RUSSULA

DIGITAL TRANSFORMATION

How to move from plan to execution

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Background and Status Quo

In the 1980s computers began to be massively used in homes, universities and companies. In the 1990s Enterprise Resources Planning software (ERP) and Manufacturing Execution Systems (MES) spread across companies. From the 21st century on, the development on the internet and smartphones has changed the way we communicate with each other. Nowadays, people are digitalizing almost everything in their ordinary lives.

Meanwhile, digitalization took a different path in factories and developed at a different rate. Digitalization technology was less common in industry than in homes, due to its cost and focus. It required greater availability, reliability and performance, more communication protocols, security restrictions and big data processing. All these factors led to a poor digitalization adoption in industry.

Massive use of digitals technologies in industry has not evolved as much as in ordinary life, incredibly, smart manufacturing is still in the early stages of adoption. According to the 2019 Manufacturers Alliance for Productivity and Innovation Study, more than 60% of factories are in the early stages of digital maturity, and only 5% of them have a complete footprint in digital transformation. Driven by the exponential growth of disruptive technological development, there are many opportunities. We can summarize it in one phrase, "data is the new oil and decisions based on data are the new end goal". There is an industry determination for digital transformation, like never before in history. How to empower industry leaders and their teams to use data to make proper decisions and achieve business goals is the focus of this paper.

Here are some examples of how digitalization is disrupting industry:

1. Production scheduling & planning: Instead of downloading from the ERP to the production line, planning and scheduling could be generated from relevant data in real-time, which would allow fast adjustment in production sequences with greater versatility.

2. Cloud oriented: With the popularization of Software as a Service (SaaS) or subscription of software and hardware on demand, users could pick and choose according to their necessities and providers could maximize benefits. The digital factory could adapt its installed technological capacity from a number of fixed servers to hours of use, services and functionalities contracted.

3. 3D printing: Additive manufacturing will allow samples of products or some spare parts to be ready in minutes and not wait for weeks.

4. Big data analysis: Improving manufacturing planning by giving an online view of bottlenecks and how to solve them, for example, the statistics processed in real-time for the establishment of production campaigns could be capitalized in a similar way to how transport routes are planned in logistics.

Understanding Digital Maturity

Manufacturers are aware there is no single digital factory setting approach, due to variations in layouts, products, degree of automation, etc. while necessary components for digital transformation are widely known due to their universal relevance, i.e. people, data, products, services, infrastructure, process, cybersecurity, etc.

The industry can focus on making a practical and effective plan from 'true current' to 'desired future' status by evaluating and understanding digital maturity, keeping in mind that 'future status' is not always a 'real end state' because the target is always moving faster. Understanding where you are today will allow your team to address any major roadblocks in the digital transformation roadmap. Let's approach analysis through following holistic dimensions:
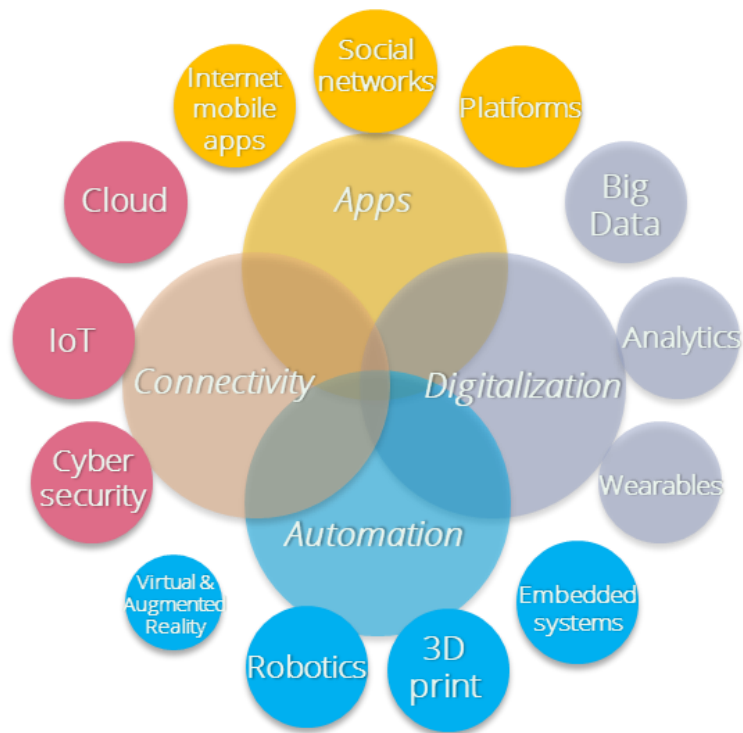
1. Business strategy
2. Processes
3. Products and / or Services
4. People
5. Infrastructure.

Each dimension is detailed in various key work areas to help companies to reach digital transformation.

Digital transformation is achieved through technology enablers widely known in market:

Tech Enablers

This framework is intended to offer a **holistic** vision of company areas and its challenges, linking these challenges with the enablers necessary for its transformation.

Business Strategy

- Cover business strategy and end-goal model for Industry 4.0

Processes

- Describe Industry 4.0 processes

Infrastructure

- Includes physical and digital infrastructures

Products – Services

- Industry 4.0 characteristics of products and services

People

- Defines personnel training and reorganization

In the vertiginous acceleration of digital transformation, the holistic framework approach becomes increasingly relevant. Manufacturers, sometimes, miss or forget to link these 5 dimensions and their corresponding components with business end-goal strategies, thus, failing in their attempts to digitalize even when they prioritize investments based on their own specific objectives. This vertiginous situation conduces everyone to implement digital transformation 'no matter how', but in fact, there is still an alarming gap between digital ambition and real execution, conducting teams to a sense of frustration, because they don't see results.

Digital transformation is a vehicle, not a destination

Since digital transformation is a vehicle, not a destination; let's approach it from a practical standpoint, starting with understanding customer challenges and working together with users to define problems, ideate solutions, show prototypes and evaluate customer testing solutions. All of these steps validate if the Digital Strategy is aligned with Business end-goals.

"Road to align Digital strategy with Business end goal"
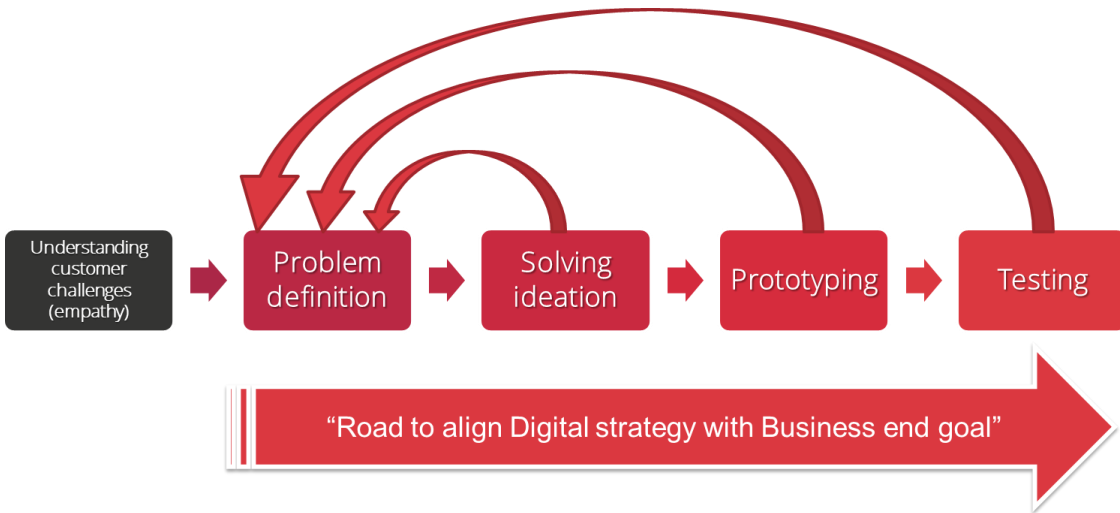
may invest a lot of time and energy only to receive unexpected or undesired results.

Goals

Goals need to be realistic, otherwise, opposition debate could dominate, and goals will be ignored or not applied. Realistic means:

Actionable

Low effort, not low courage

Immediate, short term action, otherwise it is just an inclination

Visible

Induce an emotional reaction; humans change for emotional reasons not analytical

Goals need to be clear and accountable. When teams have clear objectives, typical comments such as, '*no one knows why they are transforming*', or '*what is and isn't changing*', or '*what's it for*', disappear. Without clear goals, groups face ´chronic fatigue syndrome´.

Goals answer why are we doing what we are doing.

To construct a goal, management needs to address:

1. We are going from this

2. We are going to this

3. Because of this

Principles

Principles are rules or guidelines that provide clear, direction and express the values of an organization.

Principles prevent people from having to improvise.

Principles need to be known by the entire organization.

Principles guide action, when people follow principles instead of rigid structures (difficult to adapt or change) goals are easier to accomplish.

- Principles help people choose between alternatives, to make decisions; without principles, company risk chaos, no coherence, no signpost, some people will go left others will go right.

- Principles help mid-leadership to stand on the enterprise values when the CEO is absent. No matter how much money a company invests in digitalization technology, it won't lead to results without principles or goals.

- Principles need to be coherent with an organization's end-goals, therefore principles need to be specific to each company, to each organization, to each industry.

Technology

Avoid the illusion of being digital, only because you are doing digital, doing and being are not the same, being means applying real internal changes to businesses. Technology must be useful.

A roadmap to define specific technology for specific problems will help customers avoid implementing unnecessary tools and to create new problems. The same technology tool does not necessarily have to apply to all problems.

When tailoring a solution per each scenario and necessity, functional analysis together with the 16 drivers and 5 dimensions helps define the Digitalization Roadmap. This document is useful to avoid wasting valuable resources, for example, a talented team could waste tremendous effort with isolated initiatives and isolated investments. One Digitalization Roadmap will also prevent different teams from implementing non-standard technologies within the same company.

Achieving goals in 5 steps

To achieve defined goals, teams need to understand how to enter into the ideation process (generate, develop and communicate new ideas) to acquire **knowledge**, without falling into an excess of confidence. But even with knowledge, teams may fail. Then it is important to lean on **experience**, experience applies to each situation, no one else can experiment for you, experience cannot be copied, experience must be lived, and this takes time. But not everything can be solved with only knowledge and experience, sometimes teams will encounter unforeseen cases and will have to improvise. **Imagination** will serve a team in these situations, thinking in a disruptive way, out of the box, without paradigms or prejudices. One of the most determinant steps that influences direct performance and team action results is **attitude**. Even with a good attitude, teams may fail, and teams will need to insist, to persevere, to push, to persevere and to insist again, in other words, teams must be very **disciplined** because fortune will not always be on the side of the team.

Conclusions

Fourth industrial revolution or Industry 4.0 demands people to be more trained and specialized than ever before. CIOs and other executives will choose to replace humans in tasks where automaton is much more efficient. In this scenario, industry needs a holistic approach to digital transformation, which covers business end-goal and technologies from micro to macro point of view.

Digital transformation it not only about technologies in and of itself, it is also a change of mentality, in other words, technology is not self-sufficient, it needs guidelines, rules and clear organizational business goals to drive it forward.

Holistic integration of all 16 drivers and business end goals is a big issue that industry must think about since the cost of technological lag is immense. The 5-step ladder can be helpful to achieve this integration.

In conclusion, defining **business end-goals** and the cost / benefit of applying certain **digital technologies**, as well as the digitalization **roadmap** to follow through a digital transformation plan, are key to guarantee success for steel producers to achieve industry 4.0 and the digital factory of the future.