

## BUSINESS ANALYSIS AND DATA ETHICS

### INTRODUCTION

As the core mission of business analysis is to **enable change**, business analysts should be positioned to play a key role in helping organizations address a whole host of ethical and legal challenges stemming from the rapid development and increasing deployment of AI/Big Data technologies. The GDPR, the CCPA (California Consumer Privacy Act), and proposed Federal legislation are creating a new legal landscape that organizations must respond to. Gartner recently identified **digital ethics** as a trend for 2019, but one can safely predict that it will be an important feature of the business landscape for years to come. Tech giants such as Microsoft are calling for regulations around AI technologies such as facial recognition. International associations such as the IEEE are developing standards for the design of **ethical AI systems** (see Ethically Aligned Design).

Given the growing concern with **data ethics** and a realization that **design** is a critical component of any solution (e.g., privacy by design), business analysts should be key players for organizations undertaking data ethics initiatives. Their core competencies in **analytical thinking, business and technical knowledge, and interpersonal skills** are precisely the abilities needed to drive the sort of change needed by end user organizations, or technology developers and integrators. As the EC High-Level Group on AI states (Draft Ethical Guidelines for Trustworthy AI), trustworthy AI requires “. . . a **continuous process of identifying requirements, evaluating solutions and ensuring improved outcomes throughout the entire lifecycle of the AI system.**” Such a process is at the heart of BA work.

The key for business analysts is to add to their stock of business knowledge the requisite **ethical knowledge**, consisting of the principles and concepts that make up data ethics. Business analysts are **subject matter experts and trusted advisors** in their domains who employ a robust set of skills to enable and sustain change. Adding data ethics to their knowledge base will enable them to take on a strategic role within their organizations as the latter engage in digital transformation within a context of ethical risk. This article will lay out a road map for relating business ethics skills to data ethics.

### CHANGE SCOPE

The **change scope** of a data ethics initiative by definition would have an ethical / compliance objective. For example, the desired change might be to bring an online data collection process into compliance with a new statute or regulation. The target process could involve public facing forms that capture PI in relation to an application for services, and it could route the data through a workflow, communicate outcomes with the applicant, and store information in a records system. The scope of the project could be to evaluate the process from end-to-end for compliance with the new laws and to redesign it if gaps are discovered. The current state would be the process as implemented. Based on a gap analysis, the future state would be a redesigned process that is sufficiently compliant and feasible within the range of options.

If the process had yet to be designed and implemented, it would be within the business analyst's area of expertise to development requirements and design documents for a new process. In such a case, this would be an example of privacy by design, where the product or solution developed has privacy objectives built into it. Business analysis, as a design discipline, fits the privacy by design paradigm well. Where the solution already exists, as in the forms/workflow solution in this example, then the initiative might be described as one of privacy by redesign. In any event, where the objectives of the initiative are ethical / legal in nature or have an ethical / legal dimension, the change scope will have an **ethical focus**.

### BA ROLES

According to the **BABOK**, the business analysis role is defined by a set of **core knowledge areas** and a set of specific skills. Knowledge areas are: **Business Analysis Planning and Monitoring, Elicitation and Collaboration, Requirements Life Cycle Management, Strategy Analysis, Requirements Analysis and Design Definition, Solution Evaluation.** (BABOK, 4-5)

The knowledge areas are really contexts in which, knowledge, skills and methods are applied. BABOK identifies a set of core **competencies** essential to business analysts but not distinctive of it. The competency categories, **analytical thinking** and **problem solving**, **ethics and professional conduct** (behavioral characteristics), **business knowledge**, **communication skills**, **interacting skills**, and **technical knowledge** (tools and technology), are combinations of knowledge, skills, and methods shared by other disciplines but foundational to the practice of business analysis.

The BABOK identifies 50 techniques that make up the practice of business analysis that are distinctive of the practice, though one can imagine that some of them at least can be applied in different contexts. These include **process modeling**, **document analysis**, **use cases**, etc. Some of these implicate skills or knowledge; others are products of the activity (e.g. **data flow diagrams**, **data dictionaries**). Importantly, subsets of the techniques are associated with all core knowledge area.

Given this matrix of knowledge areas, shared competences, and business analysis techniques, **two profiles of the business analyst** in relation to data ethics and be described. In the first profile, the business analyst is well versed in the techniques of business analysis across the major knowledge (application) areas. S/he is competent in the foundational skills as well, including having an understanding of organizations (business) and information technology. We can label this the **pure or strict** (or narrow) **business analysis knowledge profile** relative to data ethics. In the second profile, the same knowledge and skill sets are assumed, but we add **expertise in data ethics**. This knowledge includes knowledge of information law and the relevant ethical principles and concepts. We can label this the enhanced or **subject matter expert profile** relative to data ethics, that is, **BA + SME**. Business analysts are often **trusted advisors** with deep knowledge of the business and technical context in which they operate. A business analyst with knowledge of the regulatory context and compliance requirements for the industry in which s/he works extends this model and becomes an expert in a critical business area.

The different business analyst profiles would engage in data ethics projects in a way that corresponds to the difference in knowledge. Under the first profile, the business analyst applies business analysis techniques to the area of change targeted for the project. S/he works with the organization to scope the change, identify the current state, elicit future state requirements, prioritize solutions, develop requirements/design documents, develop a testing plan, review and test solutions, etc. Under the second profile (BA + SME), the business analyst will largely carry out the same tasks and apply the same techniques. The difference, however will center around the change scope. With subject matter expertise in data law and ethics, the analyst will not only work with the client to elicit and document the change scope and priorities, s/he will help determine and develop the desired changed based on a general understanding of laws and ethical norms relevant to the organization's industry and regulatory context. Whether working as a member of the organization or a third party solution provider, the analyst will play a consultative role in helping the organization recognize the changes needed and will contribute to formulating a strategy to address their needs. S/he will help the organization prioritize its needs and requirements based on the business analysis information captured and analyzed but also on an understanding of the relevant laws, norms and risks associated with them.

## BUSINESS ANALYSIS TECHNIQUES

The BA + SME profile is additive. The subject matter expertise in data ethics is disciplinary knowledge that is used in conjunction with BA techniques, skills and knowledge. Being additive, it can be conceptualized as receiving business analysis information as an input from the application of BA techniques. But the data ethics expertise also infuses the BA tasks and techniques. The BA not only elicits client requirements and priorities, s/he shapes them by providing data ethics knowledge. Any and all BA techniques can be employed in a data ethics initiative, and many will be influenced or shaped by data ethics expertise or at least more salient to it. The following techniques would likely be central to most data ethics projects and can serve as examples of the dynamic between the techniques and the subject matter expertise.

- Document Analysis
- Data Dictionary
- Data Modeling
- Data Flow Diagrams
- Decision Analysis
- Decision Modeling

- Business Rules Analysis
- Process Analysis
- Process Modelling
- Concept Modeling

## Document Analysis

**Document analysis** is the technique of reviewing documents, materials and information belonging to or relevant to the organization in order to gain an understanding of its needs (relative to the change scope). Documentation reviewed can include current solution documentation, business process diagrams, procedures, policies, organization charts, policy documents, etc. (BABOK, 269). In a data ethics project, document analysis will be critical. Documentation of the relevant information systems, (those capturing and processing ethically sensitive data) will be front and center. Further, a wide range of policy documents and authorities will need to be reviewed, including current statutes, regulations and decisions. Studying technical implementation documentation, process descriptions, policies and legal authorities would allow the analyst to understand the current state and its gaps relative to the change scope.

From the pure BA perspective, document analysis is critical to understanding the ethical requirements driving the initiative. It will serve as a way of building up subject matter expertise over time. From the BA + SME perspective, document analysis will be built into the analyst's knowledge base, as s/he will be familiar with the background legal rules and typical policy documents. This will allow the business analyst to identify gaps in the policy documents themselves and help develop policies and practices in areas where they are in flux (e.g., AI).

## Data Dictionary and Data Modelling

A **data dictionary** is used to identify and characterize data elements that are part of or relevant to a solution. It provides standardized definitions of data elements and rules of usage and combination. (BABOK, 247) It therefore provides semantic and syntactic rules related to the solution. A **data model** describes the data objects (entities, classes) (BABOK 257) and their attributes and relations. Again, it provides semantic and syntactic rules for the solution's data, as well as elements of an **ontology**. Ontologies are descriptions of fundamental components of a domain, objects, attributes, relationships, events, etc. that are used to model it. A data model has elements of an ontology and might be thought of as a partial ontology. The BABOK does not include **taxonomy** development as a BA technique, but it is closely related to data dictionaries and data modeling.

The importance of reviewing or developing data dictionaries and data models is clear where the ethical and legal concerns focus on the nature of the data. Understanding what personal or sensitive data exists in a solution and how it can be combined to create richer data sets and information will be at the heart of many analyses. The business analyst will use data definition and modeling techniques to capture the semantics and syntax of the current and future state of the solution. From the BA + SME perspective, understanding the norms that govern the capture, use, processing and security of the data elements will inform the analysis and pave the way for a road map to the future state solution.

## Decision Analysis and Decision Modeling

**Decision analysis** is a technique used in business analysis to formally define a problem, identify its possible outcomes, and evaluate the outcomes relative to a set of **values** or **objectives**. The values are often financial values or some business benefit. The focal point of the decision may be the implementation of the solution or components of the solution, or it may be a decision point implemented in the solution. Because decision making is also a principle focal point of ethical analysis and because ethics initiatives introduce **normative values** and objectives into the decision process, decision analysis is a highly valuable BA technique that business analysts should hone. The BA + SME perspective will bring background knowledge of ethical and legal analysis to the use of the technique. It will also bring an understanding of fundamental ethical principles that frame the value domain being incorporated into the decision structures. Principles include the **principles of non-harm (non-maleficence)**, **fairness**, **beneficence**, and **responsibility**. Being able to incorporate ethical analytic methods and principles into decision analyses enables the business analyst to move beyond elicitation and documentation to make a substantive, consultative contribution to the solution envisioned.

Related to decision analysis, **decision modeling** represents current state and future state decision making occurring in repeatable business process. Decision tables and trees depict the business rules that convert input (in the form of data) into output (in the form of decisions). Decision diagrams describe decision points in relation to input sources, base knowledge and outcomes. From the pure BA perspective, decision modeling techniques serve to bring out the relation of data to decisions and the rules that determine these decisions. This in turn aids in identifying compliance and ethics gaps in relation to the data (e.g., privacy) and decisions (e.g., fairness, due process). From the BA + SME perspective, this tool is also useful for creating models of compliant processes. For example, relative to a certain kind of decision in a specific institutional context (loan, employment, etc.), the BA + SME can use decision modeling to create a general model that encapsulates due process or non-discrimination requirements in terms of proper and improper inputs, relevant and irrelevant factors, weighting criteria, etc. The analyst can also use his/her knowledge to build out compliant decision process models within the specific business context as design requirements for a new or revised process.

## Business Rules Analysis

Business rule can be characterized as operationalized directives that guide behavior in an organization. (BABOK, 240) Business rules describe what should happen under specific (and sometimes general) conditions. Sets of business rules provide decision or action paths for predictable conditions and are often represented by if-then conditionals, decision trees and matrices. They are fundamental constituents of business processes and in the IT context are targets of algorithmic automation. The business analysts typically attempt to identify actual (current state) business rules in effect (explicitly and implicitly) within business processes as well as future state rules for improved processes.

From an ethics perspective, business rules are particularly salient because they connect the specific actions and behaviors of the business with specific conditions. In other terms, they operationalize the values and judgments of the business and are the engines behind its actions to the extent that the actions are process based. Business rules will therefore be key targets for ethical analysis and evaluation where the change scope is an improvement in ethics based objectives. The BA + SME will bring subject matter knowledge concerning the appropriateness of business rule conditions or factors, their weighting, and their consequents or outcomes. They will be better positioned to advise as to whether rules are singly or in combination fair and beneficial, or biased, coercive, or detrimental to legitimate interests. The BA + SME will also be better positioned to guide the organization to formulate business rules that are compliant with ethics objectives such as due process, substantive fairness and avoidance of harm.

## Process Analysis and Process Modeling

Process analysis is a technique that focuses on understanding and evaluating business processes (defined as sets of coordinated activities that achieve a specific objective) in terms of their effectiveness and efficiency in achieving organizational goals. (BABOK, 314) A process consists of inputs, decision (business) rules, actions, and events that accomplish the work of the organization in a structured and repeatable way. **Process modeling** is the technique of representing the different steps of the process at different levels of abstraction or granularity with graphic tools such as UML or BPMN activity diagrams and narratives.

Processes are analyzed with an eye to improvements in efficiency in relation to consumption of resources and their effectiveness in advancing organizational goals. Where the change scope has an ethics focus, processes will be analyzed in relation to their fairness and their effectiveness in increasing good and minimizing harms. Subject matter expertise in ethics will enhance the use of analysis and modeling techniques by providing substantive criteria against which to measure the ethical quality and efficacy of a process. In addition to analyzing the ethics of specific business rules, the analyst will look at steps in the process to determine if they increase ethical risks. For example, a step in the process may be inherently unfair or it may expose sensitive personal information unnecessarily. The application of BA process analysis and modeling techniques will generally help bring out these risks by providing a clearer representation of the processes under scrutiny, but the addition of subject matter knowledge enhances the analysis by guiding the analyst to focus on the relevant issues, applying the appropriate evaluative criteria, and identifying and explaining risks that the organization may not fully appreciate.

## Data Flow Diagrams

A **data flow diagram** represents the movement and **transformations** of **data** through a process. Sources of data (inputs), processes applied to data, transformations of the data, outputs to other processes or storage points, etc. are represented in data flow diagrams. The diagram can be **logical** (representing the changes to the information) or **physical** (representing physical output to printers or write-actions to storage devices). (BABOK, 250) Process diagrams and decision modeling may capture data flows within their representation, but a data flow diagram has the benefit of focusing on the data itself.

Where the ethics change scope is focused on the data itself (privacy, confidentiality, intellectual property, prejudicial representations, etc.), data diagrams can clarify how information is captured, processed, changed, disseminated and retained. This will help identify gaps in relation to ethics and compliance requirements. From the BA + SME perspective, a set of normative concepts and guidelines will be available to focus the data flow models on relevant data and to evaluate the data related activities effectively. It is one thing to understand where data comes from, how it is transformed, and where it goes. It is another thing to understand the ethical and legal significance of these transformations and movements.

## Concept Modelling

**Concept modeling** is a technique that defines and **organizes knowledge** about a **business domain**. (BABOK 245-6) It provides general or abstract definitions in relation to the **core entities** addressed by and involved in the enterprise's activities and operations. It can be represented by a **glossary, taxonomy, ontology** or **concept map** with key terms defined and explained. Concept modelling provides a **conceptual foundation** for business rules, decision analysis and modeling, and process analysis and modeling. (Ibid. 246) It can be used to bring clarity to business processes and objectives and create a shared **mental model**.

From the BA + SME perspective, concept modeling is a fundamental tool that aligns with an overlaps with expertise in ethics, as ethical knowledge in large part consists in the analysis of ethical concepts and the construction of theoretically and practically valuable definitions and characterizations. Concept modeling will therefore be an important part of an ethics initiative as entities involved in the change scope will need to be characterized in such a way that their ethical salience is clear. For example, roles such as **agent, processor, representative, manager, data subject**, etc. require definitions in order to make the business processes of the enterprise understandable, and to make their ethical meaning clearer. Where legal requirements exist relative to these business processes, statutes and regulations will provide a legal concept model in the form of definitions and rules of application that will have to be interpreted by the analyst. Ethical and legal concepts that represent constraints on business activities such as **conflict of interest, confidentiality, procedural fairness, substantive fairness, privacy**, etc. will need to be defined and integrated with the enterprise concept map. To the extent that the business analyst understands and has at hand legal and ethical concept models, s/he will be well positioned to work with the organization to develop a comprehensive concept model that supports the analysis and modeling of data, decisions, and processes within the ethical change scope.

## DATA ETHICS SUBJECT MATTER EXPERTISE

The road map for gaining the requisite ethics knowledge to complement the BA role consists in reading a manageable set of books and documents on ethics and information law. In a subsequent post I will list some references that will provide an excellent foundation. The two sources I cited at the beginning of this brief (by the IEEE and the EC High-Level Group on AI) are good places to start, as well as the Menlo Report (US DHS). Links are below.

### Draft Ethical Guidelines for Trustworthy AI (EC High-Level Group)

[https://ec.europa.eu/futurium/en/system/files/ged/ai\\_hleg\\_draft\\_ethics\\_guidelines\\_18\\_december.pdf](https://ec.europa.eu/futurium/en/system/files/ged/ai_hleg_draft_ethics_guidelines_18_december.pdf)

### Ethically Aligned Design (IEEE)

[https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/ead\\_v2.pdf](https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/ead_v2.pdf)

### Menlo Report (DHS)

[https://www.caida.org/publications/papers/2012/menlo\\_report\\_actual\\_formatted/](https://www.caida.org/publications/papers/2012/menlo_report_actual_formatted/)