# FAST TRACK ARTIFICIAL INTELLIGENCE, MACHINE LEARNING AND INTERNET OF THINGS INITIATIVES WITH MASTER DATA MANAGEMENT

Some of the most promising themes within digital transformation revolves around new possibilities with Artificial Intelligence (AI) and Machine Learning (ML) and the rise of Internet of Things (IoT). The organizations that are best at encompassing these emerging technologies and the surrounding business models and services will be in front of their competitors and will ultimately be the ones that survive in the future.

However, there are possible potholes, detours and blind alleys on that journey. Or to put it more directly; if you do not have a firm grip on data quality, you will run into a lot of obstacles that will delay your journey seriously. Enter Master Data Management (MDM).
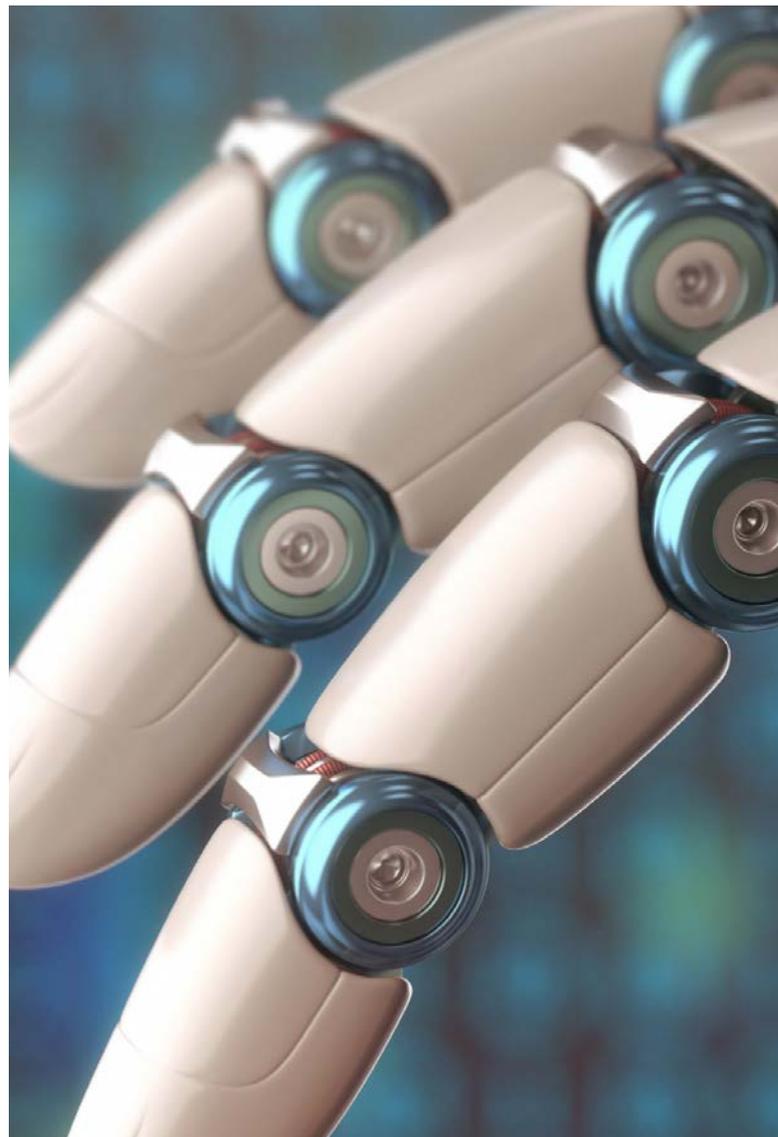
Why MDM is crucial to success with AI, ML and IoT

The lifeblood of AI, ML and IoT is data and the circulation of data must run automatically. This is only possible with data of high quality. Master data that is used throughout many business processes and therefore must be fit for use in many different scenarios must meet a range data quality dimensions in order to underpin automated business processes.

Data quality efforts must be sustainable

If data quality is not continuously maintained, the data that was of high quality at a given time for a given purpose will very quickly decay. Such unmaintained data will not be suitable for use in AI supported business processes or be suitable for operating IoT environments and analysing the data gathered in such environments. The data that is most compromised in this challenge is the master data that describes the core entities involved in these business processes and environments.

MDM is the right solution to use to onboard reusable master data and control the lifecycle of that data.

Complexity must be encapsulated

As humans we have a natural born capability to understand the complexity of the who, what and where of the core entities involved in business processes and data gathering. Machines must have a digital digestible way of getting that picture.

MDM is the best solution for providing AI with an encapsulated description of the related core entities involved in business processes and (the same) core entities involved in connecting smart devices in IoT environments.

Why AI is relying on data quality

The business advantage of using AI is to automate business processes and get faster and more reliable business decisions.

The risk of unwanted business outcomes

However, if the AI processes runs on top of data that is not unique, accurate, consistent and timely these processes will not produce reliable results and therefore lead to unwanted business outcomes. Examples of such unwanted business outcomes can be:

- Making different decisions for two customer or supplier master data records that in fact describes the same real-world party.

- Recommending a product to a customer where a very similar product has previously been returned.

- Accepting a purchase from a vendor, where another company family member has previously been ruled out.

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Such results can have a very negative impact on business outcomes, the reputation of your business and make your business reluctant to embark in new AI initiatives which thus eventually can put your business behind your competition inadvertently.

Avoiding endless data cleansing

A backbone reaction to data quality issues in AI processing will be to start on-the-fly cleansing the data that goes into that process. This kind of symptom relief will unfortunately be extremely costly and unhealthy in the long run and will only become unmanageable if more business processes are to be AI supported.

The better way is to cure the data quality issues in a sustainable way by using a capable MDM solution.

Rationalizing data used for ML

Machine Learning (ML) is the discipline used to ignite Artificial Intelligence (AI). While you support the machine with training data for ML it may be tempting to do a little data cleansing as the training data will not be part the continuous future AI processing.

The risk associated to taking this approach is that you will probably cleanse each training dataset a little bit different. This means, that when more AI supported business processes start to interlink, they will have a different "way of thinking". You will then have the same situation as when humans do not work very well together.

The answer is to have your training datasets derived from already rationalized production data having the same master data foundation.

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Using rationalized data in AI

Having your AI supported business processes running on top of master data that is unique, accurate, consistent and timely will make a huge positive difference for the business outcomes achieved from applying AI. The results will be reliable. The processes will be repeatable over time. The concept will be reusable in other scenarios.

Why IoT will extend the scope of MDM

The potential in the Internet of Things (IoT) theme is enormous. We will increasingly use smart devices that are connectable in our daily life. Perhaps even more significant, manufacturers will use smart machines that are connectable within the Industrial Internet of Things (IIoT) theme – sometimes also referred to as Industry 4.0.

Products turn into intelligent things

Within data management we have traditionally handled what can be seen as a product model like a certain model of a refrigerator and a certain model of a drilling machine. When each produced instance of that product model becomes intelligent, we will see requirements and opportunities for handling each instance – each thing or asset - as a master data entity.

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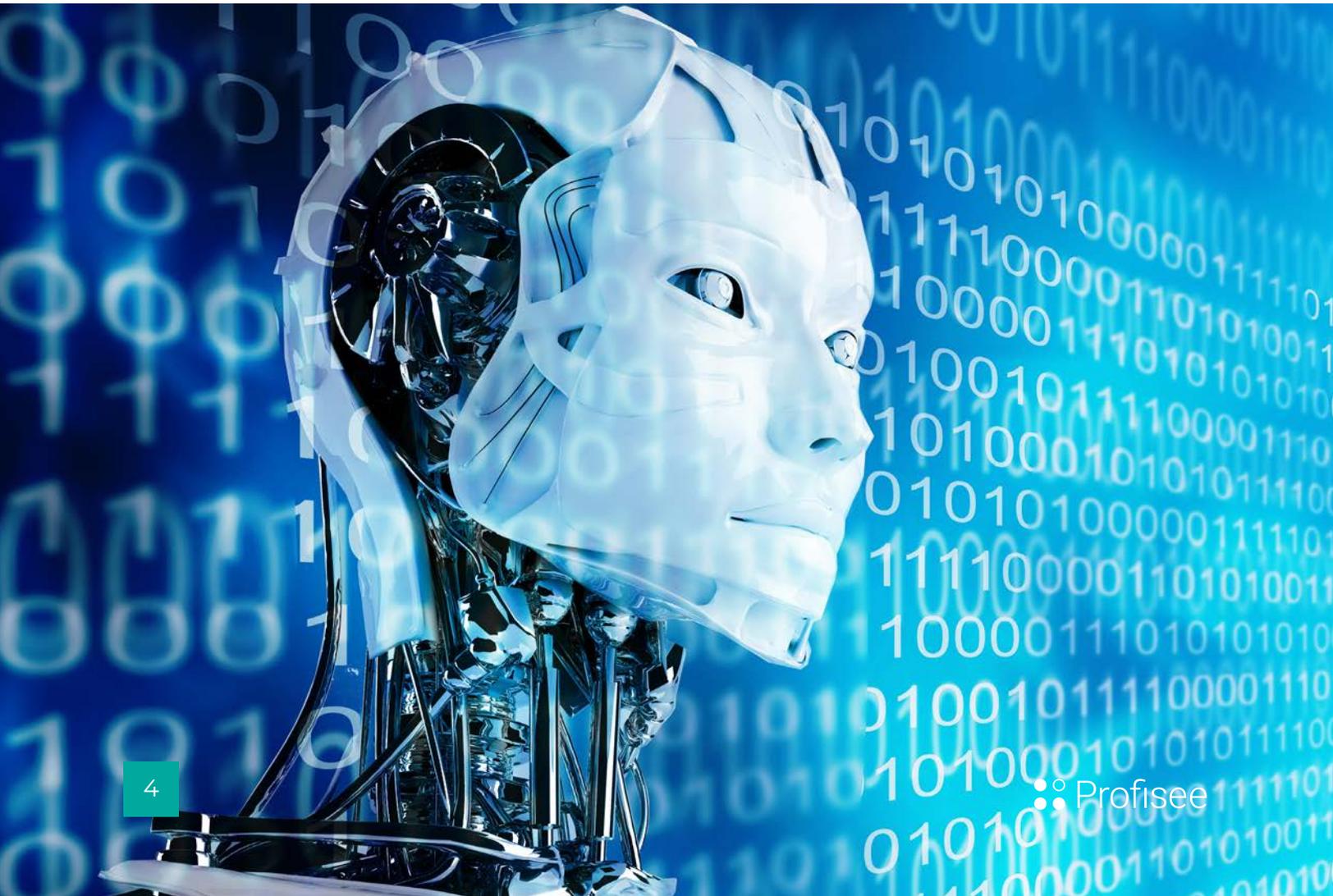
Master data relationships increase drastically

In the traditional master data set up, we must have the capability to encompass relations between customers and products such as product models a given customer have bought, what locations a customer (and other party roles) are connected to and what locations a product is connected to.

With IoT the number of relations will increase drastically. A thing will have relations to many party roles as who is the manufacturer, who is the operator, who is the maintainer and who is the owner. A thing will shift locations and we need to be more precise about that location. Each product will have many things with varying configurations produced as a given model with its basic specifications.

This complexity can only be manged with a true multi-domain MDM solution that covers the aspects of party master data, location master data, product master data and asset master data.

Data protection and data privacy must be controlled

A huge risk in managing the many party relations attached to a thing is the data protection and data privacy requirements. You cannot risk having these data floating around in a none documented, and none controlled matter.

Only an MDM solution can give you the needed degree of oversight to not run into data breaches and data privacy violations that may harm your business, promote risks of compliance/regulation violations and derail your IoT journey.

How MDM will help fast track AI, ML and IoT initiatives

Master Data Management (MDM) is your trusted companion in your digital transformation journey that will pave the way when exploiting Artificial Intelligence (AI), Machine Learning (ML) and Internet of Things (IoT).

When applying the right MDM solution, you will mitigate a number of risks around data protection and data privacy that else potentially will block your way forward. You must avoid the risk of being too fast away and thereby produce unwanted business outcomes because your data quality cannot meet the need for fast circulation of unique, accurate, consistent and timely data.

You will remove a range of obstacles that will save you from being trapped in roadblocks in the long run. Such obstacles include a missing 360-degree view of customers and business partners, missing relationships between customers, products, assets and locations and descriptions of these entities that is missing critical data elements.

When using MDM intelligently you will only cleanse data once and you will prevent data quality issues from reoccurring. You will manage the complexity of overseeing the many entities and their relations that must be digitally digestible throughout your deployment of AI supported business processes as well as operating the IoT landscape and analysing the big data sources from there. You will also rationalize your use of training datasets in ML.

All in all, you will, when going the MDM route, find yourself on the fast track where your consumption of resources will be overall minimized, you will take the smart paths around roadblocks and not run into dead ends.

MDM features you need to include in digital transformation

An MDM solution needed to underpin your digitalization journey must have mature capabilities in mastering multiple master data domains and have some essential data quality oriented functionalities.

Master Data Domains

Party master data
Uniqueness has always been the main challenge when mastering customer, supplier and other party roles played by the real-world entities that interact with your organization. Having a 360-degree digital digestible view of customers, suppliers and other business partners is the entry ticket for starting in the ML, AI and IoT race.

Location master data
Accurate and precise location data that are shared by all AI supported business processes and used throughout operating the IoT landscape and analysis of the extracted big data here from is a must for having a successful digital transformation journey.

Product master data
Consistent and complete product data that conforms to relevant standards for each product group must be available enterprise wide and usable in the business ecosystems where your organization participates.

Asset (things) master data
Unique, accurate, consistent and timely recording of the smart devices and machines deployed in IoT environments and their relations to parties, locations and product models is the latest extension of the MDM world.

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Essential MDM capabilities in the AI and IoT era

Metadata management

Using the same word for different things and using different words for the same thing is confusing for humans. For machines, it is mortal. Though AI have the potential to overcome this challenge, we can make the life of AI and IoT environments much easier by having a firm grip on the terms in use in such environments not at least around master data that is used in many different scenarios.

Data matching

Achieving uniqueness by merging duplicates is obtained by using data matching. There is an interdependency with AI in this quest. AI can help with data matching and AI is depending on unique data to perform optimally.

Golden record management

A digital digestible view of rationalized master data entities is best presented using golden records that provides a unique and complete view of entities involved in AI supported business processes and in IoT landscapes.

Event management

Master data and the golden records that exhibit this data must be continuously maintained through event management that ensures the right absorption of any changes in a timely matter.

Summary

You need a viable multidomain MDM solution such as Profisee to ensure that you are on the fast track on your digital transformation journey. In order to avoid delays and getting lost in exploiting AI, ML and IoT you must operate with data of high quality in a sustainable way and you must provide shared digital digestible representations of all the master data entities involved. Thereby you will mitigate the risks ahead, remove the many obstacles you may run into and ensure a successful and timely execution of the digitalization initiative.

Check out the Profisee blog for more helpful resources, best practices, and strategy around Data Management.

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