

POLITECNICO DI TORINO

Professor: Cantamessa Student: Matin Mivechian Student number: S236461 Engineering Management Department I would like to dedicate this work to my dear family, which their love is the best support and their happiness, the highest motivation, in my life.

&

I want to thank all professors of my course in Polytechnic of Turin, specially Prof. Cantamessa for his professional guidelines which enlightened this work.

Matin Mivechian

((Country Digital Program))

Table of Contents

Brief Summary	5
Part 1	7
Description of the company	7
ABB	7
Canvas business model and competencies	8
Sector's challenges and the strategy	9
Competition	
ABB Ability™	
Description of the Country Digital Program	14
Mapping of Program and Projects	15
Costumer Experience Workshop Project	16
Problem statement	
Objectives of the project	
Methodology to be used and project plan	
Digital Opportunities Tracking Project	
Problem statement	
Objectives of the project	
Methodology to be used and project plan	
Part 2	20
Description of work done and technical specification for Customer experience workshop	20
Design thinking methodology	20
General architecture for ABB Italy	
Pre/Post Event tasks	
Technical Specification	

Case Study – AST (ACCIAI SPECIALI TERNI) Digital Workshop27
Description of work done and technical specification for digital opportunities/sales tracking
Microsoft Power BI general architecture
The architecture used for ABB solution
Technical specification
Final Result
Part 3
Description of the results achieved, comparison with the objectives stated ex ante for Customer
Experience Workshop48
Possible future directions for Customer Experience Workshop49
Description of the results achieved, comparison with the objectives stated ex ante for Digital
Opportunities Tracking
Possible future directions for Digital Opportunities Tracking52
References

Brief Summary

This work is a report of my contribution and the results I have achieved during the curricular internship in ABB as Country Digital Program Intern.

ABB is a Swiss-Swedish multinational corporation headquartered in Zurich, Switzerland, operating mainly in robotics, power, heavy electrical equipment, and automation technology areas. ABB and its customer's industry are experiencing a rapid evolution, caused by recent disruptive innovations which formed 4th industrial revolution. To address the changes required by this trend and taking advantage of its opportunities. ABB has introduced a new trademark called ABB Ability, which is focused in design, development and lunch of digital solutions which could involve different products of ABB and other partners.

In a broader view to reinforce digital competences of ABB Ability, ABB has lunched the initiative called "**Country Digital Program**" which includes multiple complex projects inside. These projects were addressing Sales, HR, Partnership and R&D areas. In Sales area there were 4 main projects, naming customer experience workshop, tracking Digital sales & opportunities, training salesmen, finding potential customers among which I took charge of the first two which will be described in the following.

Regarding **Customer Experience Workshop**, the problem was that most of clients were not aware that what/how new digital technologies, not as one product or device but as a complex combination of them, could serve them. The objective was to clarify these potential outcomes in an effective and short manner. To do so, I have proposed taking advantage of "Design Thinking Methodology" and while keeping in place the principles of the method, I have customized and assigned different tools based on ABB's conditions and objectives. The proposal was approved, and ABB lunched this initiative by holding couple of workshops with key customers during which in the course of 5 to 6 hours 2/3 or more parties could explain their problems or competences, filter the issues based on importance and difficulty, then brainstorm and come up with all possible solutions and at the end filter solutions and define the final elected solutions as projects to be done. Currently I'm working on the project which was the result of our first workshop.

Regarding **Tracking Digital Sales & Opportunities**, the problem was the ambiguity ABB was facing to define and track amount of digital sales out of digital solutions/projects which were not necessarily made fully out of digital products or services. The objective of this project was to find a way to put together all different types of report coming from different business units for digital sales and giving a big and comparative picture of their progress, sharing the most accurate practice in digital definition and possibly make dashboards to track the progress. To deal with fickleness and difficulty of measuring a complex sales process such as this one, I took advantage of Microsoft Power BI, a business intelligence application which was letting me to merge and edit diverse inputs, make real-time connection with data on the cloud and make my own customized Apps and dashboards. Doing so, I have succeeded to present digital sales of ABB Italy as a whole and make dashboards which were uniquely designed for different users/business units letting them to tack their progress with more detailed data.

Part 1

Description of the company

ABB

ABB (ASEA Brown Boveri) is a Swiss-Swedish multinational corporation headquartered in Zurich, Switzerland, operating mainly in robotics, power, heavy electrical equipment, and automation technology areas. It is ranked 341st in the Fortune Global 500 list of 2018 and has been a global Fortune 500 company for 24 years.

ABB is traded on the SIX Swiss Exchange in Zürich, Nasdaq Stockholm and the New York Stock Exchange in the United States. It is a pioneering technology leader with a comprehensive offering for digital industries. ABB operates in more than 100 countries with about 140,000 employees.



With a history of innovation spanning more than 130 years, ABB is today a leader in digital industries with four customer-focused, globally leading businesses: Electrification, Industrial Automation, Motion, and Robotics & Discrete Automation, supported by its common ABB Ability[™] digital platform. ABB's market-leading Power Grids business will be divested to Hitachi in 2020.

Electrification Products	Industrial Automation	Robotics and Motion		
Integration of all ABB LV/HV activities Innovation, e.g. home automation, smart products	Integration of all control-based solutions: DCS, PLC/IPC 1	Focused, simplified portfolio Robotics: innovation & customer value leader		
Expansion in growth sectors, e.g. e mobility, renewables, data centers	Leading in digitalization, software and service	Motion (motors & drives) bottoming out, early cycle momentum building		
	Electrification Products Integration of all ABB LV/HV activities Innovation, e.g. home automation, smart products Expansion in growth sectors, e.g. e mobility, renewables, data centers	Electrification ProductsIndustrial AutomationIntegration of all ABB LV/HV activitiesIntegration of all control- based solutions: DCS, PLC/IPC 1Innovation, e.g. home automation, smart productsExpansion, e.g. B&R, PharmaExpansion in growth sectors, e.g. e mobility, renewables, data centersLeading in digitalization, software and service		

Canvas business model and competencies

Canvas business model describes the rationale of how ABB creates, delivers and captures value.

Key Partners	Key Activities	Value Propositions	Customer Brelationship	Customer Segments
 Investors Acquisitions Joint Ventures (Microsoft, Flour and Aibel) OEMs Raw material supplires EPC companies Universities 	 Manufacturing Quality control Engineering services R&D Electrification products Industrial automation Robotics & Motion Cyber Security Software developement Key Resources Operation in more than 100 countries More than 132000 employee with high diversity An installed base of more than 70000 control systems which connects 70 million devices Intellectual properties Technology and facilities Alliances Corporate research centers 	 ABB is pioneering technology leader that is writing the future of industrial digitalization Goods and services which make very efficent industrial operations Robotics, Power and Automation technology areas 	 Dedicated sales for large accounts Customer assistance Patent attached relationship Engineering expertice & Service capabilities Channels EPC companies Website Corporate & regional offices Salesforce Social network Events 	 Utility Industry Transport Infrustructure
	Cost Structure		Revenue	Stream
 Cost of parts and Development an Staff compensati Distribution Software develop New products an Dedication of arc development act research centers 	l components d maintenance of production o on pment id technologies bund 1.5 billion dollar to fund r ivities driven by around 8000 t	 Sale of products (products, Robotic Industrial Automa grid) Service associated Licensing 	Electrification s & Motion, ation and Power	

In the context of industry 4.0 and digitalization, I briefly list ABB's competencies.

ABB's leadership in industrial automation	Innovation	and technology trends
Global #1 in process control software	iot	Internet of things/digitalization
Global #1 in motion	F	
Global #2 in robotics, #1 in China	A	Robotics
Innovation & growth leader in machine and factory automation	Δ	3D printing
Large installed base incl. motion. robotics. process	°°°°°°°°°°	Blockchain
control systems	(Friday)	
ABB Ability TM —leading industrial solutions		Artificial intelligence
	I	

These competencies would be amplified by receiving data from 70 million installed-base data and the

deep know-how of ABB's expertise.

Sector's challenges and the strategy

Every industrial revolution brings a lot of opportunities and risks to be faced; in this regard the current one is not an exception. In the graph below we see how ABB is presenting the trend and maturity of digitalization in its common customer's industries.



Resource: ABB internal_ depiction of digitalization trend on whole industry and particularly ABB's end-markets.

ABB is carefully monitoring this potential market and has well-calculated estimations on the potential value and demand to be served.



Disruptive technologies will have substantial impact by 2025 (economic impact of 12 most significant technologies, \$ trillions, annual)

Resource: ABB internal_ prediction of potential market brought by coming disruptive technologies by 2025

To address the coming **radical/Disruptive innovations** in the sector, ABB has designed its own unique portfolio and lunched a specific digital trademark called ABB Ability [™]which is focused in developing digital solutions.

Competition

On the other hand, wherever there is a higher prize, there is more competition too. ABB has its own very strong competitors like Siemens, GE, Schneider, Emerson, etc. In case of economies of scale, some competitors have higher returns in specific areas, but in case of economies of scope, ABB has the highest variety. In case of pricing, ABB is not following price leadership, instead, due to its high-quality products and brand reputation, charges higher prices respect to others. There are a lot of other factors affecting competitive superiority which would be out of scope of this research to investigate.

The table below, taken from ABB's presentation, shows how they picture their business portfolio respect to other incumbents/main competitors.



Resource: ABB internal_ Product/service portfolio and comparison with competitors

ABB Ability™

With the commercial launch of more than 210 solutions and services, ABB is unlocking value for customers in the Fourth Industrial Revolution. By combining ABB's deep domain expertise with network connectivity and the latest digital technologies and innovations, ABB Ability creates powerful solutions and services that solve real business problems and produce tangible business opportunities.

ABB Ability helps customers in utilities, industry, transport and infrastructure develop new processes and advance existing ones by providing insights and optimizing planning and controls for real-time operations. The results can then be fed into control systems to improve key metrics such as factory uptime, speed and yield.

The offering builds on ABB's pioneering technology and more than four decades of industrial digital leadership. It will enhance customers' ability to innovate and compete in the emerging digital-industrial marketplace.

"As a pioneering technology leader in digital solutions, with an installed base of more than 70 million connected devices and 70,000 control systems, ABB is uniquely positioned to support its customers' digital transformation," says ABB CEO Ulrich Spiesshofer. "With ABB Ability, we are combining ABB's entire portfolio of digital solutions and services. We are creating additional customer value by bringing together ABB's domain expertise, advanced connectivity and the latest digital technologies. With this, our customers can achieve unprecedented improvements in operational performance and productivity."

Digital offerings provided by ABB Ability include performance management solutions for assetintensive industries; control systems for process industries; remote monitoring services for robots, motors and machinery; and control solutions for buildings, electric-vehicle charging networks and offshore platforms. Some of the more specialized offerings address energy management for data centers and navigation optimization for maritime shipping fleets, among many others. Customers who are already using the portfolio of digital solutions that are now part of ABB Ability include some of the world's leading utilities, manufacturers and service providers, among them Shell Oil, CenterPoint Energy, Con Edison, BASF, Royal Caribbean, Cargill, Volvo, BMW and many others. ABB Ability's next-generation digital solutions and services are being developed and built on Microsoft's leading Azure cloud platform, based on a strategic partnership with the software company.



ABB Ability[™] solutions & platform

"Building our solutions on the Azure platform means we can take advantage of all of its capabilities and add value with our domain-specific offering," says ABB Chief Digital Officer Guido Jouret. "In effect, we are turning ABB's decades of industrial domain expertise into software offerings that our customers can access through the world's largest and most advanced digital platform. From being a hidden digital champion, we are becoming the partner of choice for customers embarking on a digital transformation. They can now know more, do more, do better, together. We can help them assess, automate, optimize and collaborate." «4»



The solutions designed could be categorized in different types and hierarchical segments that each shows the scope and areas that the solutions would address.

The graph below is taken from ABB Ability brochure which shows exactly different attributes and functionalities of the digital solution. Although here is not mentioned the name of final solution, but final solutions would be addressed based on this graph.

Ability Hierarchy	Solution types	Availability	Productivity	Quality	Safety	Security	T-to-M	OpEx	CapEx
Together									
Advice, transform,	1. Collaborative operations	Х	Х	Х	Х	Х	Х	Х	Х
collaborate, re-think									
		Х		Х		Х	Х	Х	
Do better	3. Performance optimization		Х	Х				Х	Х
Optimize, simulate,	4. Energy optimization		Х					Х	
predict, automate	5. Alarm management	Х	Х	Х	Х	Х		Х	
	6. Cyber security	Х	Х		Х	Х		Х	
	7. Asset health	Х			Х			Х	Х
	8. Predictive maintenance	Х			Х			Х	Х
	9. Lifecycle assessment	Х	Х	Х	Х	Х		Х	Х
	10. Control systems	Х	Х	Х	Х	Х	Х	Х	Х
Do more	11. Virtual training	Х	Х	Х	Х	Х	Х	Х	
Monitor, control,	12. Inspections	Х		Х	Х			Х	Х
secure, manage,	13. Condition monitoring	Х						Х	
apply	14. Emission monitoring		Х	Х	Х			Х	
	15. Data analytics	Х	Х	х	Х	Х	х	Х	Х
	16. Remote assistance	Х	Х	х	х			Х	
	17. Backup management	Х	Х		Х			Х	
Know more Assess, connect, store, inform, measure	18. Data collections								

Resource: ABB Ability brochure_Solutions hierarchy, types and functionalities

Description of the Country Digital Program

This is the name given to the internal program held in ABB in country level, which is aimed to design and run projects that increase digital competency and ability of ABB.

The projects are assigned for different divisions and functions which you can see below. My stand in this program was to be in direct cooperation with Mauro Martis, head (lead) of Country Digital Program and LBU manager for IAPI which stands for Industrial Automation-Process Industries in Italy.

Therefore, I had the leverage to participate in PMO meetings and projects related to any scope in the country.

Below you can see organizational matrix structure and the way these projects get designed for different divisions (columns) and functions (rows).



	EP DIVISION	IA DIVISION	PG DIVISION	RM DIVISION
	P. Baroncelli/D.Colombo	PV. Rebba	A. Bueti	A. Pueroni
<u>Business progress –</u> <u>KPIs and tracking tools</u>	Focus on "Ability" solutions Extract opportunities data from SFDC/Actual data from SAP Track EDCS development plan	Tool to combine tasks and planning Track actual and opportunities from SFDC and external sources (IATU, IAMF)	• No specific needs for the time being	• Focus on Condition monitoring solutions (for Drives, Motors, Robots). Expand install base
<u>Go to market</u>	Specific events are planned to present ABB portfolio to specific targets (e.g. energy managers). Necessity to spread digital culture.	Focus on specific portfolio solutions Exploit customer with service contract. Some Cross-Bus initiative	 Ability solution as enablers of traditional business (e.g. CoC plan for PGHV) Focus on new business model 	 Focus on customer with service contract. Preparation of dedicated marketing material
How to beat competition	 New stakeholders emerging, e.g. end users and energy managers, as well as new, competitors (small firms, consultants). 	Limited knowledge on competitors Pain points collection on Power and Water marketthrough ARC survey Scheduled 2 meetings on Asset mgmt and Cyber Security	Limited knowledge on competitors move	ABB RM Frontrunner in terms of solutions; importance to get experience on the field
Success cases and communication plan	Coordinate with EP Communications Collect success cases ongoing (Aruba; Pacaro).	Collect LBU's digital portfolio and strategies - on going. Specific action with all LBUs to collect succes cases planned	No events are planned in Q4 2018 Verification of success cases on going	 Aerogravity, Tenova Dalmine and other succes cases in preparation. Idea for Digital maintenance days

ACCOUNT MANAGEMENT	PARTNERSHIPS	SERVICE PORTFOLIO	PEOPLE 4.0	CORPORATE COMMUNICATIONS
P. Leone	A. De Bellis	F. Gaggero	S. Turconi	E. Baruffi/C. Brivio
 Status check on all the Italian *AM Digital player map Potential Engagement Status Next steps Promote at least one Italian Account for Group attention (FCA, Enel?) 	 Organize meetings to follow-up strategic partnerships initiatives: (IBM; Microsoft; HPE; BIP) Ideas to be developed regarding Italian small/medium size enterprises 	 How to exploit current Service contracts to further penetrate with digital solutions. Develop competencies and partnerships to manage the digital solutions that will be implemented (Operation view) 	 Coordinate with Global Digital Competency Lead Coordinate with HRBP to develop LBUs plan 	 Gather success cases from each divisions Need to spread ABB's digital culture/message (e.g. during fairs and events) ABB Digital days

Mapping of Program and Projects

To summarize, ABB Ability is the trademark that ABB has lunched in the market and is particularly dealing with digital solutions addressing demands of fourth industrial revolution.

Country Digital Program is an internal initiative, trying to promote ABB Ability by defining, designing and implementing all required projects in different areas that help to promote ABB Ability.

Th main areas under attention of this program were:

- Research and development (R&D): They are the primary value creators in the company, so there had to be teams of specialists working on developing new digital solutions
- Human resource (HR): There had to be internal digital competence development. To be more specific, beside from generic competence development, the company needed to find the resources who have more awareness and potential in digital area, to assign them to related projects.
- Partnership: This was to make solutions which take advantage from other pioneer companies and engage their technology and offerings in the final solution package.
- Sales: Since most of solutions were not solely a product, but a group of products and services, Before everything salesmen had to be educated about the solutions, then ABB needed some new approach different by the traditional one, that could acknowledge also the costumers about these solutions and at the end there had to be a proper manner to measure these sales.





So out of main 4 projects defined for sales area, I took responsibility to address the followings:

- Costumer Experience Workshop
- **o** Tracking Digital Sales and Opportunities

Costumer Experience Workshop Project

Problem statement

ABB has launched the new trademark "ABB Ability™" which is focused in digital area and is developing a lot of new digital solutions on a monthly basis. Customers are asking ABB for support to evolve while staying competitive as digital transforms every aspect of their industry. Since digitalization is a new trend among ABB costumers, this initiative is aimed at Accelerating ABB's digital journey by partnering with the business to deliver more customer value and to capture more business opportunities and making costumers understand the value that ABB Ability[™] solutions can offer them. On the other hand, ABB would like to take advantage of these workshops to understand better the real needs of each costumer and develop the quality of its solutions.

There are some few ABB Ability[™] costumer experience centers, "ACE", in which costumers from all around the globe can go and visit different ABB digital solutions and have the guidance of expert teams working there. Despite having these centers, there are a lot of costumers who find it difficult to travel so far, for such sessions and prefer the similar service in a local scale.

Thus, ABB encouraged country divisions to design and hold centers and co-creative sessions that help customers to know about different ABB digital solutions and improve the way of interaction with them. In our case, due to the presence and will of one of big and important clients (Steel Plant), ABB Italy was the first country aiming to run such workshop out of ACE centers.

Objectives of the project

While keeping an eye on the package offered on ACE centers, we had to design and customize similar workshops for ABB Italy which:

- ✓ Make the client understand the value of digitalization transformation
- ✓ Change the conversation with customers
- ✓ Accelerate growth with ABB Ability[™]
- ✓ Promote ABB Ability[™] awareness
- ✓ Bring customized solutions in a short period of time (couple of days)
- ✓ Let costumers see closely the changes brought by ABB solutions
- Make co-creation solutions to improve customers' business drivers such as productivity, quality and safety
- ✓ Prototype, test and estimate the impact of digital solution

Methodology to be used and project plan

Mauro as country digital program leader, assigned a core team, made of 3 persons to run the project. Among these three, he himself was the head/project manager, I was responsible to work on the methodology and my colleague Clarissa was in charge of communications. To me, since such a workshop required an intimate conversation among attendees and had to lead to creative solutions, I thought these requirements could perfectly fit with <u>Design Thinking</u> <u>Methodology</u>. For the location, ABB's own production lines were seeming the best options, because they both had salons, meeting rooms to hold the meeting and installed ABB Ability[™] solutions that customer could easily see the way these solutions improved ABB's production.

These suggestions got the primary approval by Mauro Martis and the project literally started. In part 2, you'll see much more in detail of the work done.

Digital Opportunities Tracking Project

Problem statement

By defining ABB Ability[™] and digital solutions, there has been always ambiguity on how to track opportunities and sales related to these products or services. There are 4 main divisions, and each has several business units which differ on the way they track these data. The reason is, type of solutions that some BUs (business units) offer is more product based, while for others are more service based or a mixture of digital and normal products. ABB has defined three method to label opportunities as digital: 1- product tree (in which some product groups are defined as digital) 2- Campaigns (in which different campaigns are defined on salesforce as digital) 3- ?????. Among these methods, different BUs chose the one that better suits them and some follow none of them and report manually through excel.

Up until now there is not a united method or manner to follow, thus it's not possible to have a general view on digital data and compare BUs turnover. This situation was really bothering, especially for the top managers (e.g. division or country managers) who wanted to have a clear picture about their digital initiatives and report to their supervisors. Mr. Martis as the head of country digital program defined this project in order to potentially solve all these issues.

Objectives of the project

The purpose of this project is to:

- ✓ Extract the data for sales and opportunities related to digital solutions
- ✓ Design dashboards that are easy to use and understand that enable users in decision making
- ✓ Provide dashboards with high availability for different business units
- ✓ Address the right data to right people, considering hierarchy and confidentiality of data

Methodology to be used and project plan

The nature of this project was about interacting with big data, making reports/dashboards and sharing them. For the current scope of this project, I was looking for a "Software as Service (SaaS)" solution, using cloud computing. They are the most efficient and economic options available that even give the possibility to use them as "Platform as service (PaaS)" which could be useful for bigger scopes of this project, where I could develop and design a software or dashboard for an external user/client. there are couple of well-known applications to do this job.



Among the possible applications, Microsoft has the closest partnership with ABB and its Power BI is the one which is getting more and more used by other ABB colleagues and solutions. All these have led me and Mr. Martis to be more interested to choose Microsoft Power BI.

Part 2

Description of work done and technical specification for Customer experience workshop

Design thinking methodology

Design Thinking is a design methodology that provides a solution-based approach to solving problems. It's extremely useful in tackling complex problems that are ill-defined or unknown, by understanding the human needs involved, by re-framing the problem in human-centric ways, by creating many ideas in brainstorming sessions, and by adopting a hands-on approach in prototyping and testing. Understanding these five stages of Design Thinking will empower anyone to apply the Design Thinking methods in order to solve complex problems that occur around us — in our companies, in our countries, and even on the scale of our planet.

Depending on the Schools or organizations you could see differences on the way the stages of this method are defined and applied but mostly it consists of 5 phases—Empathize, Define, Ideate, Prototype and Test.

It's important to note these stages are *not* always sequential and designers can often run the stages in parallel, out of order and repeat them in an iterative fashion.

The various stages of design thinking should be understood as different modes which contribute to the entire design project, rather than sequential steps. The ultimate goal throughout it, is to derive as deep an understanding of the product and its users as possible.



Below you can see different common types.



Stage 1: Empathize—Research Your Users' Needs

The first stage of the design thinking process allows you to gain an empathetic understanding of the problem you're trying to solve, typically through user research. Empathy is crucial to a human-centered design process like design thinking because it allows you to set aside your own assumptions about the world and gain real insight into users and their needs.

Stage 2: Define—State Your Users' Needs and Problems

In the Define stage, you accumulate the information you created and gathered during the Empathize stage. You analyze your observations and synthesize them to define the core problems you and your team have identified so far. You should always seek to define the problem statement in a human-centered manner as you do this.

Stage 3: Ideate—Challenge Assumptions and Create Ideas

Designers are ready to generate ideas as they reach the third stage of design thinking. The solid background of knowledge from the first two phases means you can start to "think outside the box", look for alternative ways to view the problem and identify innovative solutions to the problem statement you've created.

Stage 4: Prototype—Start to Create Solutions

This is an experimental phase, and the aim is to identify the best possible solution for each of the problems identified during the first three stages. Design teams will produce a number of inexpensive, scaled-down versions of the product (or specific features found within the product) to investigate the problem solutions generated in the previous stage.

Stage 5: Test—Try Your Solutions Out

Designers or evaluators rigorously test the complete product using the best solutions identified in the Prototype phase. This is the final phase of the model but, in an iterative process such as design thinking, the results generated are often used to *redefine* one or more further problems. Designers can then choose to return to previous stages in the process to make further iterations, alterations and refinements to rule out alternative solutions.

General architecture for ABB Italy

In case of ABB, I had to consider that it's not an educational/training center that customer/ABB are willing to hold several meetings and spend a lot of time to collaborate, neither a start-up company that is willing to design totally new solutions for every customer. As reflected in the objectives of this project, a big part of attention is toward making customers understand how ABB Ability pre-designed solutions can address their problems, although there is and has been some level of product customization for each customer. After careful study of this methodology and considering ABB and the customer's specific needs, limitations and goals, and keeping contact with ACE centers, I have come up with a general architecture including four main stage.



At first stage, named FRAME, both parties were encouraged to make speeches about themselves, which was preferably in a SWOT analysis manner for customer. This was giving the chance that the parties understand each other better and at the same time, I wanted that this phase help everybody to write down and frame possible problems.

In the next stage, named FOCUS, all those generated problems had to be prioritized and filtered to make it possible to work on the most important ones and not waste a lot of time.

The third stage, EXPLORE, was dedicated to exploring possible generic solutions and electing the most appropriate ones to be applied.

At the end people are supposed to come up with more comprehensive and detailed solutions. This stage would be done partially, since the implementation and test of the solution would be out of the scope of this workshop – or at least the first workshop – and it would be postponed to next meetings.

The proposed general architecture was agreed with all team members and now it was the time to develop more details and technical aspects.

Pre/Post Event tasks

To be more practical we decided to divide the activities to three categories: Pre event – Event – Post event

Since the activities related to pre/post event are not technical and were more concerned with communication, which was my colleague's responsibility, I will mention them briefly here and then go through the event's core activities.

Pre event

- Align on language for meeting and for event
- Inform about ACE process & possible outcomes (ACE Reach out pack)
- Fill canvas on Context, Opportunities, Business drivers and Expectations
- Define "Customer challenge" and event expectations (What "Success" looks like)
- Identify ABB internal capabilities and roles required before and for the event
- Discuss material and data relevant to prepare the event (from Customer or ABB)
- Inform about photo/video capture of people and artefacts
- Align on Engagement Format
- Align on Participants
- Align on Date
- Decide on future engagement mode (touchpoints and points of contact)

Post Event

- Preparing outcome package
- Sending feedback letter (NPS form)
- Preparing a more technical draft of possible solutions that you came up with
- Keeping contact with the customer for potential next meetings

Event

Below you'll see different tools and activities that we have designed to do during the event.

I'll present them in consistent with general architecture sequence.

Technical Specification

For each stage of the event architecture, there could be different tools used. After explaining and discussing these tools with team leader (Mauro), based on time constraint and difficulty of each tool, he chose some of them to be used in our workshops.

Here in the graph you can see all possible tools, but I will go through the ones that we have used in our workshops which are shown bold in the graph.

It's important to know that depending on time and the type of workshop, some of these tools can be used in other stages or be repeated too.



Frame

Magnet Speech: Representatives of each company make a brief speech (20 minutes) about the topics mentioned in agenda. These speeches are the basis for the whole workshop and the spokesmen should transfer as much as possible information to inspire audience.

Outcome: Providing the basis of information to inspire attendees. (input of the workshop).

How Might We: While listening to Magnet Speeches, each participant should try to come up with 2 "How might we...?" questions and writes the questions on his/her post-it. (e.g. How might we overcome low customer satisfaction?)

When Magnet Speeches are over, one by one participants step forward and introduce their questions and place them on the whiteboard. At the end with the help of facilitator, the questions go into proper clusters and these clusters form the categories of next step (what's on your Radar).

Outcome:

_To concisely and provocatively restate a challenge in a way that invites a broad range of solutions.

_To prepare for further ideation based on research and existing knowledge. Reaching a graphic representation of clustered thoughts.

_To focus on more common and important demands.

Focus

How Might We/ What's on your Radar (election): To filter and focus on the more important problems/solutions, after clustering (categorizing) them, people will vote to ones with higher importance in their opinion.

Outcome: Leading the attention and effort to the problems/solutions that are more important and relevant based on all group's opinion.

Explore

What's on your Radar: Here we divide the participants into 2 groups, one with dominant technical background and the other with dominant organizational background. Based on previous step, we define the categories (slices) of the radars for each group, and the members of the groups considering the categories of interest, write down top-of mind thoughts & solutions, one item per post-it.

Then we collect all thoughts outside the radar. Afterwards, each person introduces his/her thoughts on post-its and puts them into the radar sorted by importance: center is most important.

Finally, we have the election of solutions for each group separately.

Outcome:

_To Exploring potential solutions and filtering less relevant ones.

_ To contribute and prioritize insights across areas of interests

Evaluate

Impact/Difficulty Analysis: While keeping two groups separate, we gather your solutions so that you can see all at once. We select the item with the most and least potential impact and place them at the rightmost and leftmost end of the x-axis. Distribute between those two anchors all other notes, one-by-one, evenly spaced according to relative impact. We will follow the same procedure for relative difficulty on the y-axis.

Outcome:

_To prioritize a collection of things ideas by allocating relative impact and relative difficulty.

_To help the team decide what to focus on going forward.

Concept Poster: Finally, here we will make 6-7 groups which work on 6-7 elite solutions in more details. The fields inside concept poster, lead groups to make the solutions more mature and presentable. Each team has 45 minutes to work on its concept. After a short break the concepts should be presented for everybody, 5 min each, then evaluating and challenging them, 3 min each. The mindset of each group should be to convince other groups to invest on their concept. In the next

phase, all participants will vote to the presented concepts and hopefully we achieve the intended output of the workshop.

Then remains planning for the next steps and possible agreements.

Outcome:

_To lead groups for a better preparation of potential solutions.

_To force groups to take the activity serious by mean of making competition.

_To finish the workshop with mature solutions which are presentable for others.

Case Study – AST (ACCIAI SPECIALI TERNI) Digital Workshop

On June 4th, 2019 a co-creation workshop has been organized in Santa Palomba (Rome) between AST, P4I and ABB, with the objective to support AST in designing the Smart Plant of the future. Customer's main challenge was "How might we shape our Smart Plant of the future", in order to Improve production quality, minimize downtimes and production loss, save energy, maximizing assets investment returns?

The joint team, through a structured design thinking methodology and a context analysis, has identified some specific area of interest, generating concrete ideas and concepts that could accelerate the Digital Transformation in AST. These concepts have led to different work streams both in technical (Remote Control Room, Processing Lines Analyzer and Asset Manager) and organizational/competences aspects to be followed by AST and P4I.

ABB was the technical consultant and P4I was the organizational consultant.

Phase 1: FRAME - Understand context and boundaries

• *"Magnet speaker"*: AST ABB and P4I, each one presented their presentations with a focus on competences that they have around t



Phase 2: FOCUS – Identify and align on the main areas of interest

• *"How might we...?":* starting from the identified and selected categories, we asked ourselves what are the challenges that we see? What are the doubts that we have?

Identified clusters/categories:

_Organization _Learning & Development/Competencies _Production _Maintenance _Others





Phase 3: EXPLORE – Generate and prioritize ideas and options



• "What's on your radar?": we discussed together about clustering and prioritization

Phase 4: EVALUATE – Prioritize actions

• *"Impact-difficulty analysis":* Evaluation of the impact/difficulty for finalizing selected ideas, considering the "problem statement".



Phase 4: Evaluate – prototyping ideas

• "Concept posters": To develop, depict, and share ideas for critique and to gain advocates.



Some impressions from the event...



Digital transformation roadmap





It's relevant to mention that as a result of this workshop and the contract signed between ABB and AST, they have chosen me to be ABB's interface on customer's site for this project and I will be transferred to Terni for at least 6 months.

Description of work done and technical specification for digital opportunities/sales tracking

Microsoft Power BI general architecture

Power BI is a business analytics service by Microsoft. It aims to provide interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards.

The service is made of two important parts. One is on-premise or offline service which is called Power BI desktop and the other one is online or cloud service, called Power BI service.

Power BI Desktop is an application that you can easily download and install it on your PC for free. The functionality of this app is to receive different types of big data stored on-premise and to make reports out of them. These reports cannot be visited online and only the people who have this application can transfer and run the file of the report on their PC.

On the other side, Power Bi Service is an online app/service offered on <u>https://app.powerbi.com/home</u> that requires a Microsoft account to log-in. Through this service you can connect to big data on the cloud and on-premise and make reports and dashboards. You can make workplaces that let you add others and collaborate online with them to edit reports/dashboards, also sharing the final dashboards as a link with anybody that has an account on the website.

The usual approach is to make primary reports on Power BI desktop which offers a better and faster environment and publish them on Power BI service and from there collaborate with others and make final dashboards that are ready to be shared.

These dashboards could be viewed on Power BI Mobile App, which a third important part of this solution.

Below you see a simplified graph of the architecture that I have briefly described.



The architecture used for ABB solution

On the graph below, you see part of different types of data and their flow to the final dashboards.

At first through this graph I will explain about the types of data I had to use.



- Salesforce is a cloud-based customer relationship management (CRM) software that ABB takes advantage in sales area. The software lets you tailor and extract the data and export them as an Excel file. There is also the possibility to connect Salesforce and Power BI to each other and have the real time data, but it needs Power BI gateway which is for paying.
- 2. ABB has defined different characteristics to define an opportunity as digital opportunities, while in Salesforce to label these digital opportunities you have to follow some other methodologies, but as I have mentioned, since these methods were not yet opted by everybody or all business units, some business units were preferring to report their digital opportunities through excel tables.
- 3. For making different types of dashboards/reports, sometimes I needed some information that were not inserted in Salesforce, but some other applications like SAP. For this case I had the possibility to connect to some on premise historian data stored in SQL format.

Technical specification

At first, let's go deeper regarding organizational structure and its hierarchy. The graph designed below shows the parts that I was dealing with, in the country scope.



In ABB, we can see a good level of decentralization in decision making, therefore each of these main divisions have their own liberty to choose the way to report about their digital activities and the level our team could practice its power toward them, was to recommend /suggest the best method.

In the coming paragraphs I will explain about the methods that was suiting different business units/lines and the difficulties we had to put them together.

Power Grids (PG) was waiting to be totally transferred to Hitachi, so there was reluctancy in them to be involved in new projects and orders, also it was not of that much importance for us to push them in this regard.

Robotics and Motion had its own business units, but the way they were reporting was based on number of Robots, Drives and motors that they have installed in their digital projects, not whole project with all services and products sold within and without any financial information. These reports were sent as an Excel table on a monthly basis and regardless of RM business units.

In **Electronic Products**, the data were getting extracted from Salesforce. The difficulty in this case was that they have changed their methodology at 2019 respect to couple of years ago. Before 2019, they were labelling different opportunities by several digital campaigns, but in 2019 they didn't use campaigns anymore, instead based on their opinion and ABB's guidelines, defined digital opportunities in Salesforce and we could extract it any time we needed.

This slight difference in methodology, brings difficulties in reporting that I will mention along with challenges related to other BUs (business units).

And finally, in **Industrial automation**, all business units were using campaign labelling method inside Salesforce, except IAPG and IATU.

IAPG was using product tree method. This method similarly to Robotics and Motion, separates the digital part or product from the rest of project. The difference was that here we could have financial information too and the report was created inside Salesforce, so we had the possibility to have access to the most recent report whenever we desired.

IATU was doing a mix of EP and RM, in the sense that they were defining digital opportunities based on their own knowledge of the project and were reporting them with a different format which was not caring about the financial value of the project.

In this division, along with the project we have faced organizational changes that was going to merge energy related units (IAPG, IACT, IAOG) as one single unit, called IAEN. So now, even if at first, I have made separate dashboards for each of these units, now I had to merge their reports while IAPG had different method.

Beside from these inputs, there was another prepared report in salesforce that was showing all opportunities and their related campaigns.

Now let's take a closer look at the data. There was one standard format of data, including specific predefined columns that could be extracted from Salesforce, through another application called X-Author. The table was called "Opps-Analysis" and included dozens of columns, thus it was the basis for most of my dashboards and it was my preference to make connection between this table and other inputs in one way or the other, to make the final reports/dashboards as unified as possible.

In Power BI, you can connect, merge or append different tables to each other and in general manage their relationship, if there is at least one column in common.



The biggest table (Opps-Analysis) had most of data but not updated information related to opportunity's campaigns and since IAPI, IAMA, IAMP, IACT, IAOG were using campaign method, I just needed to connect these two tables (in a two directional filtering manner).Regarding IAPG, data related to opportunity owners, product group etc. was missing in its report that after connecting to Opps-Analysis I could have access to them.

As you see in the photo, there are not any more connections between tables, instead there is a table called IAEP. IAEP is the table that I have made to address the integration of data between divisions, IA and EP (not RM because their data was far different and not applicable to other divisions and not PG because they were out of the scope of this project). To do it, I have chosen some main columns of each table that shows the general outcome of each BU, not considering name of opportunities and costumer account, then renamed the name of columns to be unified and at the end merged them together. Here I won't go to the conversion details of each BU, but it's important to notice that through table shown below, I could share a generic picture of how all IA and EP business units were working in digital sales area.

ABB Sales Stage	Year 💌	Quarter	- Me	onth	- Day	-	Business Unit (ABB Location)	Opportunity Value USD 🚽
Opportunity Pursuit	2020	Qtr 4	De	cember	*	14	IAMA	4457970
1-Won	2018	Qtr 2	Jur	ne		29	IAEN	2054965,8
1-Won	2018	Qtr 4	De	cember		21	IAEN	1778315,91
Prospecting	2019	Qtr 2	Jur	ne		28	IAEN	1669392,45
1-Won	2018	Qtr 4	Oc	tober		18	IAEN	1501632
Bidding	2019	Qtr 4	Oc	tober		31	IAEN	1325320,5
Prospecting	2019	Qtr 3	Jul	y		1	IAEN	1172850
1-Won	2019	Qtr 1	Fel	oruary		28	IAEN	1066573,78
Prospecting	2019	Qtr 1	Ma	rch		31	EPSU*	1000000
Bidding	2019	Qtr 2	Ma	y		30	IAEN	967601,25
1-Won	2019	Qtr 1	Ma	rch		28	IAEN	879637,5
1-Won	2018	Qtr 2	Jur	ne		28	IAEN	861432,31
Prospecting	2019	Qtr 4	De	cember		31	IAMA	844668
Bidding	2019	Qtr 2	Ma	y		31	EPSU*	835484
2-Negotiation	2019	Qtr 2	Ma	Y		15	IAMP	826660,1475
Prospecting	2019	Qtr 4	De	cember		31	IAEN	715438,5
1-Won	2018	Qtr 2	Ар	ril		13	IAEN	713275,2
1-Won	2018	Qtr 2	Jur	ne		29	IAMA	703890
Bidding	2019	Qtr 3	Se	otembe	r	30	IAEN	635378,04
1-Won	2018	Qtr 4	No	vember	3 0	29	IAEN	629336,32
1-Won	2018	Qtr 3	Jul	y		31	IAEN	620596,35
Opportunity Pursuit	2020	Qtr 1	Ma	rch		31	IAEN	610038
Bidding	2019	Qtr 2	Ар	ril		30	IAPI	586575
Opportunity Pursuit	2019	Qtr 2	Jur	ne		14	IAEN	586575
Opportunity Pursuit	2019	Qtr 2	Jur	ne		19	IAEN	586425
Prospecting	2019	Qtr 2	Jur	ne		30	IAEN	574696,5
Bidding	2019	Qtr 2	Ар	ril		30	EPSU*	574695
Ridding	2010	Otr 2	0.4-2	w.		20	IADI	572/07 2

Reports Hierarchy

Although Mr. Martis had the privilege to have access to the data of other BUs rather than his own (IAPI) due to his second role as Country digital lead, but other BUs must not have access to each other's data for security and internal competition reasons. At the same time, it was important to acknowledge each BU of how they are doing respect to others, in their division or whole ABB Italy.

For this purpose, I decided to make different workspaces on Power BI based on the final users and their access limit. One workspace was generic, and everybody could see it (ABB Digital Italy) and some others for each BU, that in addition to generic report, was including financial details for them and at the end one confidential one that was made for Mr. Martis and people higher than him in hierarchy (ABB Digital Confidential). So different Power BI Desktop files were published in respective Workspaces in Power BI Service.

Workspaces are the first place to send the data from on-premise to the cloud, or better on internet and in this case Power BI Service which is a SaaS. On workspaces, similar to Power BI Desktop, you can create reports and use some additional online tools like R or data analytics and world map, but more importantly is the possibility to add other people there and work together on the report.



Power BI Service Environment

You have seen workspaces, as the entrance to the Power BI Service. Now let's take a closer look to the process that took place inside this service.

:		ower Bl	ABB Digital confidential				🦲 New	look on 📮 🛞	⊻ ?	ی
=	=						+ Create	$e \equiv$ List view \vee	🕑 Update app	
G) Home		Q Search content							
¢ C	7 Favorites) Recent	>	Dashboards Reports	orkbook Datasets Dataflows					Showir	ng 22 items
	Apps		NAME 个		ENDORSEMENT	ACTIONS	REFRESHED	NEXT REFRESH	API ACCESS	
Ŕ	Shared with me		ABB Digital Italy			雌 ♡ ♫ ≪ …	02/04/2019 14:37:07	N/A		^
C	Workspaces	>	EP Digital Italy			uti () ⊑ ∝° …	07/06/2019 15:30:02	N/A	1771	
~	ABB Digital confid		IA digital			alį () ⊑ ∝₀ …	21/02/2019 13:49:15	N/A		
			IA digital 12-03			uti () [] ∝° …	15/03/2019 15:55:02	N/A		
			IA digital 19-03			4 ℃ ⊑ ∝ …	01/04/2019 13:35:01	N/A		
			IA digital 22-02			d ŧ () [] ∝ª …	22/02/2019 13:17:05	N/A		
			IA digital 25-02			4 ℃ □ ≪ …	25/02/2019 15:29:19	N/A	1200	
			IA digital 26-02			₩ \) 💭 🗠 …	27/02/2019 09:25:47	N/A	1001	
			IA-EP Digital Italy			alį () 💭 ∝e …	07/06/2019 15:24:39	N/A		

As an instance I have chosen <u>ABB Digital Confidential</u> among workspaces and you can see all <u>datasets</u> that have been uploaded there. After providing datasets, the next step would be making <u>reports</u> out of them and after reports is <u>dashboard</u>'s turn. The difference between reports and dashboards is that a dashboard is made on top of reports, by pinning different graphs from different reports in one dashboard.

The ultimate step to widespread a dashboard is to register it as an App. Tab of Apps is available for everybody and it's like a marketplace environment that you can easily search among vast variety of Apps which are registered from your organization or out of it/worldwide.



After going through whole architecture and process, it's time to look at the final outcomes, for a better understanding and easier discussion on details.

Final Result

You have seen one Workspace and the datasets inside, now by sequence let's take a look at a sample report.General saying, I have tried to demonstrate data related to "Sales Stage", "Product Group", "Expected award Date", "Customer Name", "Opportunity Name", "Opportunity Value", "Op

III ABB Power BI	ABB Digital confidential	ABB Digital confi > IAEN Digital Italy	IAEN Digital Italy	Data updated 07/06/19 🗸		🛑 New look on 🕴 🛞	± ? © (
=		Export 🗸 🖻 Share 🖾 Subscribe 🛱 Commen	ts 🛧 Favorite …			🤊 Reset to default	🛛 Bookmarks 🗸 View
⇔ Home	Q Search content	IACT					
☆ Favorites >		IAPG					
Recent >	Dashboards Reports Workbooks Dataset					EAD filter	
I ADDS	NAME T	IACT	214	Product Group	(Blank)	2018 2019	2020
eB. Shared with ma		Sales Stage	34				
X Shared with the	내 ☆ EP Digital Italy	Opportunity Pursuit		100		Sales stage filter	
🖓 Workspaces >	dt ☆ IA-FP Digital Italy	1-100	Edding 2M		1-Won	Bidding Opportunity Pursuit	Prospecting
ABB Digital confid V	and a set of original rady			5.5M 0.9M			
	Ju 😓 IAFN Digital Italy			0.4M 0.6M		Campaign filter	
		Prospecting	GM	CT Service CT Partners and Projects	IACT Industry	IACT_2020_Partne IACT-Field Service	IACT-Field Service -
	📶 🛧 IAMA Digital Italy	Opportunity Va	alue USD by Year and ABB	Sales Stage			
		ABB Sales Stage @1-Won @Bidding	Opportunity Pursuit Prospecting				
	ah ☆ IAMP Digital Italy	3.58			Account Customer Name	Opportunity Name	Opportunity Value USD
		2 (34			Aq2	OPP-18-2342876-PROCOS-CAMERI-R10 Plant Exnancion	1,173,150.00
	引 ☆ IAPI Digital Italy				A	MES Halcor Inofita	586,575.00
		2.04			Technologies S.p.A.	IACT-17-566938-Aggiornamento Supervisione DCI ad xA	328,482.00
	alı ☆ IATU Digital Italy	1.94			a S.r.L.	IT-Basf-Upgrade 2018 - 800xa	293,287.50
			2.4314		Tecnici S.r.I.	MES SIAD	282,494.52
		1.044			carlo, S.A.	MES IFF	273,343.95
	📶 🖈 RM Digital Italy				A Del Unemicals S.p.A	IAUT-10-047907 BULKA HMI Upgrade	203,958.75
		0.5M 0.93M			ISA.	MES Countan	234 630.00
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				wer S. P. A.	MES Solid Power	187,704.00
	ult ☆ The One	0.0M 2018	2019	2020	Total		

I would like to take advantage of this relatively old photo and explain some points. This report is for when new BU, IAEN, was just introduced and inside we had three separate reports for each BU involved. Later on, I have merged IACT and IAOG, but still there was no way to merge IAPG totally, due to different type of data that they were providing. Although it was done in IA-EP report, which was not concerning the names of opportunities and their details, but only the total amount.

Below you see IACT & IAOG merged, which is also the last format of report prepared for most of BUs.



These reports were letting them track different KPIs or outcomes easily and have a dynamic interaction between all fields without any delay or difficulty (unfortunately here I can't show that feature).

At this stage, for the first time ABB Italy could see the whole picture of Digital Sales state, benchmark and compare different BUs outcome. Below are two key reports that show how it was achieved:



Thus, then, I want to share some other reports of BUs which were using different methodologies, to see how it was affecting type of reports. To be more precise, BUs in which were not reporting based on campaigns, including IAPG, IATU, RM and partially EP (RM & EP are business division, not business units).



For IAPG, difference in the appearance of report is only having "Product Line" instead of Campaigns.



For IATU, as you see there are a lot of items lacking and instead, we have some other items that were of more importance for them, like potential revenue and the location.



In RM, there is a totally different approach. There is no data related to the financial value, but it's only number of installed products that plays an important role.



At the end in EP we see that their methodology change, caused that I couldn't merge the data related to different years and although the interface of 2018/2019 seems the same, the separation had to take place to enable them apply filters on the report.

I have summed these reports in two type of Dashboard interfaces, one for having a quick view and the other for a more official presenting.



1	A		EP	RM
IAPI	IA-EP month	ly comparison	EP Details	
IAMP	IAOG			
IAMA	IAPG			
IATU	IACT			

Similar to a web page that by every click on an embedded link, you get transferred to another page, dashboards give you the possibility to put reports together and interact between them in a much faster way.

These dashboard designs were the first interfaces that users could see through installing Apps on the web page or on their smart phone on Power BI Mobile application.

Regarding Apps, I have made 8 Of them, each one to address a specific user category. The first and most comprehensive one was for Mr. Martis and other top managers in digital program. The second one was for presenting in internal events or to give access to any senior manager who was not directly involved in the program but was interested to have insights about it. The rest were designed for colleagues of different units and divisions to let them analyze and dive deeper in their own data.



Part 3

Description of the results achieved, comparison with the objectives stated ex ante for Customer Experience Workshop

To evaluate the results of this project, I will list the objectives that we have defined before and the colors I assign them shows the level of success to make them as results. dark green would be the best and red, the worst.

✓ Make the client understand the value of digitalization transformation

In concept poster phase we have seen that ABB's guide, customer has designed six concepts from scratch, in which three of them were engineering digital solutions. These solutions were the response to many of their listed problems, which shows their value respect to traditional products or services they have been purchasing.

Change the conversation with customers

This type of tense and co-creational workshop was happening for the first time in ABB Italy. There were not any more one seller and a buyer, but all parties were like development team members.

✓ Accelerate growth with ABB Ability[™]

It's too early to judge about it, but at least from one out of two workshop held with customers, we signed couple of ABB Ability contracts which could be a proof of success.

✓ Promote ABB Ability[™] awareness

Although the points of previous item are valid here too, but in addition this method provided a much better ground for explaining complex digital solutions. This ground is what never a brief meeting between a salesperson and a customer could offer.

Bring customized solutions in a short period of time (couple of days) We have perfectly done it, not even in couple of days, but in couple of hours.

✓ Let costumers see closely the changes brought by ABB solutions

This item was addressed by putting a tour for customer team, as part of the workshop, to visit production sites of ABB which were using ABB Ability solutions or permanent exhibitions which show most of ABB Ability solutions (Customer Experience Centers).

Make co-creation solutions to improve customers' business drivers – such as productivity, quality and safety

Actually, the first project/contract that came out of concepts developed in the workshop and I'm currently working on that, is developing a processing line analyzer for the customer which analyzes real-time and demonstrates all the pain points regarding productivity, quality, etc. and suggests possible actions to take.

Prototype, test and estimate the impact of digital solution

Up until now we couldn't address this item properly, because the solutions we came up with, were mostly very new and talking precisely about their impacts and numbers estimation was very hard.

Possible future directions for Customer Experience Workshop

Regarding the direction of this project, I believe it has reached its maturity and is giving all possible outcomes that I was expecting. I have designed this method as a mean of better communication with customers, and what I had in mind as a direction, was applying it beside from external purposes, to resolve internal challenges. As a matter of fact, after two successful workshops with customers, this method proved itself, and my line manager, Mr. Martis took the lead to apply it to internal issues. Currently we have held two internal workshops with very few modifications on the method, engaging most of business unit colleagues. My line manager as the manager of whole IA division in Italy is totally satisfied with the results and I see that gradually this method and this type of workshops will engage much more colleagues and customers of ABB.

Description of the results achieved, comparison with the objectives stated ex ante for Digital Opportunities Tracking

Let me recall the purposes of this project and check one by one the level of accomplishment.

The purposes stated ex-ante were:

✓ Extract the data for sales and opportunities related to digital solutions:

This factor was done for most of business units; perfectly for those who had followed an instruction in digital definition like all business units in Industrial Automation (IA), but partially for those who neither provided the required data nor a clear definition of digital sales like Power Grid and Robotics & Motion division.

This nature of this issue is due to newness of the initiative and the followed fuzzy environment in early days, that I believe would be solved in an early future when the definition of digital sales is more solid and clear, and the best practices are shared. The instruction and definition of digital is a technical manner out of scope of this team which should be decided by top managers i.e. top-down process.

Design dashboards that are easy to use and understand that enable users in decision making

This goal was fully accomplished, since it was done in an iterative manner, in which every time after designing the dashboard, it was tested by involved users, they were giving their feedback, possible extra features that could serve them and the dashboard was re-customized. This process has led to have different types of dashboards.

To be more specific, you can notice minimal design applied in colors of the dashboard, possibility of filtering effectively, demonstrating only the most important data that they have asked in one single page and still letting users to enlarge and dive deeper in the tables and graphs by clicking on them.



✓ Provide dashboards with high availability for different business units

This item is the one addressed the least but still with highest potential to be improved. The dashboards were available for all BUs in sense of existing but not in sense of accuracy and update of data in a real-time or daily basis. The reason behind, is that most of data used by dashboards were not provided through a direct connection to the SaaS applications but through different files sent by BUs almost once a month.

A possible solution for that, is to use **App Gateways** that would let different SaaS applications to connect and share data with each other. In this case Power BI was used as SaaS and other required data were on Salesforce which is a SaaS and SQL databases which were either SaaS or on-premise and in both case all of them could be interconnected together. I will explain more in future direction section.

✓ Address the right data to right people, considering hierarchy and confidentiality of data

Access limitation was totally met in the project. As explained before for doing so, I had to create different Layers of data based on their confidentiality which were going to different dashboards/apps addressing different BUs or managers.

In this solution giving access permission to people was requiring act of dashboard owners, so although this task was done, but I wanted to make it more automatic. For doing so, the system had to be interconnected to Office365, another SaaS application which holds the data related to people in an organization and all controls all security regulations applied by that organization. This possible solution would be discussed in more details in the coming section.



Possible future directions for Digital Opportunities Tracking

As mentioned before, this project is headed toward real-time and automatic report preparation. To do so, the work in general should be independent to presence of one or more persons. To do so I am planning to take advantage of Microsoft Azure services.

Microsoft Azure (formerly Windows Azure) is a cloud computing service created by Microsoft for building, testing, deploying, and managing applications and services through Microsoft-managed data

centers. It provides software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS) and supports many different programming languages, tools and frameworks, including both Microsoft-specific and third-party software and systems.

At first level, the idea is to integrate and connect some of related SaaS applications through "Active Directory". These applications would be:

- Power BI service which is the final interface and includes data modelling, dashboards and apps.
- Offce 365 which ABB is already using and it possess the information related to employee's position, unit, their level of access to documents i.e. it makes it possible to have user identification and secure access.
- SalesForce, the application dedicated to sales, the source of most of our data including presales (open opportunities), sales and post-sales (customer visit & support).
- SQL Azure and other database, which ABB currently has a hybrid position in the sense that part of data gets stored in SQL Azure on the cloud and other parts on their own databases. In any case there is the possibility of communication among them.

To do so, PowerBI Service gives us the possibility to buy a feature called "App Gateway" that lets us connect to available input applications, and in a regular basis that we can define (e.g. every half an hour) re-reads the input



content and applies the changes. For the access issue, depending to the number of users, either I can personally grant access to specific people or we can give access to the groups pre-defined on Office 365. For example we can easily find a business unit or division membrs like IAPI or IA and give that group the free access to their own specific dashboard.

The reason I still didn't do this job is that currently there are problems on the connection between SalesForce and PowerBI, that my colleagues assured me in early future it would be resolved, and the other problem was that still not all sales people were inserting the data related to Digital Sales in an accurate and structured manner.

For the next and last phase of this project, the possible direction is to go one step further than SaaS and deal with PaaS solutions.



This passage means taking responsibility over development tools, database management, business analytics and operating systems i.e. being able to design a more complex architecture for your application, through comibining all different services that this platform offers.

Below you can see a sample of various services that Microsoft presented on its platform (PaaS) and infrastructure (IaaS).



Each of these services respond to a particular need and general saying, could be assigned to one of following main categories:

Event production, Data Collection, Ingestion, Analytics, Storage, Presentation

Below you see a sample architecture, which shows how services of different categories get together and make a solution:



For being able to use these services and designing an architecture I have taken couple of courses on Azure fundamentals and for the time being the architecture I have designed would be as such:



In this architecture, the data could arrive from a variety of external apps (e.g. SalesForce) or even some random files that we insert (e.g. Excel files). Azure Data Factory lets us to ingest all these different types of data and then sends to Azure Blob Storage for storing, from here depending to the need, we have the option to apply data analysis, otherwise we can just send to Azure Databricks for preparation and then send to PowerBI for final presentation.

I should mention that the solution that currently we are using, is for free, for going to the second phase (Connecting different SaaS apps) we have to pay a few amount for enabling the Gateway, but applying the final phase will cost more, because each of these services are for paying based on how much you use them.

Since the go/kill decision of this last phase is still to be discussed and depends to the number of users, their usage and their expectations, I believe opening and explaining it would be out of scope of this thesis.

References

https://new.abb.com/

https://en.wikipedia.org/wiki/ABB Group#Primary investors

https://vizologi.com/business-strategy-canvas/abb-business-model-canvas/

http://www.abb.com/cawp/seitp202/60ccc1f09ed0c12ac12580f70035bed9.aspx

https://www.interaction-design.org/literature/topics/design-thinking

https://app.powerbi.com/home

labrapidus.stsarabia.com/

http://sienconsulting.com/

https://en.wikipedia.org/wiki/Microsoft Azure

https://pt.slideshare.net/rquintino/the-power-of-now-azure-stream-analytics-microsoft-itproairlift/14

https://en.wikipedia.org/wiki/Microsoft Azure

azure.microsoft.com/

https://www.ntsols.com/news/microsoft-azure-the-cloud-for-modern-business

https://twitter.com/denodo/status/1115229306869956608

https://www.jamesserra.com/archive/2014/09/iaas-paas-and-saas-explained/



Thank you.

Matin Mivechian

March 2020