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A Larsen & Toubro Group Company

Data & Analytical Sophistication (DANAS) Framework:

A Simple Way to Chart Digital Transformation

Executive Summary

Over the past decade, smaller to large enterprises have increased their pace of digital transformation, which is not surprising given that many potentially disruptive digital technologies have come forth bringing with them the promise of significant change. Enterprises are incorporating these technologies into their products and solutions, use cases, and best practices. And that's why, after Business Intelligence (BI) and Artificial Intelligence (AI), Digital Transformation (DX) and Customer Experience (CX) are getting a lot of attention from CXOs, because organizations are beginning to understand that their entire business is centered around the customer. Building a happy and loyal customer base is thus an imperative. Digital transformation has emerged as a business enabler and has rapidly gained a lot of traction, especially in today's Volatile-Uncertain-Complex-Ambiguous (VUCA) world.

Introduction

Digital transformation manifests in enterprises in different ways, but the objective behind building a digital enterprise is shared by C-level executives across the world. They want their teams to collaborate and be more effective and productive, keep clients engaged, add more clients through enhanced customer experience, and drive down costs by leveraging technology in innovative ways. They want to build a competitive edge and embrace digital transformation to remain relevant in the face of newer, smaller players entering the arena and eating into their market share. Adding to the chaos are rapid advancements in the field of Operational Technology (OT) and Information Technology (IT). As a direct corollary, rapid technology obsolescence is also affecting the marketplace, making digital transformation not just a business strategy but a vital tool for survival. However, with varying levels of maturity in information management and business analytics, as conveyed by the TDWI Maturity Model, enterprises are unclear about their digital transformation journey – how to progress, or in some cases even where to begin.

The Dimensions of digital transformation

Digital transformation is an intelligent change in the way businesses work with their data, with the objective of bringing in disruptive outcomes and growth with right decisions at right time. There is a growing need for informed decision making in businesses, and leaders no longer base their decisions on gut feel alone but on actual facts. And these facts, or insights, are extracted from raw data that pours in from multiple sources due to digitization of business processes by organizations. In essence, digital transformation has two dimensions:

Data dimension

The first dimension is related to data, and involves developing a deep appreciation of all the data assets in possession of an enterprise and devising a way to capture and tame that data influx.

An organization's data, internal and external, comes from disparate sources and is extremely variegated. Internal data is generated because all the core business processes within the enterprise have been digitized using various Online Transaction Processing (OLTP) systems. Be it customer origination and onboarding using a customer relationship management (CRM) tool, or the order to cash process using an enterprise resource planning (ERP) application, or sales using a point-of-sales (POS) system, tons of data gets generated internally. Most of this data is structured, but parts of it can be unstructured like data contained in emails or instant messages or business documents.

A lot of data also gets exchanged with external sources such as customers and partners, and can happen via EDI gateways, FTP sites or even cloud-based file hosting services like Dropbox, Evernote, Google Drive etc. Some external data sources expose Application Programming Interfaces (APIs) through which data can be exchanged in semi-structured format like XML, JSON etc. Unstructured external data, like that from social websites, can be pulled in via web scrapping or using API calls, and can be stored in data lakes. Based on the sources whether internal or external and the format whether structured or unstructured, as mentioned above we can classify the Data Dimensions in to five categories: "Internal Structured", "Internal Unstructured", "External Structured", "External Unstructured", "Public Domain Data".

Regardless of the source or type of data, what's imperative is that algorithms with probabilistic fuzzy logic are required to combine internal and external data to extract useful insights. This poses a great challenge for organizations.

Analytical Sophistication dimension

The second dimension is related to analytical sophistication i.e. the need to go up the analytical value chain.

From a generic perspective, Descriptive Analytics deals with identifying "what has happened" based on historical data, and Diagnostic Analytics, tries to answer "why did it happen" by identifying patterns and associations between variables. These descriptive and diagnostic analytical capabilities are currently handled by BI tools like PowerBI, MicroStrategy, Tableau, Qlikview, Spotfire, etc. In this case, decision-making is based on the premise that future success lies in repeating best practices of the past or in correcting past mistakes. But this approach doesn't always work, because a dynamic business environment and ever-shortening decision-making windows call for real-time or near real-time intelligence along with locational intelligence, contextual intelligence, behavioral analytics and sentiment analytics.

Prediction for future is associated with probability and is uncertain. Prescriptive analytics tries to make it more definitive and thus help you to be prepared for the eventuality. Both Predictive Analytics and Prescriptive Analytics require more sophisticated computation abilities of ML, and Deep Learning algorithms. Artificial Intelligence and Cognitive Intelligence are still higher order analytical sophistication, which make use of Natural Language Processing, Image Recognition and Speech Recognition abilities to bring in more human like intelligence and learning-on-the-go abilities to analytics. Enterprises have started investing in a pool of data scientists and focusing on the application of the higher order analytical techniques to solve business problems and thus impacting the business outcomes.

Based on the above we can classify the Analytical Sophistication Dimension in to six categories: "Descriptive Analytics", "Diagnostic Analytics", "Predictive Analytics", "Prescriptive Analytics", "Artificial Intelligence" and "Cognitive Intelligence".

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Introducing the DANAS Framework

The Data and ANAlytical Sophistication framework – or DANAS – can be leveraged as a matrix framework ideal for visualizing and base-lining all digital transformation initiatives. Plotting the data types in the horizontal axis and the levels of analytical sophistication in the vertical axis, the DANAS framework looks something like this:

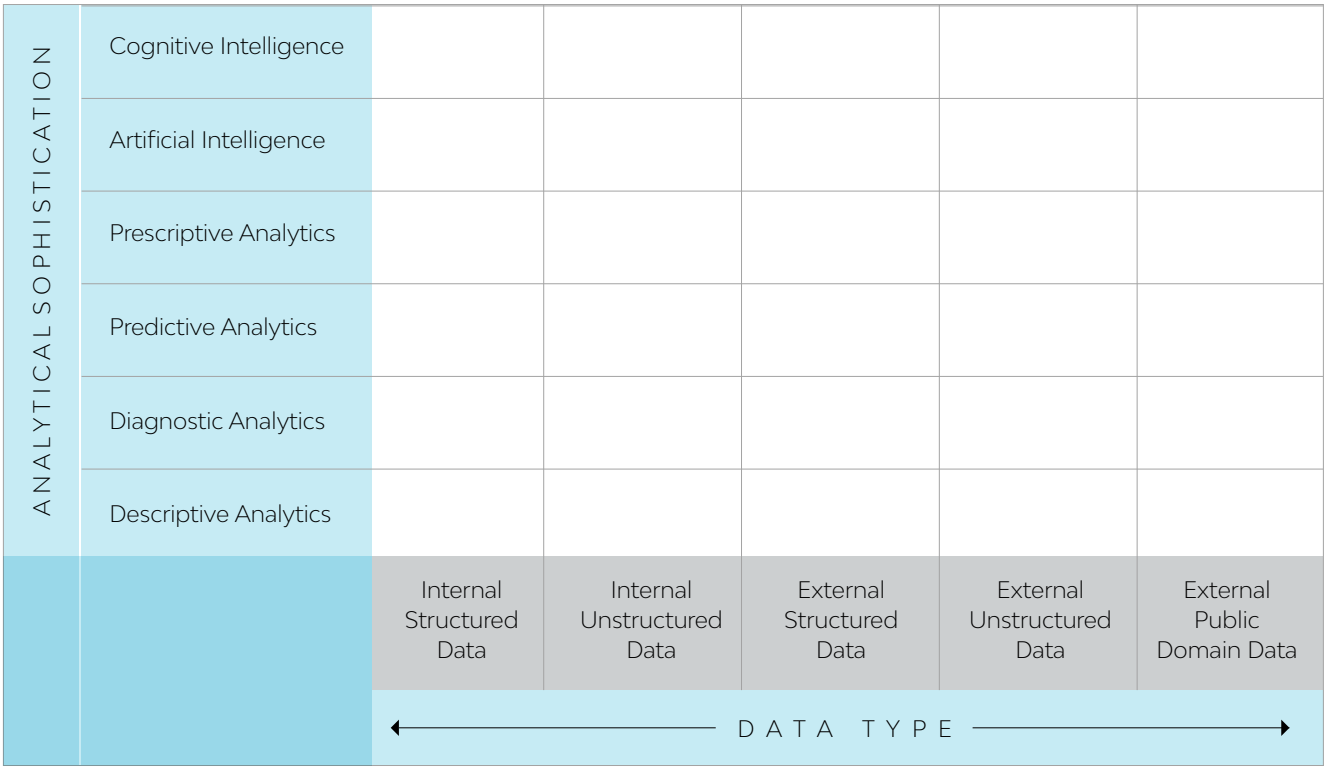

Fig. 1: The DATA AND ANALYTICAL SOPHISTICATION (DANAS) Framework

This framework acts like a guide for digital transformation journey and allows users to map their business use cases at the interaction of the data types and the analytical sophistication types. Sometimes one use-case may need more than one data types and/ or more than one analytical sophistication techniques.

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Using the DANAS Framework

Typically, most digital transformation initiatives are either envisioned by the business organization or by the CDO/ CIO organization within an enterprise. In either case, the taskforce in charge of these initiatives can use this simple DANAS framework to identify use cases and also to help them prioritize. Follow the below steps to use the DANAS framework:

- While thinking of any business use case, think about the business problem which you want to resolve, break them down to one or more hypothesis
- Then think about the level of analytical sophistication that is needed to solve such hypothesis and
- Think about what kind of data will be needed to prove out such hypothesis
- Map that use case at the intersection cell of the corresponding row and column
- Sometimes you may feel that more than one data type may be involved, or more than one sophistication level may be involved, in that case select one which you consider primary and use them to map in the DANAS matrix.

Say for example an Oil & Gas organization has selected a use case for "Sub-surface Digitization of Well-logs and Seismic-logs". This involves scanned images of the internal well logs and seismic logs as the data which belongs to "internal unstructured" data type and it involves sophisticated deep learning and image recognition abilities to be able to extract meaningful metadata information from those images which falls under "Cognitive Intelligence". Hence this use case can be mapped at the cell 2,6 i.e. 2nd column from the left and 6th row from the bottom.

Here are some more sample DANAS frameworks applied to specific domains to help you better understand the framework even better.

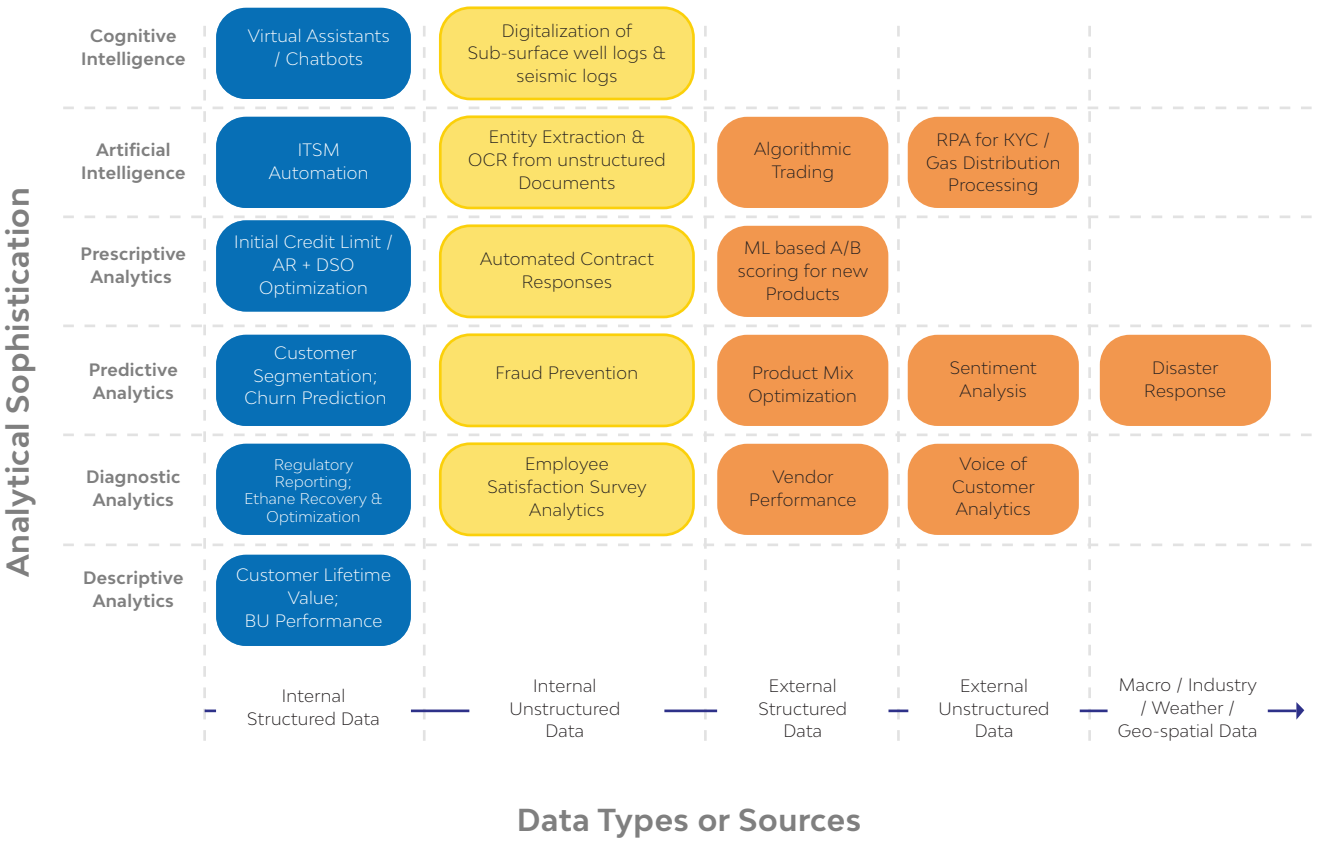

Fig. 2: Oil & Gas - Opportunities at the Intersection of Data & Analytics Sophistication

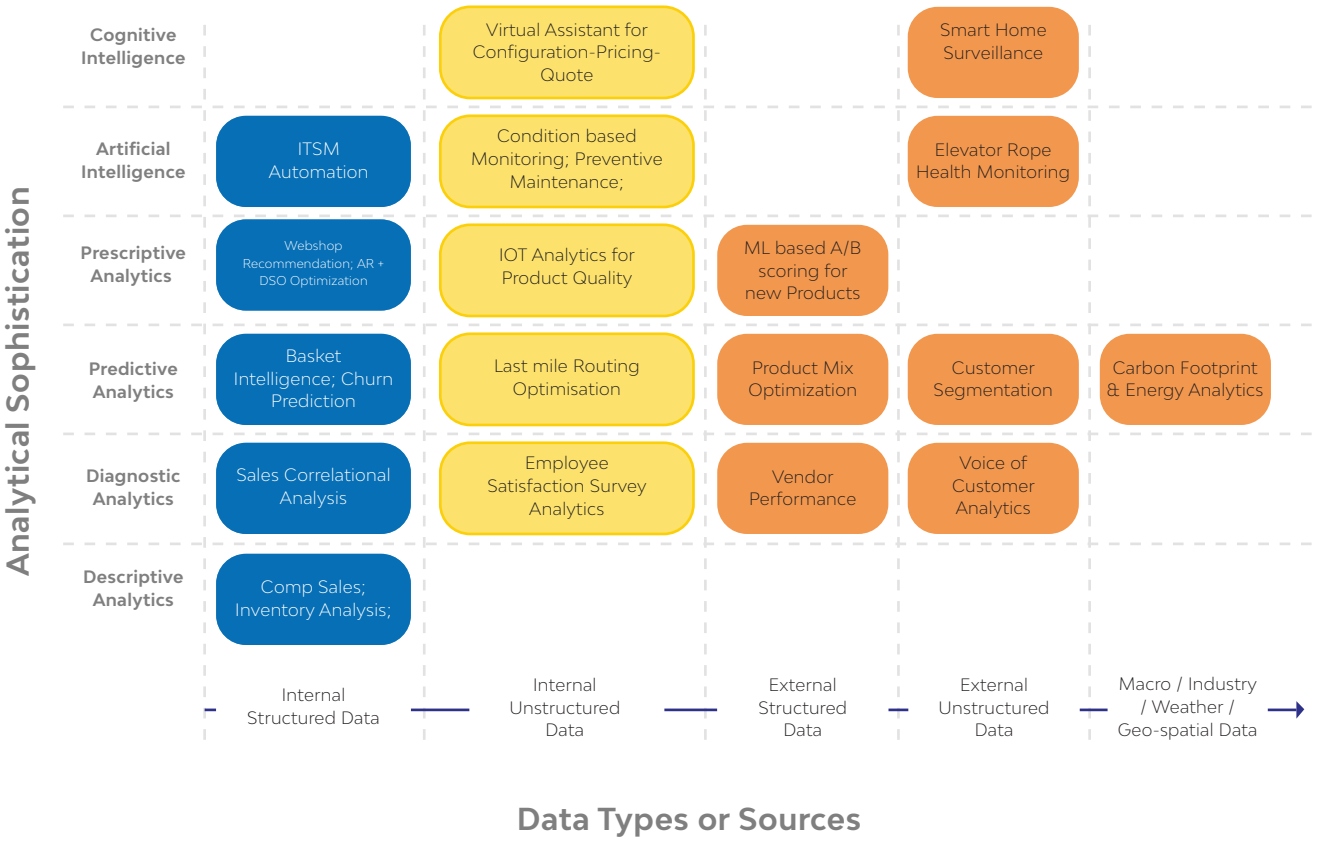

Fig. 3: Manufacturing - Opportunities at the Intersection of Data & Analytics Sophistication

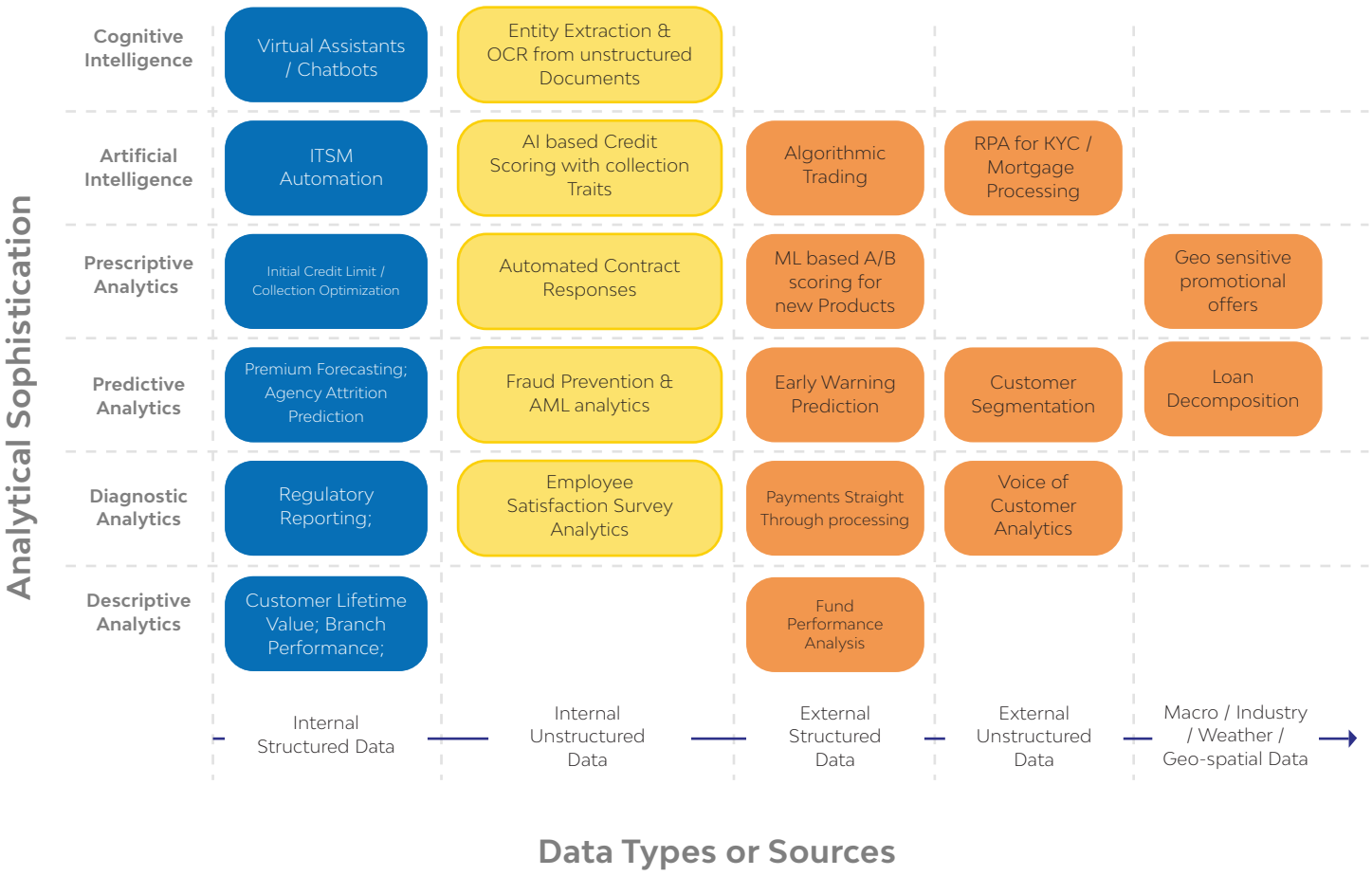

Fig. 4: BFSI - Opportunities at the Intersection of Data & Analytics Sophistication

Conclusion

In today's world, adaptation to change is a constant factor that every enterprise has to deal with. Under the circumstances, digital transformation seems to be the best strategy especially for breakaway enterprises, and with a trusted consulting partner in tow. The application of new-age technologies for the higher order analytical solutions, while similar to traditional IT practices to a large extent also calls for new methodology and approach. The three pillars of people, process and technology should come together and reorient themselves so as to align with the right trajectory of success. These trusted partners bring in the modern best practices, the new-age competencies and capabilities and the DANAS Framework presented above can act as a trustable guide in the digital transformation journey.

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Arup has been leading the Sales Engineering function of LTI's Mosaic platform since 2017. He has a rich experience in the IT Consulting Industry, especially focused on Information Management and Business Analytics domains. In the past, he has been instrumental in setting up a 450+ member Analytics Centre of Excellence for a professional services organization in India. He has the distinction of successfully delivering Information Management & Analytics projects for about 25 clients, including some fortune 500 customers covering USA, Singapore, UK, Denmark & India. He holds a Bachelor of Production Engineering Degree from Jadavpur University, Kolkata, India and MBA in Finance & Systems from XLRI, Jamshedpur, India

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