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THE DESIGN AND IMPLEMENTATION OF THE BUSINESS ANALYTICS FRAMEWORK

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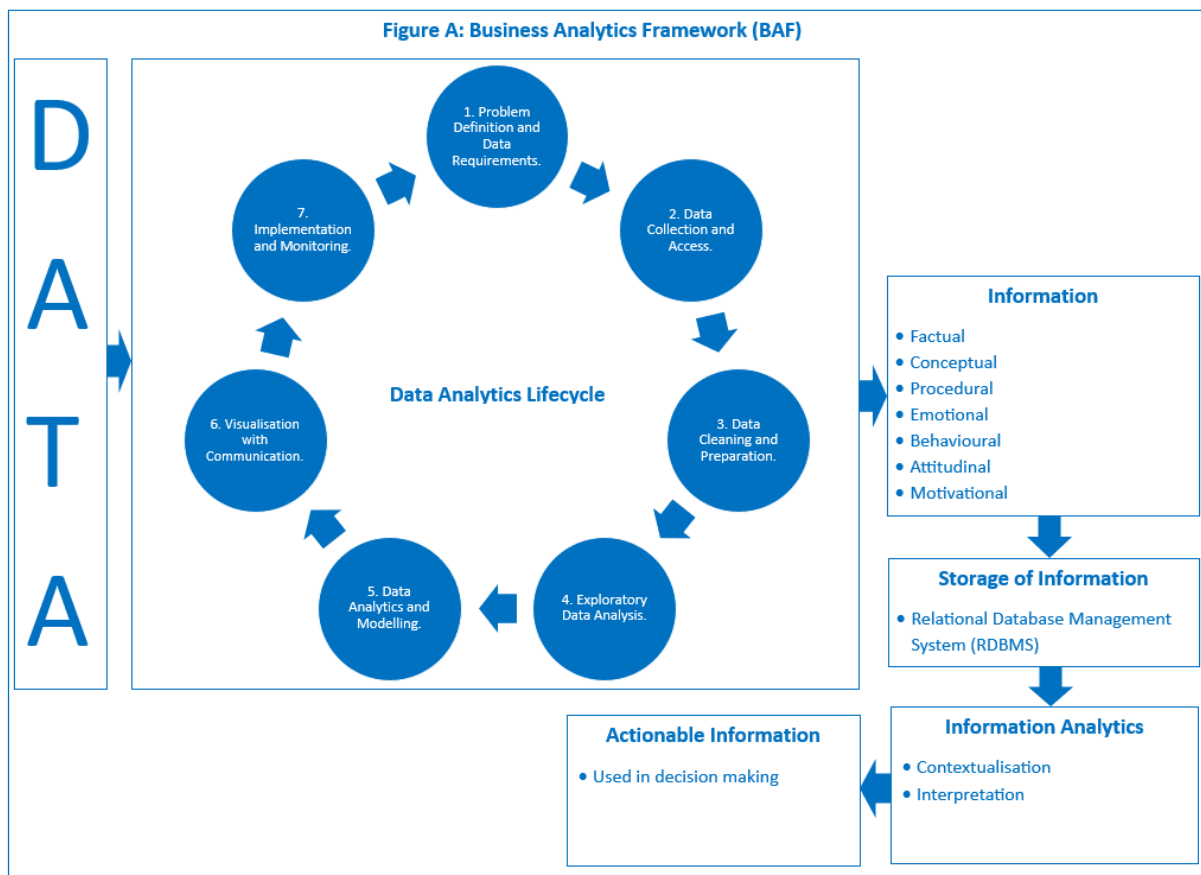
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ABSTRACT

The purpose of this paper is to analyse Data, Information, and Actionable Information. Data means raw facts and figures. Data is meaningless unless it is processed into Information. When Data is processed through Data Analytics which consists of several stages, we obtain Information. Data is one thing and Information is another thing. Unfortunately, Data is being used interchangeably with Information by the vast majority of so-called PhD holders and Professors of the Academia. This is a sad reality and the whole Academic Literature on Data Analytics is erroneous! When Information is contextualized and interpreted through Information Analytics, we obtain Actionable Information. Information is one thing and Actionable Information is another thing. Actionable Information is used in decision making. Now, the combination of Data Analytics and Information Analytics is known as Business Analytics. Once again, the definition of Business Analytics in the Academic Literature is erroneous! PhD holders and Professors of the Academia are using the term Business Analytics interchangeably with Data Analytics and Information Analytics. This is evidence of poor scholarship. For that reason, this paper will not rely on the Academic Literature which leaves much to be desired, but rather concentrate on practical and factual methodologies such as Data Analytics Lifecycle, Categories of Information, Storage of Information, Information Analytics, and Actionable Information.

Keywords: Data, Information, Data Analytics, Information Analytics, Business Analytics, Actionable Information

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1. Data Analytics Lifecycle¹

The Data Analytics Lifecycle represents the end-to-end process of working with Data to extract actionable insights. Different organisations may use slightly different terminology or combine certain phases in an end-to-end Data project. The core components of the life cycle of Data Analytics typically include:

1. Problem Definition and Data Requirements
2. Data Collection and Access

¹ <https://www.quadratichq.com/blog/understanding-the-Data-analytics-lifecycle-from-end-to-end>

3. Data Cleaning and Preparation
4. Exploratory Data Analysis
5. [Data] Analytics and Modeling
6. Visualisation with Communication
7. Implementation and Monitoring

The Business Analytics Framework diagram (Figure A) illustrates how each phase in the Data Analytics Lifecycle builds upon the previous one, in practice, however, the process is often iterative rather than strictly linear. The Data Analytics Lifecycle diagram below shows the cyclical nature of this process because insights often lead to new questions. The life cycle needs to be carefully analysed when introducing any type of AI into any of the seven phases.

In this visualization, the outer circles represent the six primary phases of the Data Analytics Lifecycle arranged in a clockwise sequence. Although the life cycle is drawn as an iterative linear process, any phase can feed back into a previous phase and cause change. The double-headed dashed arrows connect each outer phase to the central "Implementation & Monitoring" hub (Phase 7), illustrating that (a) each phase can directly inform or be affected by implementation decisions, and (b) implementation results can trigger work or rework in any of the other phases.

This hub-and-spoke model more accurately represents how Data Analytics works in practice.

- Insights from any phase might necessitate immediate implementation.
- Implementation and monitoring often reveal needs that require jumping directly to specific phases.
- The process is highly iterative rather than strictly sequential.

The central positioning of Implementation and Monitoring emphasizes its role as both a destination for insights and another origin point for new questions and analytical needs. This creates a dynamic ecosystem where Data-driven decisions and their outcomes continuously inform each other.

While this specific presentation is original, the general framework of the Data Analytics Lifecycle is established industry knowledge. This visualization better captures the reality of modern Data Analytics workflows, where teams frequently move between phases based on findings, business needs, and implementation results, and where AI may be introduced into any or all of the life-cycle phases.

The seven phases of the Data Analytics Lifecycle

Let's explore each of the Data Analytics Lifecycle phases in detail.

Phase 1: Problem definition and Data requirements

Every effective Analytics project begins with a clear definition of the business problem or opportunity. This critical first step in the analysis Lifecycle ensures that subsequent analysis will deliver relevant, valuable insights rather than merely interesting but ultimately unusable Information.

Strong problem definitions are:

- Specific and focused on a particular challenge or opportunity
- Aligned with broader organisational goals and strategies
- Measurable, with clear criteria for success
- Actionable, leading to potential decisions or intervention

For example, rather than a vague goal like "understand customer behavior," a well-defined problem might be "identify factors contributing to customer churn in our premium subscription tier to develop targeted retention strategies."

Once the business question is clear, the next step in this phase involves identifying what Data is needed. This includes:

- Types of Data required (demographic, transactional, behavioral, etc.)
- Level of granularity needed (individual, aggregate, etc.)
- Time period of interest (historical depth, frequency of updates)
- Internal and external Data sources to be consulted

This phase also involves a preliminary assessment of Data availability and accessibility. Are the necessary Datasets already available within the organisation? Will external Data need to be acquired? Are there legal or compliance considerations that could limit Data usage?

By investing time upfront in a clear problem definition and requirements, organisations can avoid the common pitfall of collecting massive amounts of Data without a clear purpose. Having no clear purpose often leads to "analysis paralysis" or insights that do not address key business needs.

Phase 2: Data collection and access

With requirements defined, the next phase focuses on identifying and accessing Data sources. The access mechanism(s) must be established for each source. Common Data sources include:

- Internal operational systems (CRM, ERP, marketing automation)
- Data warehouses and Data lakes
- External Datasets (market research, public Datasets, third-party providers)
- Web and social media platforms

- IoT devices and sensors
- Survey and research Data

Accessing this Data often requires collaboration with IT teams, Data engineers, or external providers. Technical considerations include:

- Database connections and query methods
- API access and integration
- File formats and transfer mechanisms
- Authentication and authorization protocols
- Data governance and compliance requirements

Notice that Storage is not listed in the seven phases or on the diagram because Data may be transformed either before or after it is loaded into the storage destination. This is often discussed as choosing between an ETL (Extract, Transform, Load) process and an ELT (Extract, Load, Transform) process. For either, loading Data into its storage destination may involve:

- Batch processing of historical Data
- Setting up streaming pipelines for real-time Data
- Creating appropriate storage structures (Databases, Data lakes, etc.)
- Establishing Data catalogs to track available Datasets
- Implementing metaData management to document Data characteristics

The collection phase often reveals gaps between ideal Data requirements and what is actually available. This may necessitate adjusting expectations, finding proxy measures, or initiating new Data collection efforts to address critical gaps.

Phase 3: Data cleaning and preparation

Data rarely arrives in an analysis-ready state, and the importance of Data cleaning is often undervalued. Raw Data typically contains errors, inconsistencies, and structural issues that must be addressed before meaningful analysis can begin. This Data cleaning phase is often the most time-consuming part of the Data Analytics Lifecycle, with practitioners reporting that it can consume large blocks of their total project time.

Common Data quality issues include:

- Missing values: Gaps in the Data that must be addressed through deletion, imputation, or flagging
- Duplicate records: Redundant entries that can skew analyses and waste computational resources

- Inconsistent formatting: Variations in how dates, currencies, or categorical values are represented
- Outliers and errors: Values that fall outside expected ranges or contain obvious mistakes
- Structural problems: Issues with how Data is organized that complicate analysis

Despite being labor-intensive, thorough Data cleaning is essential for reliable results. As the saying goes: "garbage in, garbage out." Even the most sophisticated analytical techniques cannot compensate for poor-quality input Data.

Beyond cleaning, raw Data typically requires transformation to create analysis-ready Datasets. This may involve:

- Standardizing formats and units across different Data sources
- Normalizing or scaling numerical variables
- Encoding categorical variables for mathematical analysis
- Creating derived variables that better capture phenomena of interest
- Aggregating or summarizing Data tables to appropriate levels
- Restructuring Data between wide and long formats

Many analytical projects require combining multiple Data sources to create a comprehensive view. This integration process may involve:

- Identifying common keys or matching criteria across Datasets
- Resolving entity resolution challenges (e.g., determining when records from different systems represent the same customer)
- Handling conflicting Information from different sources
- Establishing temporal alignment between Datasets collected at different times

External Data enrichment may also add valuable context to internal Datasets. For example, augmenting customer Data with demographic Information, or adding geographic Data to retail locations.

Phase 4: Exploratory Data analysis (EDA)

Once Data is cleaned and prepared, exploratory Data analysis (EDA) provides the first opportunity to understand what the Data reveals. This critical phase helps analysts:

- Understand the distribution and characteristics of key variables
- Identify relationships and correlations between variables
- Discover patterns, trends, and anomalies
- Generate initial hypotheses for deeper investigation
- Validate assumptions about the Data

EDA combines visual and statistical techniques to develop a comprehensive understanding of the Dataset. Simple summary statistics such as means, medians, and standard deviations provide a starting point, while Data visualizations reveal patterns that numbers alone might miss. Effective exploratory analysis typically employs multiple techniques:

- Univariate analysis examines individual variables through histograms, box plots, and summary statistics.
- Bivariate analysis explores relationships between pairs of variables through scatter plots, correlation coefficients, and contingency tables.
- Multivariate analysis investigates interactions among multiple variables simultaneously.
- Temporal analysis identifies trends, seasonality, and patterns over time.
- Geographic analysis reveals spatial patterns and relationships.

Throughout the EDA phase, the goal is not just to understand what the Data contains, but to develop insights relevant to the original business question. Strong EDA maintains the connection between technical exploration and business context.

Phase 5: [Data Analytics] and Modeling

The Data Analytics and Modeling phase includes selecting the appropriate analytical techniques, developing and validating (or choosing) the model, and then interpreting and evaluating the model's results in the context of the original question to be answered or the problem to be solved.

Based on the business question and insights from exploratory analysis, analysts select appropriate advanced analytical techniques. These broadly fall into 5 categories:

- **Descriptive Analytics** summarizes what has happened through aggregations, segmentation, and summarization.
- **Diagnostic Analytics** examines why something happened through correlation analysis, factor analysis, and root cause investigation.
- **Predictive Analytics** forecasts what might happen through regression, classification, time series, and machine learning approaches.
- **Prescriptive Analytics** recommends actions through optimization, simulation, and decision analysis.

The choice of specific techniques depends on:

- The nature of the business question
- Characteristics of the available Data
- Required level of statistical confidence
- Available analytical tools and expertise

- Interpretability requirements for stakeholders

For predictive and prescriptive approaches, model development follows a structured process:

- Feature selection: Identifying the most relevant variables for inclusion
- Algorithm selection: Choosing appropriate modeling techniques
- Model training: Using a portion of Data to develop initial models
- Hyperparameter tuning: Optimizing model parameters for performance
- Validation: Testing models on held-out Data to assess generalizability
- Ensemble methods: Combining multiple models for improved performance

Model validation is particularly important to ensure that results will generalize beyond the specific Dataset used for training. Cross-validation techniques, testing on independent Datasets, and monitoring for model drift over time help ensure reliable results.

When a model is developed, its results must be interpreted in the context of the original business question. This involves:

- Assessing statistical significance and confidence levels
- Evaluating practical significance and business impact
- Understanding model limitations and constraints
- Identifying potential biases or ethical considerations
- Considering alternative explanations for observed patterns

The goal is to produce accurate models that extract meaningful insights that inform decision-making. Technical performance metrics (accuracy, precision, recall) matter, but business relevance remains the ultimate criterion for success.

- **AI Analytics** is a form of Data Analytics that leverages artificial intelligence – in particular, advanced forms of machine learning – for business intelligence purposes.

Use of AI Analytics²

Although it is meaningfully distinct from the Traditional Data analysis methods used by many organisations, AI Analytics is focused on achieving the same end: analysing Data sets to produce actionable insights and guide Data-driven decisions. AI is rapidly changing the available tools, and Gartner predicts that by 2027, “AI assistants and AI-enhanced workflows

² AI in Analytics: Examples, Benefits, and Real-World Use Cases | Coursera: AI in Analytics: Examples, Benefits, and Real-World Use Cases

incorporated into Data integration tools will reduce manual intervention by 60% and enable self-service Data management.”

The core difference between AI Analytics and Traditional Data Analytics lies in *the kinds* of technology used to create and access these insights. Today, many organisations rely on Traditional business intelligence (BI) tools like dashboards to synthesize and display Data points for easy reference when making decisions. Yet, while these tools are impactful, they often provide a static view of the Data for most users, lean heavily on statistical analysis to generate insights, and require analysts to draw conclusions themselves rather than rely on the technology.

AI Analytics uses advanced AI methods, such as natural language processing (NLP) and deep learning, to analyse large Data sets, develop insights, and guide decision-making in a dynamic manner that responds directly to user interactions. For example, an AI-enabled Analytics platform could allow business users to directly ask questions like “What was our sales performance last quarter?” and “What is the average number of sales made during the Q4 holiday season over the last three years?” In response, the system would be able to answer these queries dynamically without requiring human intervention.

AI Analytics, then, is simply about applying the latest commercial developments in AI to the practice of Data analysis already established within many organisations.

The uses of AI in Data Analytics are vast, diverse, and continually evolving as the field of artificial intelligence advances. Nonetheless, there are some uses of AI that are becoming increasingly prevalent in the business world that managers and organisational leaders should know about. Below, we explore three of these uses.

1. Democratize Data

To make efficient, Data-driven decisions, business professionals need access to relevant Data points and insights as soon as their need arises. Despite this fact, many professionals within organisations lack the technical skills required to effectively work with Data and get the answers they need out of it.

Fortunately, AI Analytics tools can help democratize Data within the workplace with interactive interfaces that allow users to simply query the platform itself. Rather than having to sift through the backend, then, generative AI tools like chatbots can answer users’ questions directly so that they can get the insights they need, when they need them.

2. Efficiently analyse big Data sets

Many organisations are awash in Data. Yet, rather than helping workers make the best decisions, many professionals instead find the sheer volume of Data at their fingertips hinders their decision-making rather than helps it.

According to a 2023 study by Oracle, for example, 72 percent of surveyed workers said that the volume of Data and their lack of trust in it had stopped them from making decisions [1]. To make matters worse, 89 percent of respondents admitted that they believed the expanding number of Data sources in their workplaces had actually limited their organisations' success rather than helped it.

AI can help remedy the Data overwhelm many workers' experiences by quickly and efficiently analysing the large amounts of Data organisations are currently struggling with. In effect, workers can feel confident that the Information in front of them is both reliable and up-to-date, empowering them to make strong decisions when the time calls for it.

3. Automate Data management

Some of the most tedious, time-consuming tasks in Data analysis are also the most foundational: extracting, cleaning, and entering Data into Databases are all necessary steps to complete before effective analysis can occur. As a result, many Data professionals spend much of their time accomplishing these necessary steps rather than focusing on the most complex and impactful aspects of their work.

Thankfully, AI is well-suited to Data management tasks such as Data cleaning, entry, and classification and can do them automatically without human input. Furthermore, AI can detect anomalies and errors in Data sets and resolve these issues to ensure a Database's integrity, so Data professionals can have confidence in their results and insights.

Benefits of AI Analytics

There are many benefits to using AI for Data Analytics. Some of the most common that organisations may experience include:

- **Improve decision-making:** AI Analytics has the power to democratize Data, so business professionals without a background in Data Analytics can gain insights when needed. In turn, it has the power to improve decision-making for a wider number of workers than many of those BI solutions in use today.
- **Increase productivity:** AI tools can perform tedious Data analysis tasks that take a significant amount of time for Data professionals to complete. Free from these tasks, Data scientists and analysts can focus on the most complex and impactful projects for their employers.

- **Greater predictive accuracy:** As AI advances, so does its capabilities. In particular, deep learning and machine learning models have the ability to more accurately predict outcomes than many of the predictive techniques business professionals used in the past.
- **Dynamic and personalized interfaces:** BI dashboards are a common tool used by business professionals every day. But, while many Traditional dashboards have only limited interactive features, AI-enabled ones have the potential to respond dynamically to users and provide them with a personalized view so they can do their best work.

AI Analytics example

There are many ways businesses can implement AI Analytics into their existing workflows. For some organisations, in fact, it's actually core to their brand and business model.

Netflix, for example, uses machine learning to provide customers with personalized recommendations to encourage them to stay on the platform. Not satisfied with just using AI to create an engaging customer experience, the company also uses it to design its movie catalog, identify the characteristics of successful content, and inform its advertising spend, among other things.

As AI becomes more user-friendly, it's safe to assume that many of the techniques that made companies like Netflix successful will become more prevalent in medium-sized and small businesses too.

AI Analytics tools

Now that you have a better understanding of AI Analytics, it's time to start exploring the tools that can help you implement it in your own organisation. Some common AI Analytics tools you might consider exploring include:

- ChatGPT
- Tableau AI and Tableau Pulse
- Power BI with AI Insights
- IBM Cognos Analytics
- Jupyter AI

Phase 6: Visualization with communication

Effective communication of analytical results requires translating complex findings into formats that stakeholders can easily understand and act upon, typically referred to as last-mile Analytics. Data visualization plays a crucial role in this translation, and the choice of type of visualization depends heavily on the nature of the Data and the key message.

Beyond individual visualizations, effective communication often requires building a coherent Data story that:

- Establishes relevant context for the analysis
- Guides audiences logically through key findings
- Connects analytical results to business implications
- Addresses potential questions or objections
- Leads naturally to recommended actions

Interactive dashboards increasingly complement static reports, allowing stakeholders to explore Data dynamically and focus on aspects most relevant to their specific needs with self-serve Analytics. These tools provide multiple levels of detail, from high-level summaries to granular exploration. Different stakeholders have different needs and technical backgrounds. Consequently, effective communicators adjust their language, level of detail, and visualization complexity based on audience needs, ensuring that insights are not just presented but understood and applied.

Phase 7: Implementation and Monitoring

The implementation phase often requires connecting analytical teams with operational units that will apply the insights in practice. The ultimate value of Analytics comes from the actions they enable that produce valuable results. Implementing analytical results involves:

- Translating insights into specific action plans
- Integrating findings into business processes and decision-making
- Developing implementation timelines and responsibility assignments
- Creating procedures to track the impact of Data-driven changes
- Establishing feedback mechanisms to refine approaches based on results

Implementing an actionable insight is rarely a one-time event. When insights have been implemented, ongoing monitoring helps:

- Track the impact of changes made based on analytical findings
- Identify when models or insights need to be updated due to changing conditions
- Discover new questions that emerge from initial results
- Refine methodologies based on observed outcomes

This monitoring creates a feedback loop, potentially initiating new iterations of the Data analysis life cycle. Changes will cause business questions to evolve and new Data to become available.

Organisations typically encounter several challenges when implementing the Data Analytics life cycle:

- *Data silos and accessibility issues*: Critical Data may be scattered across systems or departments with limited integration.
- *Data quality and governance concerns*: Inconsistent standards for Data collection and management can undermine analytical efforts.
- *Skill gaps and resource constraints*: Organisations may lack the specialized skills needed for advanced Analytics.
- *Change management hurdles*: Transitioning to Data-driven decision-making often requires cultural and process changes.
- *Balancing speed and rigor*: Pressure for quick insights must be balanced with methodological thoroughness.

Incorporating several best practices into the various Data analysis life cycle phases can decrease or eliminate some of the challenges:

- *Maintain business alignment*: Keep the original business question at the center of all analytical activities.
- *Embrace iteration*: Recognize that Analytics is rarely linear, with insights at one stage often requiring revisiting earlier phases.
- *Document extensively*: Record assumptions, methodologies, and decisions throughout the process for transparency and reproducibility.
- *Foster collaboration*: Build cross-functional teams that combine domain expertise with technical skills.
- *Invest in infrastructure*: Develop a solid Data infrastructure and Analytics strategy that enables efficient Data access, processing, and sharing.
- *Focus on adoption*: Actively work to ensure insights are understood, trusted, and utilized by decision-makers.
- *Prioritize ethical considerations*: Address privacy, fairness, and potential biases throughout the Analytics process.

The introduction of AI tools for Data analysis can also decrease some of the challenges. For example, using LLMs for Data analysis with Quadratic eliminates much of the hassle in Data cleaning and preparation. It currently integrates natively with 4 Databases and Data warehouses as well as APIs for real-time updates, and integrated connections can be requested for other sources.

AI capabilities augment human analysts rather than replace them. The analysts can then focus on higher-value activities requiring judgment and domain expertise. Also, Analytics capabilities are expanding to non-specialists because AI for business intelligence provides a

natural language interface. For example, Quadratic AI's natural language interface allows non-technical stakeholders to engage directly with Data.

From Data to Information

The Data Analytics Lifecycle provides a structured framework for transforming raw Data into [Information]. Processes in the phases from problem definition through Data collection, preparation, analysis, and communication to implementation can be made more effective and avoid common pitfalls.

However, successful Data Analytics Lifecycle management requires a thoughtful combination of business context, technical expertise, and communication skills. The most successful Business Analytics from Data to insights initiatives recognize that the Lifecycle is not just a technical process but a socio-technical one, requiring alignment between people, processes, and technology.

The [Data Analytics Lifecycle] provides a comprehensive framework for Data Analytics end-to-end project planning and execution. In a world where Data volumes continue to grow exponentially, making the Analytics life cycle more efficient and effective represents a crucial advantage that separates Data-driven leaders from their competitors.

Categories of Information³

The seven types of Information that are generated from the Data Analytics Lifecycle are: factual, conceptual, procedural, emotional, behavioral, attitudinal, and motivational. In general, organisations should manage different types of Information in a way that is consistent with their overall organisational goals and objectives.

However, there may be some specific types of Information that require special consideration or management. For example, confidential or sensitive Information should be managed in a way that protects its security and privacy.

Types of Information to Deal With

Organisations must be able to recognize the many kinds of Information they typically deal with and have a comprehensive plan in place for storing, securing, distributing, and retaining them.

The types of Information include:

1- Factual

³ <https://theecmconsultant.com/types-of-Information/>

Factual Information is Information that can be proven to be true. It can be verified by looking at evidence or using a scientific method. Facts are also referred to as “verifiable facts” or “Data.”

Organisations can benefit from factual Information by using it to make informed decisions. Factual Information can help organisations understand their customers, learn about new market trends, and make better decisions about product development, pricing, and marketing. Additionally, factual Information can help organisations improve their operations and reduce costs.

Examples of factual Information include:

- The number of products a company produces.
- The number of employees a company has.
- The locations of a company’s offices or factories.
- The names of a company’s products.
- The dates when a company was founded or when products were launched.

Among the different types of Information, Factual Information is considered the most important one.

2- Conceptual

Conceptual Information refers to the mental models and mental representations that people use to understand the world around them. This includes both the knowledge that people have about the world and the way that they think about that knowledge.

It is important to note that conceptual Information is not just factual knowledge, but also includes people’s beliefs, values, and assumptions about the world.

Conceptual Information can help organisations to develop a better understanding of their customers, to improve their communication with customers, and to develop more effective marketing strategies. Additionally, conceptual Information can also help organisations to improve their internal communication and to better align their activities with their strategic goals.

Examples of conceptual Information include:

- The mission, vision, and values of the organisation
- The organisational structure
- The strategies and goals of the organisation
- The culture of the organisation
- The history of the organisation

Conceptual Information is another type of Information that should be properly controlled within organisations.

3- Procedural

Procedural Information is a type of Information that provides a step-by-step guide on how to do something. It can be presented in a number of different formats, including written instructions, diagrams, and videos.

Organisations can benefit from procedural Information by using it to streamline their processes and improve their efficiency. By understanding and following the procedures laid out in this type of Information, organisations can avoid costly mistakes and save time.

Additionally, procedural Information can help organisations to train new employees more effectively, ensuring that they are able to hit the ground running and avoid any costly errors.

Examples of procedural Information include:

- The name, address, and telephone number of the organisation
- The hours of operation of the organisation
- A description of the services offered by the organisation
- The eligibility requirements for receiving services from the organisation
- The process for applying for services from the organisation
- The geographical areas served by the organisation
- The languages spoken by staff at the organisation
- The payment methods accepted by the organisation

Among the different types of Information, Procedural Information is needed to regulate and control how different operations are executed within organisations.

4- Emotional

Emotional Information is any type of Information that can provoke an emotional reaction in a person. This can include anything from words and phrases to images and videos. Emotional Information can be positive or negative, and it can be used to influence a person's mood and behavior.

Organisations can benefit from emotional Information by using it to better understand their customers and employees. This can help them to improve customer satisfaction and employee engagement. Additionally, emotional Information can be used to create more effective marketing and sales campaigns.

Examples of emotional Information include:

- Employees who feel supported by their organisation are more likely to be engaged and productive.
- Employees who feel like they are part of a supportive and positive work environment are more likely to be satisfied with their job.
- A positive work environment can lead to increased creativity and innovation.
- When employees feel like their work is meaningful and they are supported by their organisation, they are more likely to be committed to their job.
- A positive work environment can help reduce stress levels and promote a healthy work-life balance.

Among the different types of Information, emotional Information can play a very important role to understand how customers feel about your brand and take decisions to improve it.

5- Behavioural

Behavioural Information is defined as Data that captures how individuals interact with technology. This can include Data such as website clicks, app usage, and social media interactions.

Organisations can benefit from behavioral Information by using it to assess employee satisfaction, identify training and development needs, and improve communication and workplace relationships. Additionally, behavioral Information can be used to create a more positive work environment, improve customer service, and increase sales and profits.

Examples of behavioral Information in organisations include:

- Employee performance Data
- Customer satisfaction ratings, and safety records

Among the different types of Information available, Behavioral Information is very important to understand in order to better understand your employees and customers.

6- Attitudinal

Attitudinal Information is Information about people's attitudes, beliefs, and values.

Organisations can use attitudinal Information to better understand how customers feel about their products or services. This type of Information can help organisations make changes to improve customer satisfaction or target marketing efforts.

Examples of Attitudinal Information include:

- A company's customer service policies
- A company's dress code

- The way employees are expected to interact with customers
- The way employees are expected to interact with each other

7- Motivational

Motivational Information is Information that is designed to motivate someone to do something. This can include things like inspirational quotes, stories of people who have overcome adversity, or tips for setting and achieving goals.

Organisations can benefit from motivational Information by using it to inspire and encourage employees. This can lead to increased productivity and morale and can help create a positive work environment. Additionally, motivational Information can be used to help employees set and achieve goals, and can provide guidance and direction during challenging times.

Examples of motivational Information in organisations include:

- Employees who feel motivated at work are more likely to be productive and engaged in their work.
- A motivated workforce is essential to any organisation's success.
- Employees who are motivated to do their best work are more likely to be satisfied with their jobs and stay with their organisation.
- Organisations that focus on employee motivation tend to be more successful overall.
- Motivated employees are more likely to be creative and come up with new ideas that can help an organisation grow and succeed.

Storage of Information in RDBMS

- RDBMS stands for Relational Database Management System.
- RDBMS is a program used to maintain a relational Database.
- RDBMS is the basis for all modern Database systems such as MySQL, Microsoft SQL Server, Oracle, and Microsoft Access.
- RDBMS uses SQL queries to access the Data in the Database.

Information Analytics

Information Analytics is often used interchangeably with Data Analytics. But both are different concepts.

- **Definition:** Information Analytics focuses on the contextualization and interpretation of [Information] to provide insights that can inform decision-making. It emphasizes the transformation of [Information] into Actionable Information.

- **Scope:** It often involves [Information] visualization and reporting, making the Information accessible and understandable for stakeholders.
- **Objective:** The goal is to derive actionable insights and facilitate informed decision-making, often bridging the gap between Information and strategic business outcomes.

Contextualisation⁴

Contextualization of Information is the process of adding relevant background [details] to Information or a situation to make it more understandable and meaningful. It involves understanding the surrounding circumstances, relationships, and relevant details to provide a clearer picture and facilitate informed decision-making.

Here's a breakdown:

- **What it is:** Contextualization is essentially the act of placing Information within its appropriate setting. It's about answering the "why" and "how" behind the Data, not just the "what".
- **Why it matters:** Without context, Data can be confusing, misinterpreted, or even useless. Adding context helps reveal patterns, trends, and relationships that might otherwise be missed, leading to better insights and decisions.

Examples:

- In manufacturing, contextualizing [Information] from various sources (e.g., fuel consumption, weather, and AIS Data) can help identify the root cause of problems and optimize operations.
- In healthcare, understanding a patient's temperature reading in the context of their overall health and history (e.g., previous readings, symptoms) provides a more complete picture than the reading alone.
- In retail, sales figures need to be contextualized with factors like traffic patterns, holidays, and trends to understand their significance.

Benefits:

- **Improved understanding:** Contextualization makes Information more accessible and easier to understand.
- **Better decision-making:** With a clearer understanding of the situation, informed decisions can be made.

⁴ AI Overview

- **Enhanced problem-solving:** Contextualization can help identify the root causes of problems and facilitate effective solutions.
- **More valuable insights:** By revealing relationships and patterns, contextualization can unlock valuable insights that would otherwise remain hidden.
- **How it's done:** Contextualization can involve various techniques, including:
 - **[Information] enrichment:** Adding additional [details] to Information.
 - **Relationship identification:** Finding connections between different [Information].
 - **Pattern recognition:** Identifying recurring trends or anomalies.
 - **User experience considerations:** Tailoring Information presentation to the user's knowledge and needs.

Interpretation⁵

Interpretation of Information is the process of making sense of [Information] by assigning meaning and understanding to it. It involves drawing conclusions, identifying patterns, and making informed decisions based on the available Information. This process is crucial for turning raw Data into actionable insights and facilitating effective communication.

Here's a more detailed breakdown:

1. What is Interpretation?

- **Assigning meaning:** Interpretation is about understanding the significance and implications of Information, not just passively receiving it.
- **Making inferences:** Interpretation often requires drawing conclusions that are not explicitly stated in the Information itself.

2. Why is Interpretation Important?

- **Decision-making:** Interpretation allows us to use Information to make informed choices and solve problems.
- **Communication:** It enables us to convey the meaning of Information to others in a clear and understandable way.

⁵ AI Overview

- Learning and understanding: By interpreting Information, we can expand our knowledge, build new perspectives, and develop deeper insights into the world around us.
- Engagement and empowerment: Effective interpretation can make Information more accessible and engaging, fostering a sense of ownership and empowerment in those who receive it.

3. Different Forms of Interpretation:

- Information Interpretation: Analysing numerical and non-numerical Information to identify patterns, trends, and relationships.
- Text Interpretation: Understanding the meaning and significance of written or spoken text, including stories, articles, and reports.
- Visual Interpretation: Making sense of images, graphs, charts, and other visual representations of Information.
- Historical Interpretation: Understanding the meaning and significance of historical events, artifacts, and perspectives.
- Organisational Interpretation: How organisations make sense of new Information and integrate it into their processes and knowledge base.

4. Key Aspects of Interpretation:

- Critical Thinking: Interpreting Information effectively requires critical thinking skills, including analysing evidence, evaluating arguments, and identifying biases.
- Context Awareness: Understanding the context in which Information is presented is crucial for accurate interpretation.
- Communication Skills: Being able to clearly and effectively communicate the meaning of interpreted Information is essential.
- Active Engagement: Interpretation is an active process that involves engaging with the Information, asking questions, and exploring different perspectives.

5. Examples of Interpretation:

- Analysing a statistical chart: Interpreting the chart to understand the relationship between variables and draw conclusions about trends.
- Understanding a historical document: Interpreting the document in its historical context to understand the events and perspectives it describes.
- Making sense of customer feedback: Interpreting customer feedback to identify areas for improvement in a product or service.

- Interpreting a work of art: Understanding the artist's intentions, the symbolism used, and the overall message conveyed by the artwork.

Actionable Information⁶

Actionable Information is Information that has been contextualised and interpreted to provide clear, specific guidance for making a decision or taking immediate, practical action. It is relevant, timely, and presents patterns, trends, or insights that directly indicate a path forward, allowing individuals or businesses to make informed choices, solve problems, or capitalize on opportunities.

Here's a more detailed explanation:

Key Characteristics of Actionable Information:

- Contextualized and Interpreted: Actionable Information is presented within a specific context, making it relevant and easy to understand.
- Concise: It distills complex Data into clear and easily digestible insights.
- Timely: Actionable Information is provided when it's needed, allowing for prompt action.
- Specific: It outlines clear next steps or potential outcomes, guiding decision-makers.
- Directly Usable: It can be directly translated into practical steps or strategies.
- Results-Oriented: It focuses on outcomes and provides the basis for achieving specific goals.

Examples:

- Instead of just knowing a website's traffic increased, Actionable Information would be knowing that the traffic came from a specific marketing campaign and resulted in a 15% increase in sales.
- Instead of just knowing a customer service rating dropped, Actionable Information would be knowing that the login function on the mobile app is the reason for the drop and identifying the specific users experiencing the issue.

Benefits:

- Improved Decision-Making: Actionable Information empowers individuals and organisations to make faster, more informed, and confident decisions.

⁶ AI Overview

- **Increased Efficiency:** It streamlines processes by identifying areas for improvement and guiding actions.
- **Enhanced Performance:** By acting on timely and relevant insights, organisations can optimize their operations and achieve better results.
- **Competitive Advantage:**

Actionable Information can help businesses identify opportunities and capitalize on them before their competitors and it is essentially the bridge between [Information] and meaningful action.

Conclusion⁷

According to a 2020 NewVantage Partners report, 64.8% of Fortune 1000 companies surveyed have invested at least \$50 million into their Business Analytics efforts, and 91.5% attempted to implement artificial intelligence (AI)-based technologies in some form. While these figures appear to illustrate progress, the other side of the coin is only 14.6% of all responding businesses used these technologies across their operations.

Beyond the technologies and capabilities themselves, making accurate decisions based on facts and past performance remains at the core of business Analytics. As the counterpart to this, decisions relying on gut instinct (or, until roughly a decade ago, limited Data) result in costly investments, be it strictly in terms of money or the hours put into developing new initiatives that go nowhere.

Within this general framework, the insights gleaned ultimately help optimize and streamline business processes, eliminating any estimates and grey areas in the process. Thus, organization-wide optimization may encompass:

- shaping and evaluating future company decisions based on the performance of past initiatives or market trends;
- examining individual departments' performance within an organization and influencing their growth efforts;
- monitoring employees' performance and productivity;
- determining current and future staffing needs and the market skills needed to perform these roles effectively;
- assessing and predicting how well potential investments will perform;

⁷ How Data Analytics Influences Business Decisions: <https://business.wfu.edu/masters-in-business-Analytics/articles/what-is-Analytics/>

- identifying demand for a particular product or service based on market trends and consumer behavior;
- scheduling release dates for new products and media;
- evaluating product sales by location, and using that Information to meet future customer demands;
- creating optimal logistics routes for shipping and delivering merchandise;
- making product recommendations based on customers' past search habits;
- gathering Data from vehicles and equipment to improve future performance; and
- identifying potential growth opportunities for a business, and how these scenarios could play out.

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