enables eligible businesses to access capital for growth, expansion, and job creation.

Furthermore, BDL engages in the purchase and financing of public bonds issued by the state, local groups, or public bodies, contributing to the development of local financial markets. In providing these services, the bank operates according to the conditions and permitted forms outlined by regulatory authorities. Through its comprehensive suite of financing solutions tailored to the specific needs of local communities, businesses, and public entities, BDL remains steadfast in its mission to drive monetary and financial development at the grassroots level, fostering economic growth and empowering stakeholders across Algeria.

2.4. The Management Quality Direction (MQD):

To attend our field study, we opted the choice of the MQD department due to the following, in 18 April of 2019 there was a decision that overhaul the structure of BDL, in the decision that effected the MQD and changed its organigram to the following:

- There are 4 departments that exist in the department;
- Each department has 2 services to work on;
- Each department has 4 head-chef of departments;
- Each service has 8 chef of services.

This decision that was made by top management gave and defined the mission of the MQD and the mission of Strategic and Regulatory Environmental Monitoring.

2.4.1. Strategic and Regulatory Environmental Monitoring:

This department is structured into two services, especially:

- The Strategic Environmental Monitoring Service;
- The Regulatory Monitoring Service.

2.4.1.1. The strategic environmental monitoring service:

In our study we focused on its main missions which are:

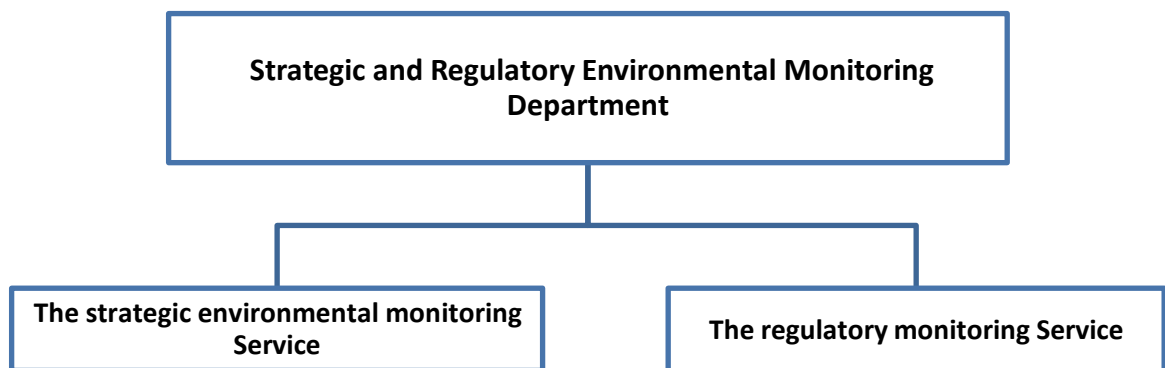
- Environmental scanning and monitoring the Constance changes that happens in the outside world and the surroundings of the bank.
- Competitive intelligence by collecting information about the competitors, their strategies and their services or products.
- Opportunity analysis by identifying and analyzing the emerging market opportunities, emerging trends, customer needs and potential areas of growth.
- Benchmarking by comparing and analysis the BDL performance against the business leaders and see what are the best practices available.

2.4.1.2The regulatory monitoring service:

In our study we observed how the regulatory of monitoring goes and how it affects the organization and as to related to our study we took the main points of its mission:

- Keeps the updated standards available to the bank to enhance the quality of products and services, and align the different activities of the bank in accordance to the guidelines contained;
- Regulatory monitoring always stays on any updates or changes in law, regulations, policies, and guidelines issued by relevant regulatory bodies and authorities such as central bank for example;
- Reporting and Documenting by sending and preparing reports on regular basis, updates documents and the point of it is to highlight points of concern, potential risk and recommend action to take.

Figure 6: shows the Strategic and Regulatory Environmental Monitoring structure



Source: Established by ourselves Based on inside documents provided by BDL

Conclusion:

In this chapter, we divided it into two sections. The first section handled the topic of our methodological frame that has been used in our study, we have used qualitative approach and used scientific tools to obtain results of our research. While in the second section was to presentation of the host organization. We started by introducing the host organization and giving a brief history of the company then its role, mission and the impact of it in the Algerian

economy. Then we introduced our departments that are the point of interest that were mainly MQD, Strategic and Regulatory Environmental Monitoring also showing the organigram and structure of each on.

In our next chapter we will be discussing the results of the research and see if the theories that were put earlier are correct.

Chapter III

Results and Discussions

Introduction:

in this section we will present the analysis of the results of the interview (**Annex B**) with the heads of the departments.

Section 1: Presentation and analysis of qualitative research results:

1. Results of the interview:

In this section we will present the results, it should be mentioned that the questions around the interview guide served us as a basis to us due to the chosen type of interview which was semi-structured interview.

Tableau 7:shows the interviewees order

The order of the interview	The department of interest
The first one	The chef of Strategic and Regulatory Environmental Monitoring Department
The second one	The director of the MDQ

The first interview:

The interview was inducted at the level of the strategic and regulatory environmental monitoring department, with the head chef of the department. After the small introduction and the general questions about the interviewee, we started to ask about the data analysis and collection:

- Can you describe the process of transforming the raw data and information collected into actionable strategic insights that are presented to the decision making in BDL?

- as the head of the department told us that he uses the simple way of collecting data from different sources then turned them into usable data by transforming them into data visualization and other forms.

-Also he mentioned the existence of a Decision Support System (DSS) named Cognitoce, and other was developed by BDL in 2019 named the NASRE.

-when I asked him about the Cognito system and the use of it, he mentioned it was a huge help yet it was not realized to its full potential due to they have each time add information or ask for one they have to wait to the DSS and the DSI to put it in manually.

- How does the strategic intelligence department ensure the timeliness, relevance, and reliability of the information provided to the executive team and board of directors?

He spoke about the treatment of the information and data in the same day of collecting it, and using weekly and daily notes that range from: rapports, monitoring notes and he noted also that their use of best practices to keep up to beat with the demand of the information to ensure the reliability and relevance of the data.

- In what ways do the decision-makers at BDL engage with the strategic intelligence department to define their information needs and provide feedback on the usefulness and impact of the intelligence provided?

After him, he mentioned that its necessary for each decision that the BDL makes from the top management down to the board of directors, and the feedback was key of their success to good obtained and well-studied decision although they can't force the decision directly he mentioned that they always use some type of communication within the top management when they need the data.

- To what extent are the directors and executives at BDL actively involved in shaping the strategic intelligence agenda and ensuring its alignment with the organization's overall strategic priorities?

When asked about it, the head chef of the department explained that they are the suppliers of information and also they have to respect the vision of the organizations based on the orders that the Top Management need to obtain their goals, so they basically they must have full alignment with the organization overall.

- Can you describe the processes in place to monitor the implementation and outcomes of strategic decisions made based on the intelligence provided by your department?

There isn't particular process in hand for monitor the implantation, and its main censoring points it's to get the information and data correct and fast as possible while insuring the quality for them.

The second interview:

The second interview was conducted at the level of MQD direction, with the director of the direction. After the small introduction and the general questions about the interviewee, we started with the interview that went as the following:

- Can you describe the process of transforming the raw data and information collected into actionable strategic insights that are presented to the decision making in BDL?

It's about the mission, the whole the process of transforming the raw data and information goes to the DSI department, that in hands put it into the DSS.

And why the reason that the DSI are in charge to putting the Data and information is that they can't use the DSS systems at their full potential.

Also the director mentioned the important role of the strategic monitoring department and how it play pivotal role in collecting data and transforming into useful information to use.

- In what ways do the decision-makers at BDL engage with the strategic intelligence department to define their information needs and provide feedback on the usefulness and impact of the intelligence provided?

As the decision-makers engage with the strategic intelligence almost on need and using defiant methods to obtain the information in need from giving orders, communications, demands and notes, and the feedback plays major role as its way to keep updated to the mission and understanding the need of the Top Management.

- Can you share examples of how strategic intelligence has informed and influenced key strategic decisions made by the leadership team at BDL (e.g., new product development, market expansion, risk mitigation)?

When I asked about an example of use that made huge difference, director mentioned that there is products that had to change that help to keep BDL competitive in the market, helping to stay comparative.

- To what extent are the directors and executives at BDL actively involved in shaping the strategic intelligence agenda and ensuring its alignment with the organization's overall strategic priorities?

As was told that the department that they must be aligned by the global vision and strategy and the Top Management have to insure the strategy and the departments to be affiliated with it.

- Can you describe the processes in place to monitor the implementation and outcomes of strategic decisions made based on the intelligence provided by your department?

There isn't a process in hand to follow all they have to insure is the collection and transformation of data to usable and consumable and make sure the quality of it.

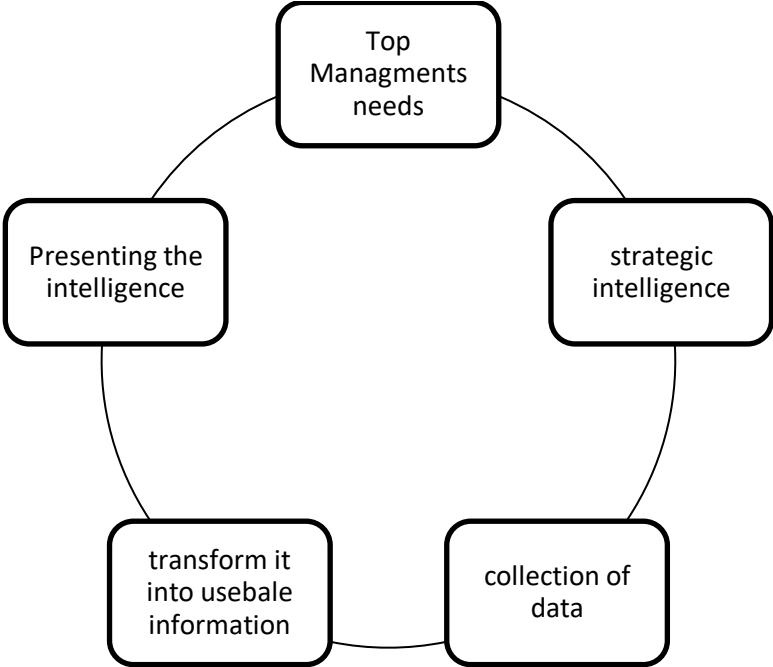
2. The summary of the interview:

The interview mainly focused on three main axes, the first being is to highlight the opinions of the head chefs of the departments on the usage of strategic intelligence on decision making and its impact on decision making from the policies to change of strategy itself.

Then thus we observed the following points:

- The Top Management uses strategic intelligence frequently to attend their objectives as fast and reliable as possible;
- There isn't a specific tools or techniques that they use in monitoring intelligences;
- The time of delivery the information is spot on and fast;
- The development of their own system of decision support and system of communication AL-NASR and Cognos;
- Constance feedback from the Top Management as a way to show the information collected is right for the situations;
- Although usage of Big Data is a necessity for them, they have some issues of using it due to the systems couldn't be aligned properly with the Data Warehouse correctly;
- Although in collections of Data they are hints of usage of Big Data there wasn't much to speak of;
- Constance researcher on update and sending weekly reports frequently.

Figure 7:shows the relationship between the Top Management and strategic intelligence department



Source: Established by ourselves

The main reason of the following figure is to show how the Top Management is always in need of strategic intelligence and such as, the strategic intelligence is always on the process of collecting information nonstop to satisfy their needs.

Section 2: exhibition and analysis of results of the qualitative research:

Our main objective of the research is to understand the role of strategic intelligence and its impact on decision making and how it effects it.

1.The contribution of strategic intelligence on the organization

The management of MQD that has the Strategic and Regulatory Environmental Monitoring Department, have somewhat of contributions in the BDL as an organization as whole, it’s up

to the Top Management to see the usefulness of the information presented by the Strategic and Regulatory Environmental Monitoring Department. Their for the contribution could go in two different ways either a huge influence, or little to non-influence and it's all up the decision makers, Top management or the situation that in hand. So to counter the little impact that the Strategic and Regulatory Environmental Monitoring Department could face the department send notes on daily, weekly or monthly, those notes have every update that happened on the world and can be point of interest for the organization, and the note can be wide range of reports, notes or data visualization.

1.1. The role of strategic intelligence in decision making:

The interview finding and after observations revealed varying prospective on the role of strategic intelligence in decision making process whiting the organization. While they acknowledge the significant input of strategic intelligence, yet the results yelled also that that its impact is ultimately determined by the decision-makers themselves.

On one hand the interviewees highlighted the vital role played by the strategic intelligence in facilitating informed decision making. They emphasize that the information that collected by the strategic intelligence departments helps the decision makers to understand, and have insight and give well informed decisions.

In the other hand the results exhibited that the strategic intelligence alone isn't enough to guaranty effective decision-making. Within the rustles it stresses that the finale verdict is up to the decision makers themselves.

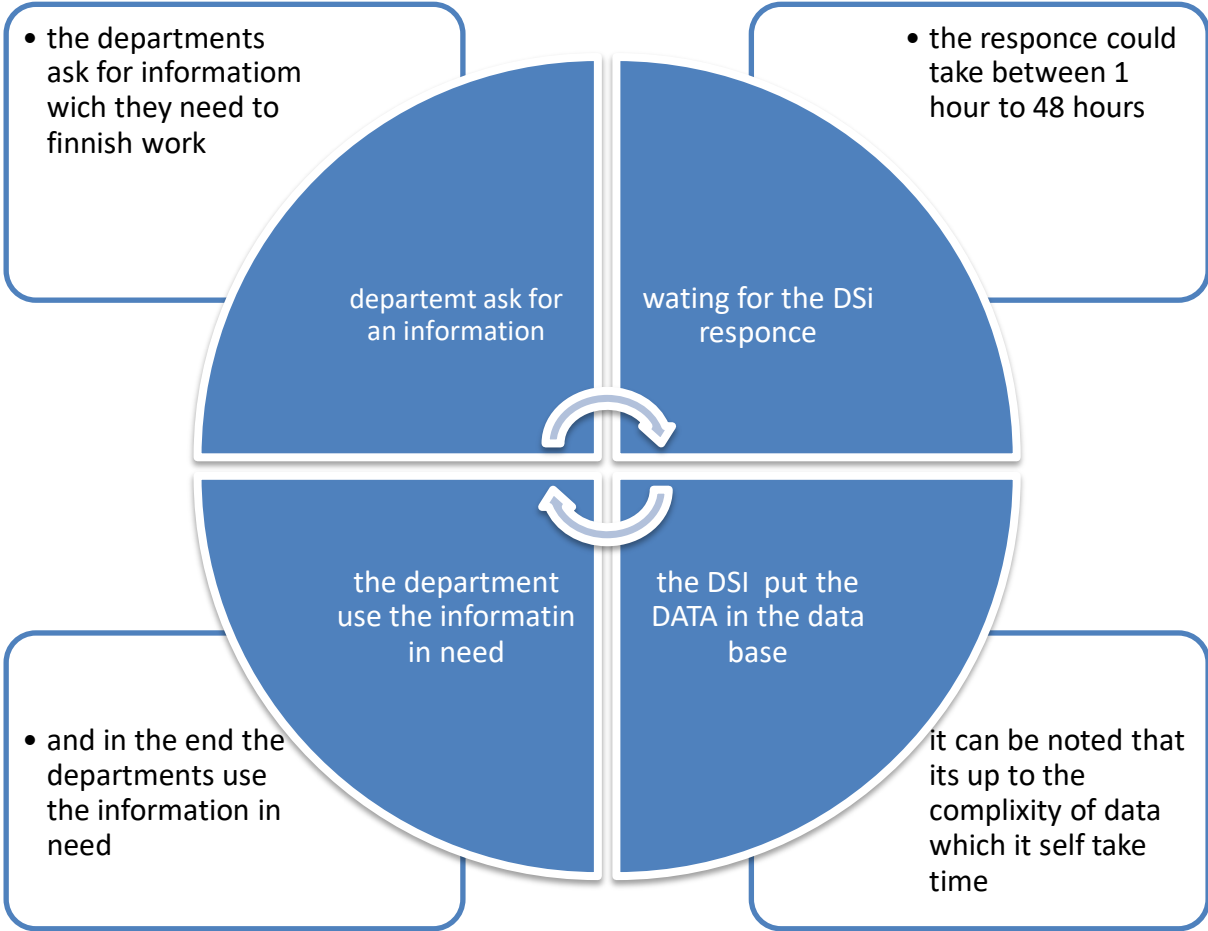
In addition, it was noted that the decision makers can depend on on different factors that can range from personal experience, intuition, external factors or DSS systems. This highlights the complexity of the decision-making process and the potential for strategic intelligence to be overshadowed by other considerations or biases.

1.2. The usage of DSS systems:

As it was invalid in the interview and from the observation that was made in place it was foretold that there is systems of supports decision or DSS, as key player for decision makers yet the aforementioned not used to its full potential from the problems of data-warehouses to the manual input of information by the DSI department, and when asked about it mostly was that their was a problems of usage of Big Data and the problems of time that the all departments if they need information they will have to put in advance a demand for the

information to be put on by the DSI or to obtain it and that can take between the same moment to 24 hours which gives some troubles that effects negatively the performance and not to keep with the Key Performance Area (KPA). And after all that there is uncertainty of the information although it wasn't highlighted in results yet it was mentioned casually in the limitation that they face on daily as an afterthought.

Figure 8 shows the process of adding Data in Data base



Source: Established by ourselves

1.3. The quality of the information:

As its stand that the information always been supreme with the needs of all the departments from the way they handle collection the information and the timeliness of the information, they respect the 3 main points of good and valid information from being fast, related and reliable. And after the interview and the observation that was done within the organization it can be said it plays a huge role as how it effects the decision makers in whole with positives inputs and feedback as the whole departments are kind of circular of information that is based on good communication which good and timely information is placed as the top priority.

2.The usage of technics and tools:

In the first part I spoke on the problems that the departments face with using advance tools for data mining and having some difficulties of using the full potential of Big Data. Even though the usage of data is mine concern to them as it a way to collect information, the problem is their isn't an obvious way, techniques or methods in use to be in full occupation.

2.1. The Data mining usage:

After the careful observations and the interview yelled the following rustle:

- It can be said that the whole departments are using the “Old School Methods” or the

classic methods as a way to data mining, it can be case made they are effective nevertheless although are effective and efficient they take time and put some stress and pressure which a way effect the quality of the information.

Figure 9: the use of traditional data mining

Key Insight	Supporting Evidence
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Continued reliance on traditional "old school" methods	"Our processes are quite traditional and haven't changed much over the years." - Dept. Head 1
Time-consuming nature of legacy approaches	"These methods, while tried-and-tested, can be time-consuming..." - Dept. Head 2
Analyste burnout impacting quality	"...and lead to analyst fatigue or burnout, which may impact the quality of intelligence produced." - Dept. Head 2
Challenges with efficiency and workload	"Continuing with legacy methods poses challenges in terms of efficiency, workload management..." - Summary
Difficulties keeping pace with data volumes and threats	"...amid increasing data volumes and evolving threats." - Summary
Majority still using traditional methods (Estimate)	Based on interviews, possibly 60-80% of analysts primarily use traditional approaches

Source Established by ourselves

2.2. The usage of The Intelligence Artificial in Strategic intelligence:

It was stated that it's a dream and wish to use IA in future operation although it wasn't mention in the interview as a result, yet it was mentioned by the head of the departments that it's a great step in the future if they could do it and integrated with the current systems, and when asked why it wasn't being devolved it was stated that there is some resistance with the idea of IA. And that it was kind of a risk that the organization not willing to take until develop their proper systems

2.3. The usage of BIG DATA:

Even thus it was mentioned heavily as core and key player as the strategic intelligence always in use it can be said that the lack of using the systems to their full potential effects heavily on how the information itself should be treated due to so called the "old schools methods" that became kind of obsolete which in hands effect negatively the timeliness, quality and the efficiency of the information obtained and treated which makes some type of problems in communication and satisfaction of the Top Management.

2.4. The challenges that the strategic intelligence faces:

Even if it has a large advantage on competitors in the interview that was conducted by the head chef and the director respectfully they both mentioned some challenges and problems that it can face and you can narrow the challenges and limitation in the following points:

- Information overload: “to much information kill the information” sometimes they face an overkill of information which make hard to distinguish between the important one and the noise;
- Human resources: by itself have to many problems from Attracting, retaining, and developing skilled analysts, linguists, and other specialized personnel required for complex intelligence operations to have decent numbers of personnel that are willing to do the work correctly;
- Access to channels: Even though the based job is to obtain information sometimes the DSI departments refuse to give access to some channels or web site fear of leaking sensitive information;
- Legal and Ethical Considerations: Ensuring intelligence activities comply with legal frameworks, civil liberties, and ethical standards, while still maintaining operational effectiveness.

Section 3: discussion

The main objective of our research was to gain a comprehensive understanding of the pivotal role strategic intelligence plays in decision-making processes. Through our meticulously designed interview guide, we defined and explored multiple critical elements and policies that exert a profound influence on both decision-making and strategic intelligence operations.

Speaking from a broader perspective, we are keenly aware that successful implementation of strategic intelligence in decision-making requires meticulous prior planning. This planning is essential to leverage strategic intelligence as a potent tool that can empower decision-makers by providing them with accurate, timely, and tailored information and data aligned with their specific requirements. Strategic intelligence plays a vital role in mitigating risks by facilitating the gathering and analysis of all available information pertaining to the current situation, as well as enabling the prediction of future scenarios. This predictive capability provides decision-makers with a valuable preview, allowing them to proactively prepare for potential dangers and risks that could negatively impact the organization. Moreover, strategic intelligence offers a plethora of additional services that can significantly enhance decision-making processes.

Firstly, to fully harness the potential of strategic intelligence, it is imperative to have a well-trained and dedicated team of professionals who possess the expertise and willingness to analyze, collect, and treat data objectively. Developing such a highly skilled team is a time-intensive endeavor, with the training period ranging from 6 to 12 months, encompassing critical areas such as subject matter expertise development, specialized skill acquisition, and operational training exercises. Continuous professional development and hands-on experience are crucial for maintaining the team's proficiency in this dynamic and ever-evolving field.

Secondly, strategic intelligence operations necessitate the implementation of cutting-edge systems capable of continuous monitoring and equipped with robust databases to effectively treat and utilize big data. Traditional systems often lack the capacity to handle the vast volume, velocity, and speed of information flow. Consequently, specialized systems designed to seamlessly process and manage large-scale data influxes are indispensable for strategic intelligence operations.

Furthermore, it is essential for the entire strategic intelligence department to maintain a constant pulse on the external environment, enabling them to gather the requisite information needed by decision-makers. This comprehensive awareness ensures that decision-makers have

access to timely and accurate data tailored to their specific situational needs, facilitating informed and effective decision-making.

Additionally, it is crucial to note that the Strategic Intelligence department must be closely aligned with the overarching vision and strategic objectives of the organization. This alignment is imperative because the organization's strategy itself is built upon specific views, priorities, and perspectives that the department needs to respect and adhere to in order to advance in lockstep with the directives and expectations of top management.

Decision-makers perceive strategic intelligence as a formidable tool in their arsenal, as previously mentioned. It serves as a multifaceted instrument to inform decision-making processes, mitigate risks, support strategic planning initiatives, and enable comprehensive environmental scanning. Furthermore, a significant advantage that strategic intelligence provides is the frequent generation of daily reports and analytical notes derived from a diverse array of sources, ranging from simple observations and surveys to in-depth benchmarking studies. This multifaceted approach can significantly enhance the quality and reliability of the intelligence product. However, the primary focus remains gaining a competitive edge and ensuring the organization's continued relevance within the market landscape. Strategic intelligence enables decision-makers to gauge competitor behaviors and dynamics, thereby facilitating the development of strategies that can be leveraged to the organization's advantage when executed judiciously.

As a decision-maker, one can consider and evaluate all reports and analytical notes provided by the strategic intelligence department. However, it is important to acknowledge that the decision-maker may choose to disregard or discount specific intelligence inputs for various reasons, such as perceived limitations in the quality of information, conflicting expert opinions within the current domain, or breakdowns in communication and coordination between departments.

Although decision-makers utilize the strategic intelligence department as a valuable tool, it is imperative to recognize the complementary role played by Decision Support Systems (DSS). These advanced mechanisms serve as potent decision-making aids that are readily available for decision-makers to leverage as needed, offering numerous advantages:

- Consolidated and updated data inputs, contributed not solely by the strategic intelligence department but also treated and enriched by other relevant departments within the organization;
- Access to a repository of past decisions and their associated outcomes, facilitating informed decision-making based on historical precedents and lessons learned;
- A collaborative platform for communicating and discussing complex decisions with subject matter experts, fostering knowledge-sharing and diverse perspectives;
- Flexibility and time-efficiency, empowering decision-makers to rapidly assess various scenarios and potential impacts, thereby accelerating the decision-making process.

Essentially, the strategic intelligence department and the pivotal role it plays within decision-making processes position it as a solid and continuous source of critical information. This information not only informs decision-makers but can also significantly influence and potentially shift the entire decision-making paradigm based on the breadth and depth of intelligence gathered. Strategic intelligence provides decision-makers with multiple alternative courses of action to consider, facilitating well-informed and holistic decision-making processes.

Conclusion

1.Overview and summary:

In this final thesis, we conduct an approach (qualitative approaches), in the objective of understanding strategic intelligence played in decision making and its impact of the letter, and

have been chosen Banque Development Local (BDL). And to do this research it was based on the following research question:

What is the importance of strategic intelligence in organizational decision-making? What role does it play in anticipating threats and opportunities? What are the challenges to optimally integrating it as a decision-making aid?

We summarize this dissertation as follows:

The introduction part gave an overview of the research problem and its context, it explains the important of the research, the objectives of the study, the question and the model of research in use and finally shows also the plan of study.

In the first chapter we divided into two main sectors, the first one handles the reviewed of literature it shows the best arterials that handled or spoke about the research that were track of handling , from **The Role of Strategic Intelligence Services in Corporate Decision Making and Affective reactions in management teams fast strategic decision-making under extreme time pressure to Information use in strategic decision making and Data over intuition' How big data analytics revolutionises the strategic decision-making processes in enterprise.** Which explained our two main variables that the research objectives based on. After that in sector 2 spoke about definitions, concepts and typologies from different authors and explication of the variables in use.

In chapter II showed the methodology in use also the collection and analysis of data in use. And after that it was the presentation of the host organization and host department that the study was took.

In chapter III it presented the research results that were obtained using the qualitative tools which were observation and interview with the head department and detractors respectfully also highlighted the main finding of the interview and main finding of observation which was in part spoke about in chapter III.

The conclusion, for its part, summarizes the main results obtained, and as well as the limits and its possible extensions.

2.The main rustles obtained:

The strategic intelligence department emerges as an indispensable asset in facilitating well informed and agile decision-making processes within organizations. Its pivotal role is

exemplified by its ability to provide decision-makers with accurate, timely, and meticulously tailored information that directly aligns with their specific requirements. However, realizing the full potential of strategic intelligence necessitates a structured and meticulous approach to implementation planning. This extensive groundwork lays the foundation for leveraging strategic intelligence as a potent tool capable of empowering decision-makers with invaluable insights derived from comprehensive data analysis.

Furthermore, strategic intelligence plays a vital role in mitigating risks by fostering an environment of proactive preparedness. This is achieved through the facilitation of a continuous cycle of gathering and analyzing all available information pertaining to current situational dynamics, coupled with the development of predictive models that enable decision-makers to anticipate future scenarios. This predictive capability equips decision-makers with a valuable preview, allowing them to proactively identify and address potential dangers and risks that could adversely impact the organization's operations and strategic objectives.

Notably, the value proposition of strategic intelligence extends far beyond risk mitigation. It serves as a multifaceted enabler that significantly enhances decision-making processes by supporting strategic planning initiatives, enabling comprehensive environmental scanning, and providing a competitive edge by monitoring and dissecting competitor behavior and market dynamics. This holistic approach empowers decision-makers with a profound understanding of the competitive landscape, industry trends, and emerging opportunities.

Underpinning the efficacy of strategic intelligence is the presence of a well-trained and dedicated team of professionals who possess the expertise and unwavering commitment to analyze, collect, and treat data with utmost objectivity. Developing such a highly skilled and proficient team is a time-intensive endeavor, with training periods ranging from 6 to 12 months, encompassing critical areas such as subject matter expertise development, specialized skill acquisition, and operational training exercises. Continuous professional development and hands-on experience are paramount to maintaining the team's proficiency in this dynamic and ever-evolving field, ensuring that they remain at the forefront of emerging trends and best practices.

Moreover, strategic intelligence operations necessitate the implementation of cutting-edge systems capable of continuous monitoring and equipped with robust databases to effectively treat and utilize big data. Traditional systems often lack the capacity to handle the vast

volume, velocity, and speed of information flow intrinsic to the modern data landscape. Consequently, specialized systems designed to seamlessly process and manage large-scale data influxes are indispensable for strategic intelligence operations, enabling the extraction of valuable insights from disparate and complex data sources.

While decision support systems (DSS) serve as complementary mechanisms that aid in decision-making, organizations face challenges in fully leveraging the potential of big data due to system integration issues. Overcoming these hurdles and fostering seamless interoperability between strategic intelligence systems and DSS is crucial to unlocking the synergistic benefits of these powerful tools.

Ultimately, the strategic intelligence department solidifies its position as a solid and continuous source of critical information that not only informs decision-makers but also possesses the capacity to significantly influence and potentially reshape the entire decision-making paradigm. The breadth and depth of intelligence gathered, coupled with rigorous analysis, empower decision-makers with multiple actionable alternatives, facilitating well-informed and holistic decision-making processes that drive organizational success in an increasingly complex and competitive business environment.

3. Limitation:

It was hard to find articles or information based on the case study, which in hand took lot of times to find articles relating of the research.

The small studying sample that in hand make it hard to get solid insight due to there is not enough samples to do full on through calculated research and results.

Lack of knowledge and understanding for some individualizes which it hand make it hard to find suitable samples to follow.

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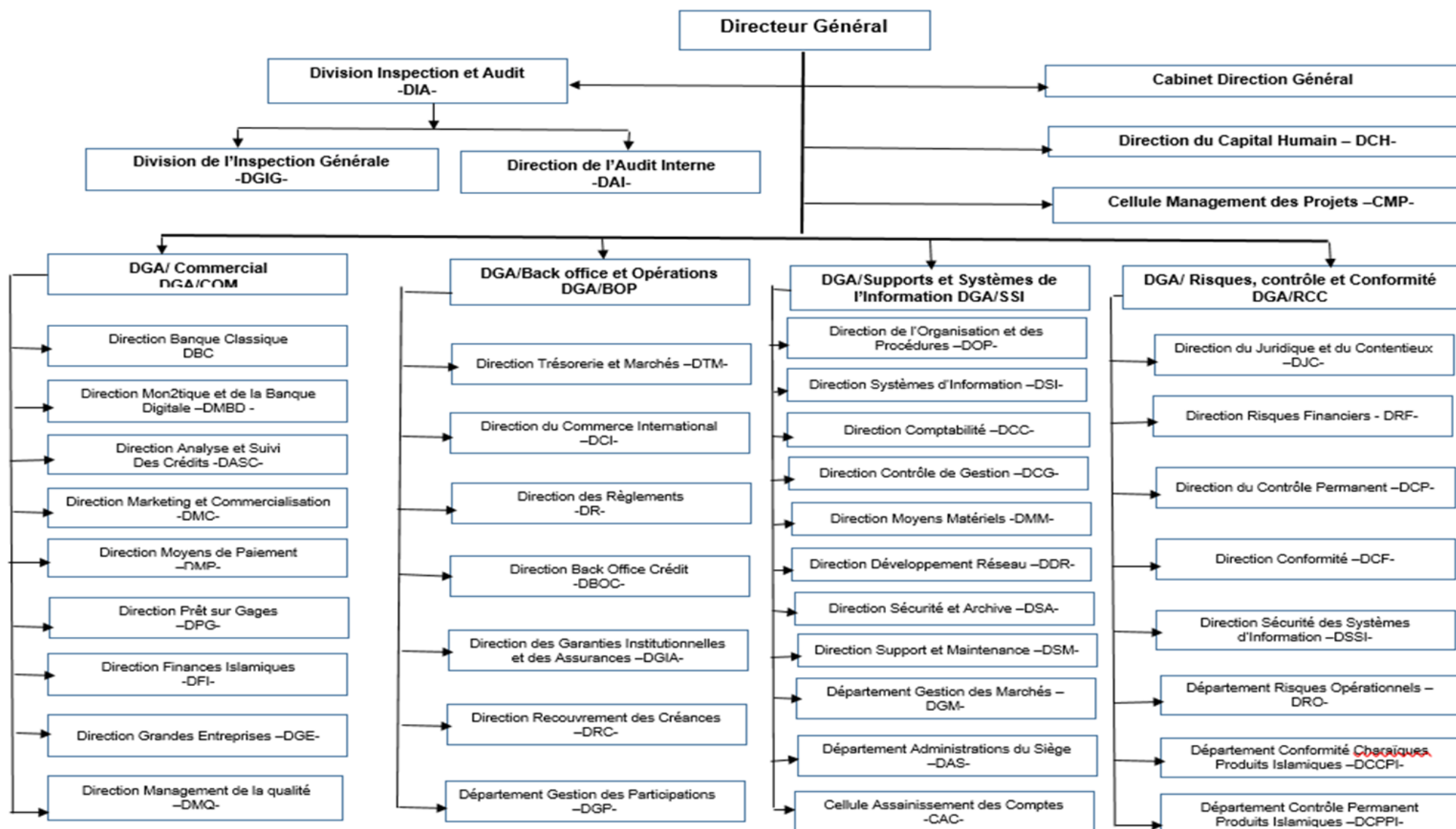
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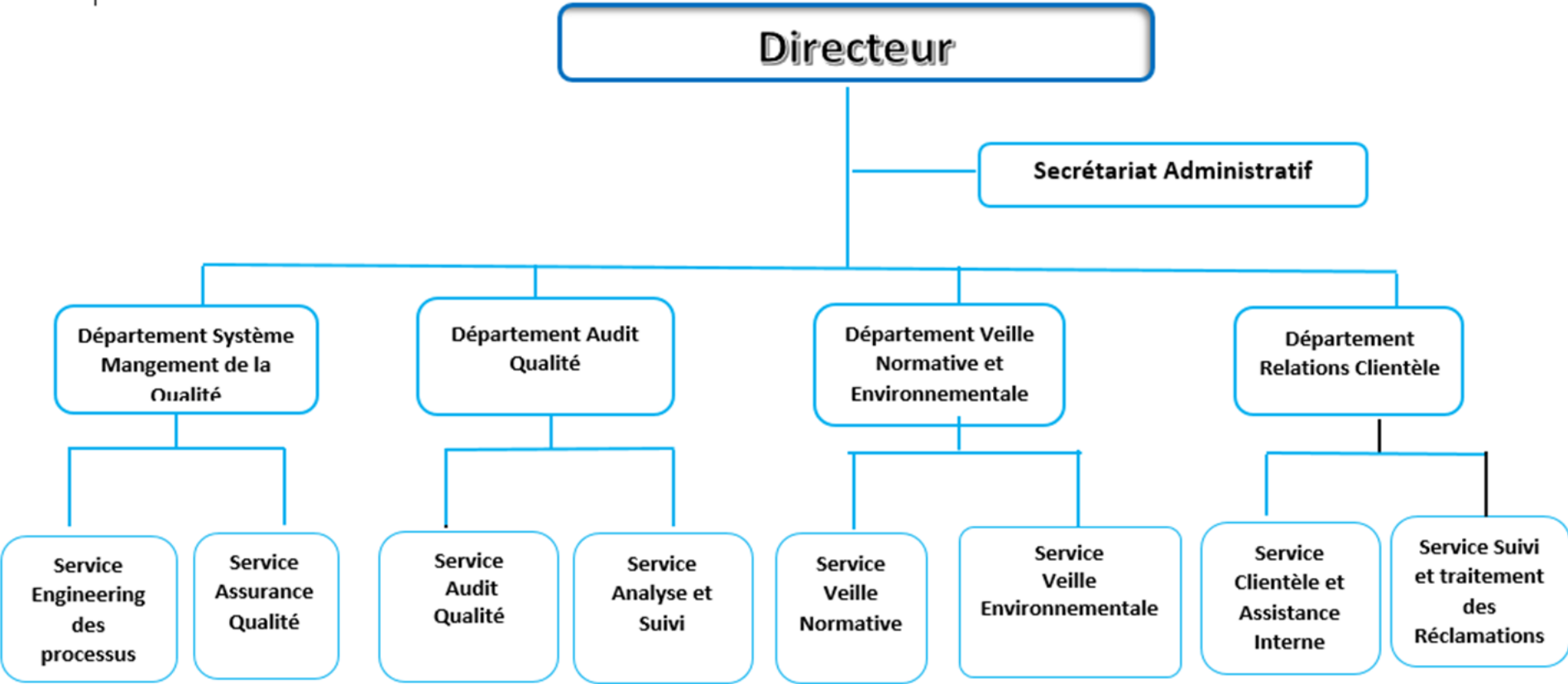
ANNEXES

ANNEX A: The overall structure of BDL

Organigramme de la Banque de Développement Local BDL (Décision DG N°24)



Organigramme de la Direction Management de la Qualité



ANNEX B : INTERVIEW GUIDED

Interview guide: << The impact of strategic intelligence on decision making process within The Management Quality Department (MQD), Strategic and Regulatory Environmental Monitoring BDL>>

Purpose and interest of the study:

Madam/Sir:

My name is Saadi Moncef, master 2 student of the specialty of Strategic Management and Information System at the ÉCOLE NATIONALE SUPÉRIEURE DE MANAGEMENT of Koléa. in the frame of participation of my final studies project, am doing a study titled The impact of strategic intelligence on decision making process within the MQD and Strategic and Regulatory Environmental Monitoring case of study BDL.

We would like to ask you to help us enrich our study by responding to this guide maintenance

This is intended for those responsible for the MQD and strategic intelligence, environment and standers. The objective of this interview is to respond to the objective of our study, namely the implementation of strategic intelligence, collecting the information, and decision making process.

Information about the interviewees

- Gender
- Age group
- Workstation
- Number of years of experience

General questions:

- Can you briefly describe the role of your department in managing information within BDL?

- How do you evaluate the collaboration between the MQD and Strategic and Regulatory Environmental Monitoring with other departments?
- What types of data sources and information channels does your strategic intelligence department utilize to stay informed about industry trends, competitive landscape, regulatory changes, and other factors that could impact BDL's operations?

Data collection and analysis:

- Can you describe the process of transforming the raw data and information collected into actionable strategic insights that are presented to the decision making in BDL.
- How does the strategic intelligence department ensure the timeliness, relevance, and reliability of the information provided to the executive team and board of directors?

Decision-Making Integrations:

- In what ways do the decision-makers at BDL engage with the strategic intelligence department to define their information needs and provide feedback on the usefulness and impact of the intelligence provided?
- Can you share examples of how strategic intelligence has informed and influenced key strategic decisions made by the leadership team at BDL (e.g., new product development, market expansion, risk mitigation)?

Challenges and improvements:

- What are some the limitations or challenges that your department faced in gathering, analyzing and disseminating strategic intelligence within the organization?
- How does the BDL strategic intelligence functions compare to the best practice, and what are the initiative are underway to continuously improve the department's capabilities and impact on decision making?

Organizational Alignment:

- To what extent are the directors and executives at BDL actively involved in shaping the strategic intelligence agenda and ensuring its alignment with the organization's overall strategic priorities?
- Can you describe the processes in place to monitor the implementation and outcomes of strategic decisions made based on the intelligence provided by your department?