

CORPORATE SOCIAL RESPONSIBILITY REPORT 2017

Using our heads

Betting on intellect. On the human intellect capable of transforming and improving the world, but also of respecting its delicate balances and preserving its natural resources, which are becoming increasingly scarce.

"Using our heads" is the phrase in which the Vision and Mission of Engineering converge and which affirms its approach to Sustainability.

We need to "use our heads", to look far into the future to decide to bet on talent, and thereby provide sense and value to the daily commitment to customers and society.

Engineering has chosen to bet on intellect to design a better, sustainable future, with the awareness that this is the path to be taken for growth and development.

INTRODUCTION

by PAOLO PAGLIARO

Corporate leaders typically take credit for creating economic value for their shareholders. Despite its authoritative origins, to me, this approach has always seemed to be somewhat diminutive (these leaders also have other duties worthy of merit, such as contributing to people's happiness and protecting the environment). The most accurate formulation of this questionable principle appears to be found in an article by Milton Friedman ("The Social Responsibility of Business is to Increase its Profits"), which appeared in the New York Times Magazine in 1970.

The future Nobel prize winner in economics argued that every company's ultimate goal is to create economic value for its shareholders by maximizing profit. Friedman thus expressed what later came to be known as Shareholder Theory. Several years later, in his book titled "Strategic Management: a Stakeholder Approach", another American, Robert Edward Freeman, set the record straight by explaining that there's a form of corporate social responsibility that goes beyond profit. It involves integrating ethical values into the company's activities, by interacting directly with all the economic agents affected and in any way engaged by its operations on the market (or rather the "stakeholders"): employees, customers, suppliers, collaborators, groups, and institutions.

Freeman's idea was at least as successful as Friedman's, and the fact that they both coexisted in economics textbooks and on boards of directors means that capitalism still acknowledges doubts regarding its nature.



The Social Responsibility Report is the mirror of capitalism reflecting on itself and on its own role. It's the mirror of the tastes, the inclinations, and the culture of those who lead businesses. It tells us about the world in which the company operates and the relationships that have been established between the two, because companies are social animals as well.

In reading the 140 pages that follow, I rediscovered the attitude and the mindset that I learned to appreciate so many years ago in Padua, when I met the founder of Engineering and his small group of friends and collaborators, who, at the time, had just embarked on the pathway that would transform a spin-off in Cerved into an IT company that now employs 10 thousand people and has a turnover of more than € 1 billion.

In the Social Responsibility Report that you're about to read, one of the most frequently used words is "training". This word is even repeated more often than its twin word "innovation": a term that's quite fashionable in corporate rhetoric, and which, in the case of Engineering, is always used deliberately, as it constitutes the commodity that the company produces.

This unusual circumstance on its own is already an important indication of the scale of values used herein. The term training refers to 14,631 days/person of courses provided for employees; an IT & Management school with 200 teachers and 6 thousand students, an e-learning center, scholarships, masters programs, and incentives, because studying brings out talent, skill, and growth. The civic value of this investment (which amounted to € 8 million last year) is extremely high for a country where education and training are confined to the final credits of all programs, including government programs.

For Engineering, the School named after Enrico Della Valle represents a powerful means of disseminating the company's culture and knowledge, and its value, which is highlighted in the Report, extends well beyond its fundamental educational purpose. Having grown accustomed to talk about youth unemployment and the record numbers of Italian youth who aren't attending university or looking for jobs, I was particularly struck by the few lines that the



Report contained regarding the project dedicated to training 400 young NEETs and getting them involved in the labor market in less than 18 months. It is a remnant of a State that disguises itself as a company and who knows how the statistics (and the State) would change if the practice were to spread.

Engineering's business does not envisage any manufacturing process, but only the provision of IT consulting services and services related to the management and storage of customer data. It is thus a post-modern business, where reliability has to do not with materials and their manipulation but with the solidity of intangible assets such as the rationality of processes, efficiency, privacy and security. Assets sold by a company that has envisaged the removal of doors from its offices.

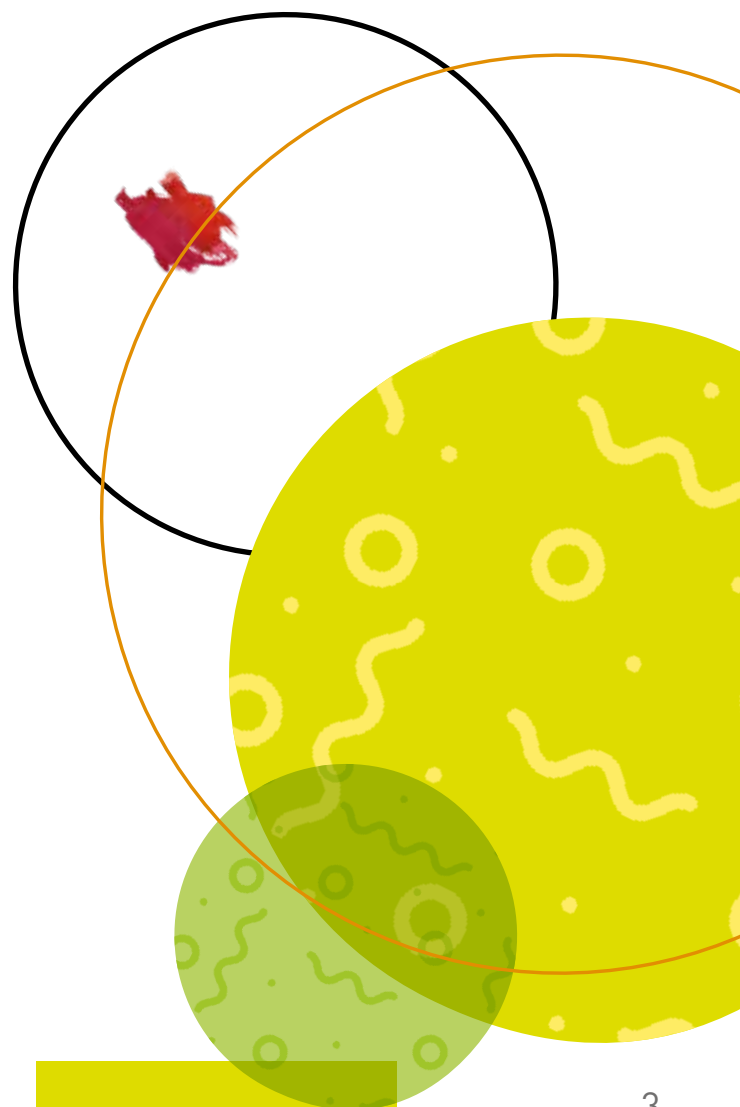
It must not have been easy to select the activities that could be mentioned in the Report, since almost all the products created by Engineering have a public impact. Its application solutions for healthcare are used by 100 thousand doctors, nurses and employees of local health services, as well as by millions of patients. Those for mobility in Brazil allow the citizens of São Paulo to know if their bus is late, and in Spain those of Malaga to make sure that there are free parking spaces (and who knows if one day these Engineering packages will not also be able to improve the life of we poor Romans, perennially waiting for a tram that does not arrive).

Engineering is responsible for the ICT technologies that safeguard artistic heritage, the software that keep the polluting emissions of ships under control, the monitoring systems that help prevent avalanches, the digital solutions against hate speech online, and the new generation of software for tax policies and the fight against tax evasion. These are tools for good politics and good administration, designed for a society that one imagines is eager to improve itself.

This trust in collective responsibility and therefore in the State – more than the many good and excellent practices listed in the following pages – seems to me to be the hallmark of the Engineering company, and the merit of those who lead it.

PAOLO PAGLIARO

*Journalist, TV writer,
and director of the Agency 9 Colonne*



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LETTER TO THE STAKEHOLDERS

GRI 102-14

Dear Stakeholders,

The digital transformation, the new demographic phenomena, climate change, and the depletion of natural resources are just some of the trends taking place around the world. The challenge that companies are facing in the third millennium consists of understanding, interpreting and responding to these social, environmental and economic changes, while at the same time combining business and sustainability to improve competitiveness and create shared value.

With regard to this scenario, the results presented within this fifth Corporate Social Responsibility Report highlight the strategic role that Engineering plays in the country's development and its ability to improve its citizens' lives with innovative services and sustainable solutions.

Engineering is the Italian leading player in the Digital Transformation. It's a company that is capable of converting intelligence into a forward looking technology, and that works on four major pathways of development, thanks to a structured organization and an integrated domestic and international offering: Big Data Analytics and Artificial Intelligence, Cloud Computing, Cyber Security, and Industry 4.0.

For Engineering, 2017 was an extremely positive year in which its revenues overcame the historic milestone of € 1 billion, and its employment figures increased dramatically with the recruitment of 1,122 people (809 in Italy and 313 abroad), over 300 of whom consisted of new graduates under

30 years of age. These were joined by an additional 1,038 new colleagues obtained through domestic and foreign acquisitions.

The Group has thus arrived at a year-end total of approximately 10,300 employees and 3,300 collaborators for intellectual services.

Engineering Group's personnel total has increased by over 3,000 units over the past 4 years. In fact, excluding public and service companies, we're now Italy's third-ranking industrial company in terms of size, with over 10,000 employees, most of whom were hired in Italy.

Digital development requires professionals with specific skills, and those currently present on the market will not suffice to meet the increasing demand. Engineering is therefore committed to supporting and accelerating the process of creating new professional figures, such as the Data Scientist, in collaboration with Italian and foreign academic institutions.

In 2017, through our "Enrico Della Valle" IT & Management School, we held approximately 15,000 training days for our personnel and colleagues, as well as the young people who come to our Company from universities and technical schools. For us, investment in human capital is a factor of strategic importance, and the pursuit of new talent is a way of life; it's an ongoing practice that enriches the Group with innovative ideas and unprecedented skills, which help us to transform our customers' business models into concrete responses to the market's latest challenges.

In this context, the 2017 Social Responsibility Report describes some of our most significant projects, which highlight the impact the company is having within its core areas, as well as numerous initiatives that show how Engineering is playing a leading role in the modernization of the country.

In fact, our Company is the guarantor of high quality levels for all the Country's digital transformation areas: from the management of sensitive data, to the development of projects that define the identity of Smart Cities, not to mention the

development of adequate solutions to meet the growing need to adopt organizational models and systems for Cyber Security and Security Intelligence purposes.

These are the challenges that we're facing, with the goal of improving people's lives and wellbeing. We tackle them in compliance with our Code of Ethics and our system of rules and procedures, which render our Group a reference point, as explained in greater detail within this 2017 Corporate Social Responsibility Report.



Michele Cinaglia

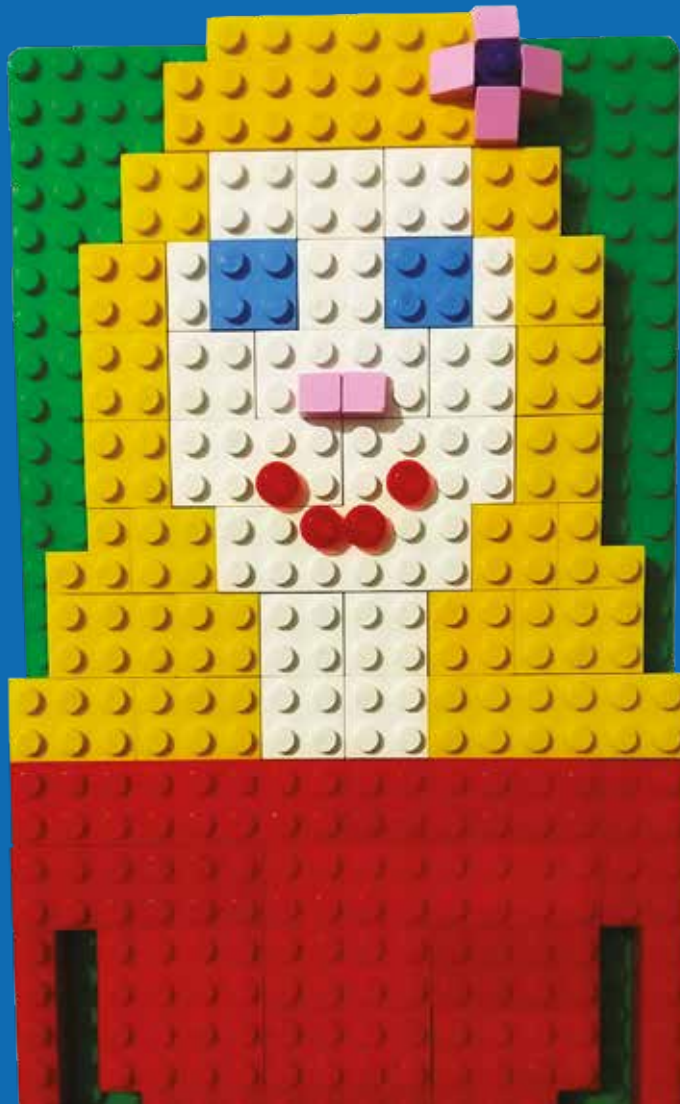
Chairman

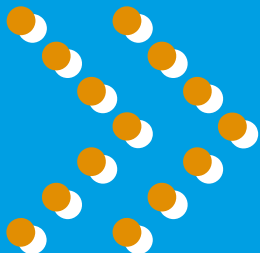
Paolo Pandozy

Chief Executive Officer

AN ITALIAN GROUP

AN INTERNATIONAL MISSION





HIGHLIGHTS 2017

1st

● ranked Italian company in the Digital Transformation

10,273

● employees (and 3,300 collaborators)

over € 1

● billion in revenues

15%

● foreign sales

50

● locations

1,000

● customers

20

● countries served

250

● researchers

€ 30

● million in investments in research and innovation

ENGINEERING OVERSEES THE **INNOVATION FRONTIER**.
IT DOES SO **BY INVESTING IN HUMAN CAPITAL** AND
TECHNOLOGICAL EXCELLENCE, WITH THE BELIEF THAT
THE MOST IMPORTANT CHALLENGE IS TO BUILD A **MODERN**
AND DIGITAL SOCIETY CAPABLE OF MEETING THE NEEDS
OF ITS CITIZENS AND ITS TERRITORY.



LOTS OF COMPANIES, ONE SINGLE GROUP

GRI 102-5 GRI 102-18

Profile

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Engineering Group is a global player in the Digital Transformation sector. The leadership that it has acquired in Italy, as well as on the international markets, is owed to its ability to offer services, products and consultancy through a network of 10,273 employees (as of 12/31/2017), at approximately 50 locations throughout Italy, Belgium, Germany, Spain, the Republic of Serbia, Argentina, Brazil and the USA.

With 85% of revenues generated by a series of projects destined for all areas of the market, Italy still remains Engineering's main reference market. The rest of the turnover is generated through IT activities carried out in over 20 countries.

The Group boasts a consolidated base of 1,000 customers operating in both the public sector (Healthcare, local and centralized Public Administration, Defense, and international bodies) and the private sector (banks, insurance companies, industry, services, and telecommunications).

Our business

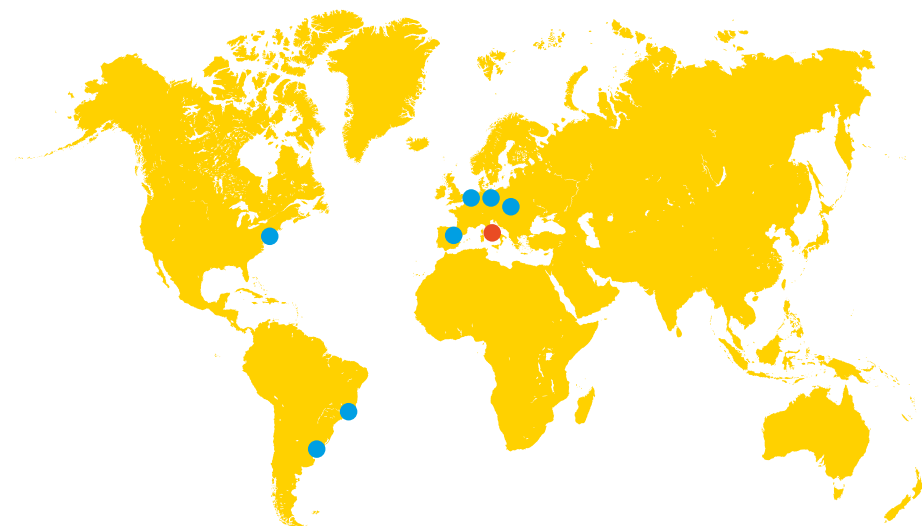
GRI 102-2 GRI 102-10

The Group operates through an integrated network consisting of 4 Data Centers located in the Italian cities of Pont-Saint-Martin (AO), Turin, Milan and Vicenza, through which it plays a major role on the outsourcing and Cloud Computing markets, with an advanced system of services and a technological infrastructure that meets to the very best standards in terms of safety, reliability and efficiency.

The Group's research activities consist of 70 projects carried out both in Italy and abroad, thanks also to the collaboration of a European-wide network of scientific and university partners.

Engineering has thus reaffirmed its leadership in the field of research and development and its ability to provide its customers with a wide range of proprietary solutions, from banking compliance (GRACE and ELISE) to billing and CRM in the area of Utilities (NET@Suite); from integrated Healthcare diagnostics and administration solutions (AREAS®) to Workforce Management systems (Geocall), from mobile

ENGINEERING GROUP WORLDWIDE



● The USA, Brazil, Argentina, Spain, Belgium, Germany and the Republic of Serbia

● Italy

Telco platforms, to Business Intelligence Analytics systems (Knowage) and systems for the management of revenues by the Public Administration. In this manner, Engineering brings innovation to its customer's business processes, not only by offering its own know-how, but above all by providing a key capable of opening up the doors to the future.

The Parent Company

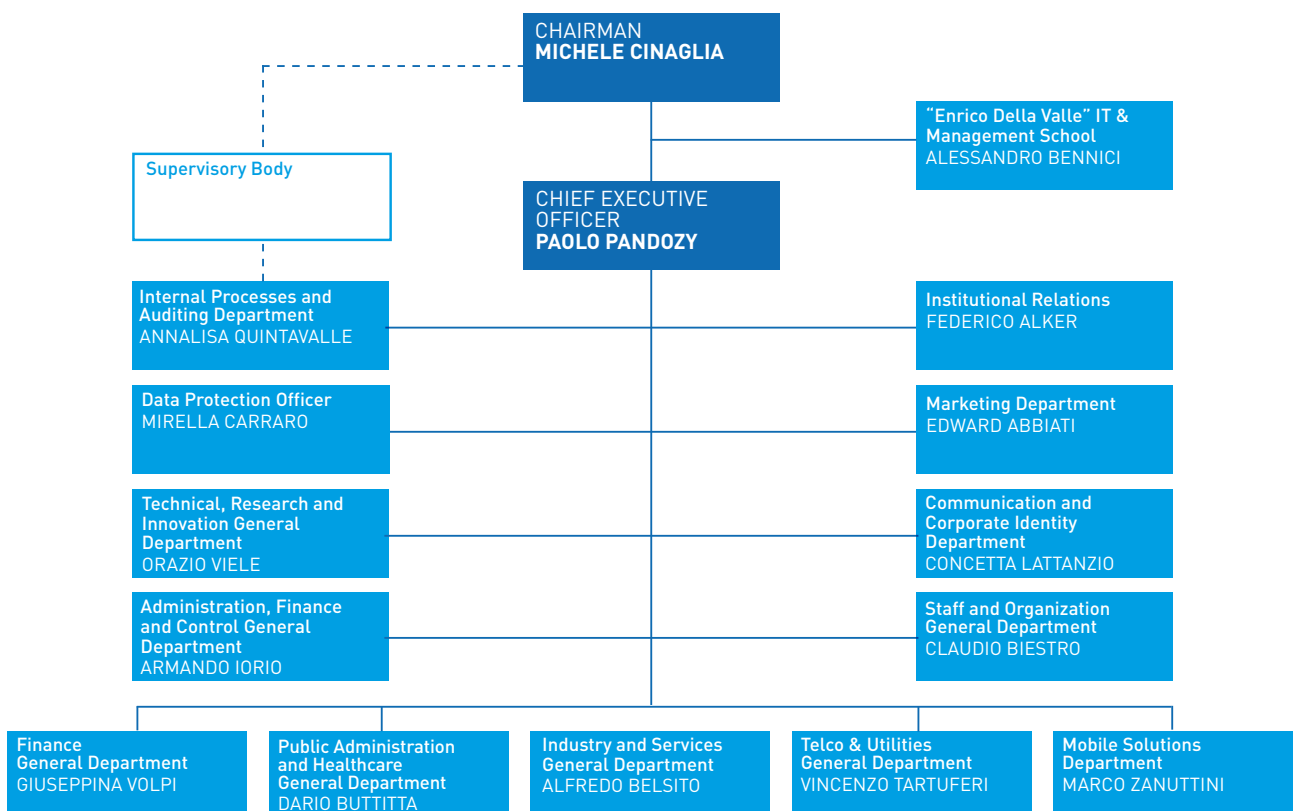
The Parent Company Engineering Ingegneria Informatica S.p.A. is the nerve center around which all the worldwide subsidiaries' activities revolve. It is tasked with providing managerial and business guidance in support of the offering, as well to sustain the image of a highly innovative Group. Considering the breadth of its international presence, the Group has equipped itself with an efficient

structure capable of perfectly coordinating all the centers of management responsibility.

The organization model of the Parent Company Engineering Ingegneria Informatica S.p.A. is structured as follows:

- the staff functions guarantee the efficiency and uniformity of the rules and procedures by offering their services to the Group's various companies
- four General Management Offices oversee the vertical markets (Public Administration and Healthcare, Telco and Utilities, Industry, Services and Infrastructures, and Finance)
- the Technical, Research and Innovation General Department Office coordinates: the execution of the software production processes through the Engineering Software Labs (ESL); the research activities through the Research Laboratories; and

ORGANIZATIONAL CHART (August 2018)



the development of specialized skills, both technical and application-related, across several markets, through the Centers of Competence

- the “Enrico Della Valle” IT & Management School, reporting directly to the Chairman, provides professional courses for the growth of managerial, technological and behavioral skills, two thirds of which are destined for Engineering employees and one third for the employees of client companies.

The main subsidiaries in Italy

Municipia: works alongside large Italian municipalities with ad hoc solutions and projects, and supports more than 600 small and medium sized municipalities with support services and parameterizable solutions, playing a leading role in the innovation of cities, including in important European initiatives, first and foremost FIWARE.

Engineering D.HUB: as a partner for outsourcing services and transitioning to the Cloud, this subsidiary offers methodological standards and a technological and services platform to support the digital transformation within Engineering’s various market sectors. D.HUB coordinates the Group’s entire Cyber Security offering.

Nexen: focused upon consulting for financial and insurance institutions in the areas of Governance, Risk, Compliance, Customer, Offering, Payments, Wealth Management, Credit, Life & No Life, in order to support their commercial, management and governance activities.

MHT: one of Italy’s leading companies in the sector of ERP and CRM management systems, and a Microsoft partner with Gold ERP status, with a focus on Microsoft Dynamics solutions.

Engiweb Security: as an integral part of the Engineering Software Lab organizational structure,

this subsidiary consists of a network of laboratories located throughout the country, which are responsible for software design and development within system integration projects. Engiweb Security provides specialized know-how on the most widespread market application platforms and on the most innovative methodologies for software design, development and testing.

OverIT: specialized in Mobile Business, Workforce Management, Sales Force Automation and Geographic Information System (GIS) solutions through the application platforms Geocall and Space 1, one of the most advanced interaction systems based on augmented reality techniques.

WebResults: this subsidiary is the reference point for the development of cloud applications based on the Salesforce.com platform.

Sogeit Solutions: offers skills, solutions and services for the digital media and broadcasting market.

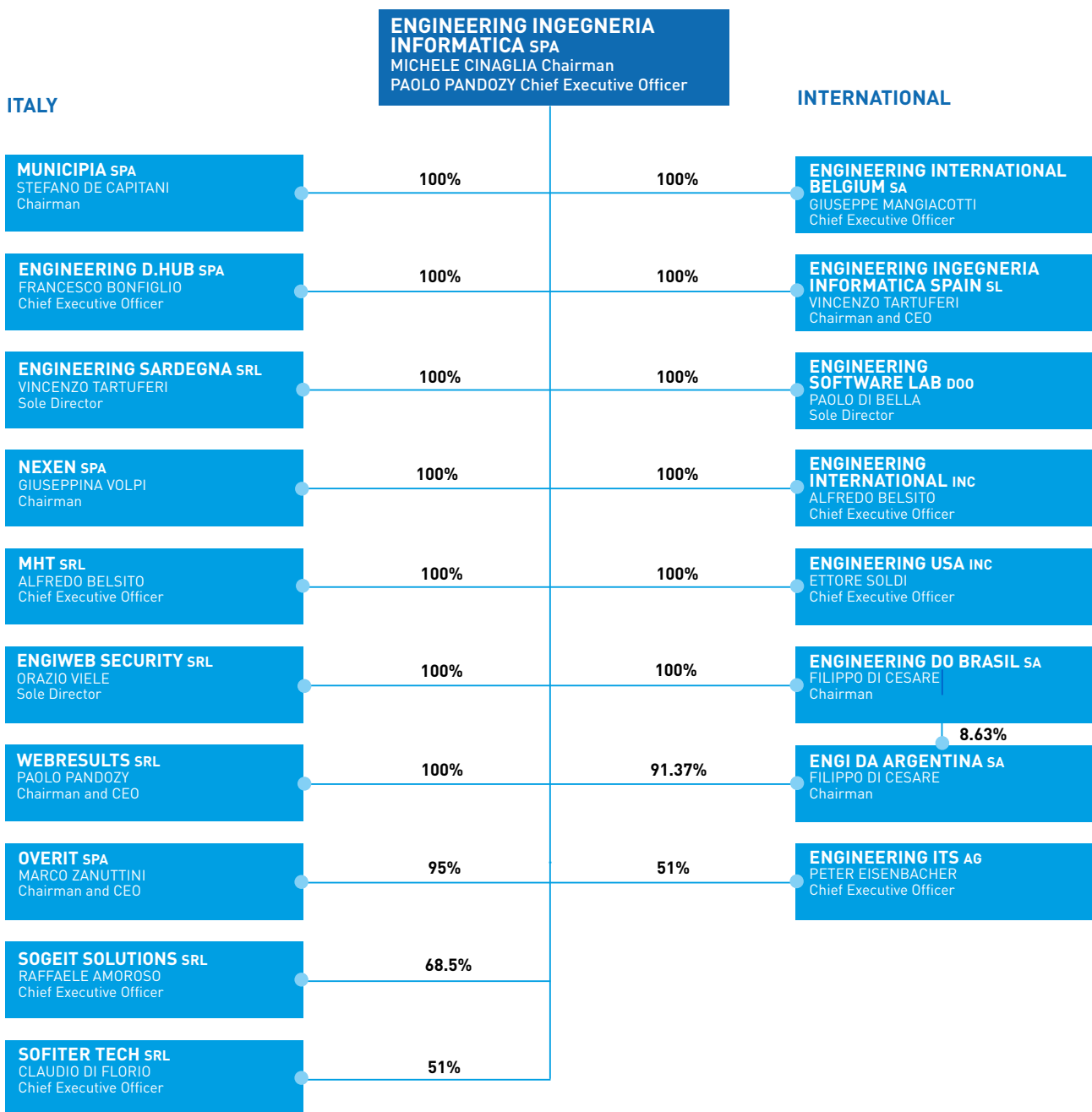
Sofiter Tech: offers companies consultancy and services in operational and functional areas ranging from analysis and organizational planning to the creation of integrated systems for the management of information and business processes, with a particular focus upon the world of agricultural resources.

The main subsidiaries abroad

Engineering International Belgium: as a technological partner for the European Union, this subsidiary is active in international organizations and in the public and private market in the Benelux area and, more generally, the EMEA.

Engineering Ingegneria Informatica Spain: the Spanish branch oversees the Water, Gas and Electricity sectors for Spanish customers, as well as for Italian companies in search of an IT and strategic partner

SCOPE OF CONSOLIDATION (August 2018)



in Spain and Latin America. The company is based in Madrid, where it also has a Competence Center for the Energy & Utilities market.

Engineering do Brasil: set up to support internationalization in markets with high growth and development potential in innovative areas. It has offices in São Paulo, Belo Horizonte, Rio de Janeiro, Curitiba, and Santo André, and in Buenos Aires with Engi da Argentina.

Engineering ITS: this holding company, based in Germany, arose from a partnership with the German group Fnet to oversee the German-speaking market.

Engineering USA: purchased by Hyla Soft in 2017, the company operates in the United States out of its headquarters in Chicago, and is specialized in the Manufacturing IT sector thanks to PLM (Product Lifecycle Management), MOM (Manufacturing Operations Management) and S&OP (Sales & Operations Planning) solutions.

The Centers of Competence

Innovation is the most effective way to build the future. In terms of business, this means that knowledge, research and analysis become the main tools that a company can use to strengthen its presence on the market. That's why Engineering provides its customers with access to its Centers of Competence, whose task is to support and coordinate the Group's various professional figures and technologies.

- **The Project Management Excellence Center**, built in 2017, arose from the organizational transformation of the Project, Program and Portfolio Management and IT Governance Business Units relating to the consulting firm Nexen S.p.A, as part of the

Group, until the end of 2016. The vendor companies of professional ICT and system integration products and services will become increasingly prominent in the future, not only due to their technical skills, but also for their ability to respond to the demand for delivery excellence, and to bring innovation and change to customers. In fact, the Project Management Excellence Center has the following specific objectives: to train and develop a group of professionals with advanced project management skills, capable of taking on specialized PMO activities and contributing to the growth of the Group's Project and Program Manager community.

- **Engineering's Data & Analytics Competence Center** is made up of professionals specializing in all matters relating to the analysis and extraction of value from data, handling them with appropriate methods and tools in order to ensure the proper governance of the entire value chain. Data Management aspects are covered for management and manipulation on traditional instruments (DB and ETL) and, in relation to unstructured data, linked to the Hadoop ecosystem. With regard to these, a wide range of Advanced Analytics and IA services are offered, which involve the use of tools and techniques for complex data analysis through the identification and use of statistical and predictive models, ontologies and semantic analysis, sentiment analysis, data and text mining, knowledge graphs, image processing, speech processing, and machine and deep learning. Ideally the domain will also include all the Data Visualization topics with specific competences relating to BI Self-Service and In-Memory Analysis tools, as enablers of the Visual Data Discovery capabilities that allow the boundaries of traditional BI to be expanded.
- **The e-learning Center of Competence** is a working

¹ The Blockchain is a public register for the management of transaction-related data, which are handled via encryption by the network participants, who are able to verify, approve and record all the blocks with all the data of each transaction on all the nodes.

group that designs and manages learning processes in the context of continuous training, leveraging teaching methodologies and innovative communication in support of the main processes of organizational change: technological, behavioral, legislation, specialized and organizational training.

- **The Enterprise Excellence Center** is focused upon the SAP family of solutions. It has over 800 consultants worldwide capable of providing high-level consultancy for any type of project involving SAP Solutions, approximately 600 of whom are dispersed among the Italian locations in Milan, Rome, Turin, Point-Saint-Martin, Naples, Bologna, and Rimini.
- **The Engineering Usability Lab** is involved in the design, construction, and testing the multi-device interfaces of the sites and applications developed by the Company. At the basis of each activity, be it a new design or a re-design, the approach used is that of User Centered Design, applied by the Center of Competence in accordance with a methodology based on practices, instruments and measures that have been established over the years. The activities of the Usability Lab are incorporated within the normal development project management phases through codified activities and deliverables: user research, benchmarks, information architecture, wireframe, visual design, prototyping, and development guidelines. Each activity is reviewed and monitored through the involvement of end users, with specific attention being dedicated to the topics of accessibility and security.
- **The GIS (Geographic Information System) Center of Competence** specializes in the design and realization of complex cartographic systems, integrating the geographic component into the main business processes. Its work consists of processing and managing data or heterogeneous geographical and

non-geographical events, correlating them to the territorial aspects, in order to obtain dynamic and flexible tools useful for resource optimization and supporting decisions.

- **The Mobile Solutions Center of Competence** designs, creates, and manages solutions in the fields of online services, web applications, and mobility. The Center boasts a group of professionals with the best available skills in the digital sector, who offer twenty years of experience on the consumer market, with a methodological consultancy-style approach. The customer support involves the identification of the actual and potential needs, and the proposal of optimal multi-channel and multimedia solutions with either their own platforms and services or else the market's best practices. Drawing inspiration from the "ubiquitous computing" concept, the Center renders the user experience independent of the time and place of use, and creates optimized solutions based on the devices and access networks.
- **The ECM (Enterprise Content Management) Center of Competence** offers solutions and services aimed at transforming information into company assets and smart content, assisting customers in selecting the tools to meet their requirements, with the ability to design, implement and manage ECM solutions and infrastructures, as well as cloud content. The Center supports IT initiatives with a team of domain specialists with advisory skills for the analysis of requirements and processes, with technical, application and methodological know-how for the creation of solutions, and with a full range of skills in the areas of groupware, content, workflow and knowledge management, to provide services to large public and private organizations.
- **The ITS (Intelligent Transportation Systems) Center of Competence** combines transport system

engineering instruments with procedures, systems and devices that collect, communicate, analyze and distribute information/data among parties, vehicles and cargo in movement, as well as between them and the transport infrastructures or services and information technology applications. The proposed solutions and platforms implement innovative local or distributed control centers with regard to: mobility throughout a city or territory, public transport (Regions, Catchment Areas, Cities, Municipalities), hazardous goods, and road network and infrastructure safety.

- **The Manufacturing & Automation Center of Competence** boasts over twenty years of experience in the design, creation, maintenance and management of solutions to support manufacturing processes in the primary product sectors (Aerospace, Automotive, CPG, Discrete, Food & Beverage, Pharma, Process, White Goods), automation systems, control and communication for transport infrastructure (metropolitan railways, railways, highways), and solutions for process automation at logistics centers. The solutions created by the Center of Competence are Industry 4.0 compliant, meet the most recent IoT protocols and technological standards and are oriented towards vertical and horizontal integration within the customer's ICT ecosystem. With regard to these issues, the Competence Center has released an application framework called DiVE (Digital Virtualization Experience), which consists of integrated modules that, while offering the greatest added value when used together, can even be utilized individually to obtain cutting-edge solutions for specific needs in terms of communication, information distribution, supervision and monitoring, advanced data analysis, and predictive maintenance.
- **The CRM Center of Competence** helps customers define Customer Relationship Management and Customer Experience strategies by designing and

developing tailor-made CRM solutions for the specific needs of various markets: from finance to the automotive industry, from fashion and luxury to the process industry, from retail sales to the mechanical industry.

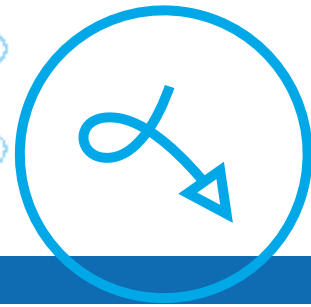
The Center works on market leading CRM platforms (Microsoft Dynamics 365, Salesforce, Sap Hybris), as well as on the major Digital Marketing suites. The availability of proprietary application components developed on various platforms accelerates the development times and limits the project costs.

The imperative of innovation

GRI 103-2 GRI 103-3

For Engineering, innovating means pursuing increasingly advanced technological solutions capable of supporting public policies and improving the lives of citizens. The activities of innovation, research and development embrace the challenges associated with the emergence of new production paradigms and technologies, including Cyber Security & Homeland Security Governance, Health, Infrastructure, Software, Energy, Industry 4.0 Mobility, Space, Cloud, Data and Analytics, Intelligent Transport Systems, Internet of Things (IoT), Smart City, Tourism and Culture.

In order to tackle such a wide range of fields of action, the Company has its own Research and Development division. The first research laboratory was inaugurated in 1987. Engineering has always collaborated with the country's most important scientific organizations and with leading industrial companies, and has maintained its leadership in the software research sector thanks to the coordination of numerous domestic and international projects carried out in collaboration with various scientific and university partners throughout Europe. The Group boasts over 250 researchers, approximately 70 ongoing domestic and European projects, 6 development laboratories, and a 2017 investment plan amounting to approximately € 30 million. Almost half of these are supported by domestic, regional and European Union funding.



AWARDS AND PRIZES

→ Engineering is among the Best Managed Companies

Engineering won the first edition of the Deloitte Best Managed Company award. The award is intended for companies that demonstrate excellent organizational skills and commitment to people, have proven themselves to be solid not only in terms of performance, but also in terms of maintaining long-term strategies, have an extraordinary capacity for innovation and internationalization, and play an active role within their relative ecosystems.



→ Panorama TOP 400: Engineering is among the companies with the best work environments in Italy

A survey by the weekly magazine Panorama ranked Engineering sixth among the IT, Internet and Telecommunications companies most appreciated by their employees. The survey was conducted in collaboration with the online research company Statista. The 400 companies offering the best work environments in Italy were evaluated based on an independent survey, which was administered to over 15,000 Italian workers at over 1,900 companies with more than 250 employees throughout Italy.



→ 2017 Best Talent Hunter Award for best Post-Internship Recruitment Rate

Engineering received the Best Post-Internship Recruitment Rate award at the 2017 Best Talent Hunter Awards, an event organized by the University of Padua's Career Service to acknowledge companies that have implemented the best recruiting and employer branding strategies and activities.



SUCCESSFUL MANAGEMENT, ETHICS AND EFFICIENCY

over 1	BILLION in revenues
91%	THE ECONOMIC VALUE distributed to the stakeholders
52.3	MILLION in net profit
over 4,000	PEOPLE trained on ethics issues over the past three years
over 2,500	COST CENTERS monitored by the management control system
→	the company's CORPORATE GOVERNANCE MODEL complies with the recommendations issued by Consob

The Group's ethics are formalized within the system of rules and procedures that Engineering has set out in its Code of Ethics: a guide for all the Group's collaborators, whose actions must reflect an industrial philosophy based on respect and transparency. In fact, the fair conduct of the company's business is more important than any reported figures, because the conduct that conveys Engineering's worldwide corporate image plays an even greater strategic role than its economic results.

Engineering's figures

GRI 103-1 GRI 103-2 GRI 103-3

For a company that prides itself on innovation, the results contained in the financial statements are the proof of its success. This victory was obtained by overcoming the milestone of € 1 billion in revenues for the first time in the Group's history, which was accompanied by a general improvement in all the primary economic data. The figures as of December 31, 2017:

- the operating revenue increase by € 94.2 million (+10.1%) and reached a total of € 1,028.8 million (€ 19.7 million of which for new acquisitions)
- the "Adjusted" EBITDA amounted to € 122.9 million, for an increase of 13.5% with respect to the previous year

SUMMARY OF THE ECONOMIC RESULTS FROM 2015 TO 2017

(amounts in millions of euros)

Description	2017	2016	2015
OPERATING REVENUE	1,028.8	934.6	877.5
Net revenues	1,000.2	907.6	850.9
"Adjusted" EBITA ²	122.9	108.4	105.5
% of net revenues	12.3	11.9	12.4
"Reported" EBITA	113.5	108.4	105.5
% of net revenues	11.3	11.9	12.4
EBIT	64.8	56.0	55.3
% of net revenues	6.5	6.2	6.5
Net profit	52.3	45.3	45.5
% of net revenues	5.2	5.0	5.4
Net equity	587.0	486.7	442
Net financial assets	-138.1	177.7	144.9

² "Adjusted" EBITDA is to be understood as the EBITDA results including stock option costs.

- the “Reported” EBITDA amounted to € 113.5 million, with a profitability percentage greater than 11%
- the EBIT amounted to € 64.8 million, with a profitability percentage of approximately 6.5%
- the net profit amounted to € 52.3 million, for an increase of 15.3% with respect to the same period of the previous year
- the Group has reported a net financial position of € -138.1 million, as opposed to € +177.7 as of December 31, 2016, which was essentially due to the loan of approximately € 290 million, recorded following the reverse merger of MIC Bidco S.p.A. into the Parent Company.

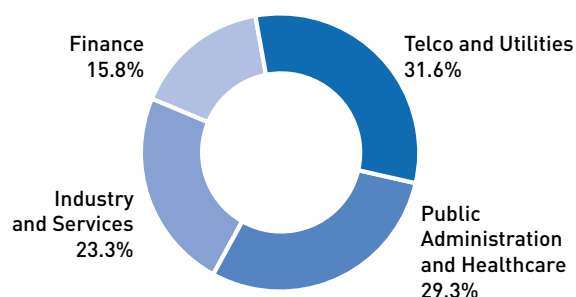
Our contribution to the country's economy

GRI 103-2 GRI 103-3 GRI 201-1

A healthy company's goal is not just to create wealth for its shareholders, employees and suppliers, but also to generate well-being for the country. A shared well-being that has a positive impact on people's lives, like the economic balance of a State. With its constant annual growth, Engineering contributes to the wealth of the country as a whole. As of December 31, 2017 the direct economic value generated by the Group exceeded € 1 billion, 91% of which was distributed. The amount allocated to the State amounted to € 22 million (2.1%).

THE MARKETS

Composition of net revenues as of December 31, 2017



DIRECT ECONOMIC VALUE FROM 2015 TO 2017

(amounts in millions of euros)

Description	2017		2016		2015	
	Absolute V.	%	Absolute V.	%	Absolute V.	%
DIRECT ECONOMIC VALUE GENERATED*	1,039.2	100	951.8	100	901.8	100
DIRECT ECONOMIC VALUE DISTRIBUTED	945.8	91.0	856.8	90.0	807.5	89.5
Suppliers (operating costs)	388.1	37.3	351.9	36.9	331.3	36.7
Employees	518.9	49.9	467.1	49.1	433.1	48.0
Lenders	15.8	1.5	4.7	0.5	10.4	1.2
State	22.2	2.1	32.4	3.4	32.1	3.6
Community**	0.8	0.1	0.7	0.1	0.7	0.1
DIRECT ECONOMIC VALUE RETAINED	93.3	9.0	95.1	10.0	94.3	10.5

(*) Operating revenues plus financial income.

(**) Includes donations and sponsorships with a social impact.

A Corporate Governance that looks to the future

GRI 102-18

In order to grow steadily over time, and gain a foothold on both the domestic and international markets, a company must adopt a long-term strategy by implementing an efficient Corporate Governance system. The outlook adopted by Engineering is consistent with the principles contained in the Self-Regulatory Code published by Borsa Italiana in 2011, amended and integrated in 2016, which is followed by all listed companies.

The same Corporate Governance system also complies with the relative recommendations issued by Consob, and, more generally, with the international best practices. The Annual Report on Corporate Governance, which describes the rules and behaviors adopted by the Group to ensure the efficient and transparent functioning of the governance bodies and the internal control systems, can be found in the Investor Relations section of the company's website (www.eng.it).

Ethics and principles, the architecture of our business

GRI 102-12 GRI 102-16 GRI 103-2 GRI 103-3

In 2004, Engineering adopted a Code of Ethics, which brings together the values deemed essential by the Company for operating on the markets in a transparent manner, and requires the company to conduct itself according to standards based on maximum fairness towards all stakeholders. In fact, the Code contains mandatory standards and guidelines to be observed by Engineering's employees, managers, directors, members of the Board of Statutory Auditors, members of the Supervisory Body, temporary or permanent external collaborators, partners, suppliers and customers.

The verification of the Code of Ethics' application is entrusted to the Internal Processes and Internal Auditing Department, which verifies and promotes

continuous improvement through the analysis and assessment of the risk control processes. With the support of the corporate functions concerned, the Management also oversees compliance with the rules contained within the Code by receiving and analyzing reports of any possible violations.

The Code of Ethics is also an integral and substantial part of the organizational model that the Company has adopted in compliance with the provisions of Italian Legislative Decree no. 231/2001, which regulates the administrative liability of legal entities, and on the basis of which the institutions are held liable, in the manner and within the terms indicated, for crimes committed in the interest or to the advantage of the Company (crimes specifically indicated by the decree itself).

The Code of Ethics is continuously applied and enacted through:

- periodic reviews and updates, in order to ensure that it is always in line with the Company's evolution, and is always compliant with the current applicable laws
- publication on the company's website
- illustration of the content and delivery of copies to all new recruits
- a periodic information and training program for the Company's employees regarding the content and meaning of the Code of Ethics
- constant oversight of its proper application.

In 2017, Engineering embarked on a pathway aimed at obtaining ISO 37001 Anti-Bribery Management System Certification. The management standard, which can be applied to any type of public or private organization, demands compliance with the requirements of an anti-corruption system aimed at ensuring continuous improvement, and requires anti-corruption measures to be taken in a manner considered to be reasonable and proportional to the

organization's business sector, size and complexity. The standard does not overlap with the corruption prevention tools envisaged by the law (corruption prevention plans pursuant to Italian Law no. 190 or Organization Models pursuant to Italian Legislative Decree no. 231), but serves to better and more effectively coordinate the organization as a whole for the prevention of corruption, in conjunction with other business management systems.

Management control: information and transparency

Diligence and the ability to analyze are essential tools for overseeing a company that operates all around the world.

Engineering believes in this principle, and has been investing in the continuous improvement of its management control system for years.

The Group's management control is currently capable of:

- monitoring the performance of the Management Offices and the efficiency of all the operational activities
- measuring the extent to which the set objectives have been achieved
- promptly analyzing any deviations in order to determine the causes
- determining the actions necessary to ensure the achievement of company's objectives.

In order to ensure that the net results of the two accounts (general and analytical) are consistent at the end of each financial period, the system has been prepared by combining the accounting information, used to prepare the statutory financial statements, with information of a non-accounting nature, used to prepare the management report.

By following this approach, the analyses and in-

formation generated by the system are constantly updated for maximum reliability. The Group's companies were progressively incorporated into the system, thus allowing the management to obtain uniform and transparent information regarding general industrial performance.

Engineering's management control system allows the information to be rapidly shared with the management, thereby allowing it to take action by making adjustments in real time, and offering maximum flexibility in terms of changing and adapting the reports based on the company's needs and any updates to the domestic and international regulatory framework. The management control has been operationally structured by integrating the SAP accounting system with the proprietary SIAL analytical order accounting system. The reporting is generated and rendered available to the management, with different aggregation levels depending on the hierarchical level, in 6 progressive closures during the course of a financial year.

Engineering's management control currently allows for the fragmentation and monitoring of the costs and revenues of approximately 25,000 orders, which in turn are aggregated into more than 2,500 cost centers, thus ensuring the proper flow of the data for both operational and accounting purposes. The orders and cost centers are under the direct responsibility of a manager, who ensures the quality and reliability of the data entered into the system. The company's systems were also recently integrated with the internal Business Intelligence project titled MA.R.E. (Management Reporting Engineering), which combines the information received from the various management systems within a single data warehouse, thus further improving the company's ability to process and analyze the overall results.

CUSTOMERS AND SUPPLIERS

THE PARTNERS OF OUR BUSINESS





HIGHLIGHTS 2017

1,000 ● customers

125 ● customers engaged in the satisfaction survey

94% ● of customers satisfied with Engineering's products and services

230,000 ● customer workstations managed with desktop management services

100% ● of suppliers read and accept the Engineering Code of Ethics

A COMPANY'S **PRIMARY GOAL** IS TO GUARANTEE **INNOVATIVE RESPONSES** TO THE NEEDS EXPRESSED BY THE CUSTOMER. **ENGINEERING** TACKLES THIS CHALLENGE BY CONSIDERING ITS SUPPLIERS **ESSENTIAL ALLIES**, FOR A BUSINESS DEDICATED TO **CONTINUOUS IMPROVEMENT**. WHICH THUS BECOMES A **SHARED VALUE** FOR ALL THOSE IN PURSUIT OF QUALITY.

QUALITY OBJECTIVE

GRI 103-2 GRI 103-3

In a world without borders, where international players impose themselves with investments and innovations, a company must focus upon quality in order to stay competitive. With quality being understood as a tangible expression of excellence and added value, which renders products and services useful for meeting the needs and desires expressed by the market.

In this constant pursuit of quality, the starting point remains the customers, with all of their needs and expectations, which are so important that they even change the industrial strategies.

For Engineering, the pursuit of quality is essential, to the point that the Processes and Internal Auditing Department reports to the Board of Directors and reports directly to the Chief Executive Officer.

The Company has also adopted a Quality Management System, which consists of an organizational and procedural structure for supporting the personnel involved in the production processes, and conveys the company's policy in terms of quality and awareness of customer satisfaction. The document qualifying the entire process is the Project or Service Plan prepared when work begins by the Project Manager or the Service Manager.

The document contains all components required for proper Quality planning, integrated with Project/Service Management aspects. The effective application of the Quality Management System and, more generally, the level of compliance with the regulations and company procedures, are checked by conducting audits on various topics, which amounted to a total of 232 in 2017:

- orders completed for customers, which also involves monitoring the status and progress of projects and/or services
- centers of production, i.e. homogeneous organizational units that manage the orders completed for customers or for the company's other functions

- service centers, i.e. the structures that deliver centralized services to customers and to all the other corporate structures
- "transverse" processes, i.e., processes structured by service type, with particular regard to the processes defined by the ISO/IEC 27001 and ISO/IEC 20000 standards
- internal departments and service centers, such as procurement, administration, IT systems, staff and organization, and others.

The analysis of the data collected during the course of the audits allows the Group to gain a better understanding of its production system's strengths and weaknesses. Once the possible improvement measures have been identified, they are presented to the top management during an annual meeting, after which specific elements and indications are identified for the following year's business plan.

In order to guarantee their autonomy, the staff in charge of conducting auditing activities are hierarchically and functionally subject to the Supervisor of the Processes and Internal Auditing Department, whose position within the organization is independent of the functions subject to auditing.

Our customers' satisfaction

Continuous improvement goes hand in hand with customer satisfaction, which can only be guaranteed through compliance with the highest requirements. It's no coincidence that the achievement of maximum customer satisfaction is one of Engineering's greatest objectives, as this is essential to avoid losing a direct relationship with its customers and to maintain a complete awareness of their needs. To this end, the Company's Internal Processes and Auditing Department conducts direct interviews with the customers themselves. The resulting assessments are examined, and the results are reported to

the production, sales and technical departments, in order to allow for corrective and improvement measures to be implemented.

The questionnaire is made up of closed-ended questions in order to ensure the uniformity of the information collected on the following assessment factors:

- communications, commercial relations and offering
- operational staff
- solutions based on projects/products
- solutions based on Managed Operations services
- solutions based on ICT services other than Managed Operations
- specific solutions for customers that use Tax Evaluation and Collection Research Services
- overall Company evaluation
- current activities and critical factors.

During the course of 2017, 125 customers were interviewed, with 87 interviews conducted directly (through meetings held at the customers' premises), and 38 interviews conducted via online questionnaires, selected using criteria of representativeness for the company's various departments.

This activity revealed that, in keeping with the 2016 results, 93.9% of the customers' responses fell within the satisfaction range, with a sharp decline in the percentage of extremely dissatisfied customers, which amounted to less than 1% in 2017.

Protecting data to protect customers

GRI 103-2 GRI 103-3 GRI 418-1

As new discoveries gradually allow for major steps to be taken on the frontier of innovation, the frontier itself is revealed to be increasingly vulnerable and exposed to the risk of external attacks.

The circularity of information (one of the greatest achievements of the Web and of digitization in general) also poses a risk for the proprietors of that information, as increasingly serious threats to priva-

cy and data security continue to spread around the globe.

Engineering tackles this risk every day by using sophisticated technological solutions to guarantee maximum levels of security. The Company's Data Centers store and manage a vast amount of highly sensitive data, including data pertaining to the National Health System, Central and Local Public Administrations, and customers from every domestic production sector. The integrated network of Data Centers includes value added Information Technology services, outsourcing services, and innovative services based on the Cloud Computing model. The overall scope of the services offered includes the management of approximately 21,000 servers, desktop management services for 230,000 workstations, a network of 18,000 pieces of equipment, disk space of over 10 petabytes, 3 different hybrid Cloud offerings, 2 million tickets (user service requests) per year, and more than 1,200 Wide Area Network lines. Boasting the most modern infrastructures and the most advanced technologies, the integrated network of the Group's 4 Data Centers provides over 400 data clients with the highest standards of security, reliability and efficiency. All the Data Centers are fiber-interconnected, and thanks to the latest technologies, are capable of providing Business Continuity solutions for Pont-Saint-Martin and Turin, as well as Tri Data Center solutions (or rather the combination of Business Continuity and Disaster Recovery) for Vicenza and Milan. The Group's offering is completed by cloud management, cloud transformation, system engineering, performance management, networking, and 24-hour monitoring services.

Furthermore, as a confirmation of the extent to which data security is considered to be of primary importance, Engineering has an operating unit led by a Security Director, who is entrusted with the management of the Information/Cyber Security activities.

But protecting data and safeguarding privacy can not only be achieved by streamlining the internal control systems and the staff organization model. For this purpose, it is necessary to engage with the human resources upstream, by increasing their awareness of data protection issues. In order to do this, Engineering organizes specific training activities for the staff of the four Data Centers that provide outsourcing services to its customers (Pont-Saint-Martin, Turin, Milan and Vicenza).

Moreover, in order to guarantee an effective and timely response to any critical issues, the company has implemented a data security management system, which has been externally certified according to the requirements of the international ISO 27001:2013 standard (Information security management systems). The ISO/IEC 27001 standard, from which Engineering has developed its own management system, is currently the only certifiable international standard subject to verification that indicates and defines the requirements for an information security management system.

Engineering has also sought to strengthen its management system with automatic ethical hacking procedures (hacking techniques for defense purposes), in order to continuously monitor and protect the points of access to its own and its customers' data.

Since February 2005 Engineering has also held the CMMI (Capability Maturity Model Integration) certification for the processes, procedures and internal controls of software production. Since October of 2007, the level achieved corresponds to the Maturity 3 standard of the CMMI-SE/SW model v. 1.2, updated to version CMMI-DEV v. 1.3 in 2010.

The company Engineering D.HUB has the ISO 20000:2011 certification for the provision of ICT services in outsourcing mode. In early 2017, the Vicenza Data Center qualified its services as TIER IV, the highest level of service continuity (fault tolerant). The Data Centers located in Pont-Saint-Martin and Turin meet the Uptime TIER III standards (those in Milan are TIER II and Vicenza complies with the TIER IV uptime standards), and contribute to forming one of the most advanced and reliable technological infrastructures in Italy for the delivery of Managed Operations, Business Continuity and Disaster Recovery services.

In 2017 Engineering also obtained ISO/IEC 27018 certification, the first and only international standard that defines control objectives and guidelines for public cloud service providers based on ISO/IEC 27001 in order to ensure the protection of personal data, in compliance with the current directives and the ISO/IEC 29100 standard. The purpose of this standard is to provide a structured method for dealing with the main legal and contractual issues relating to the management of personal data within widespread IT infrastructures by following the public cloud model. The specific countermeasures introduced by ISO 27018 are based on the established international principles regarding privacy. These principles are intended to guide the design, development, implementation, monitoring, and evaluation of privacy policies and privacy controls for Cloud Computing services.

Thanks to its constant awareness of the issue, as well as its ongoing research into all the possible tools for minimizing the relative risks, Engineering has not received any sanctions in recent years, nor has any litigation been brought, and the the Group has not received any claims for compensation from customers.

Our suppliers: allies in the pursuit of quality

GRI 102-9 GRI 414-1

The supply chain, in which the suppliers play a primary role, is an essential element for the pursuit of quality within any production process. Engineering sees its suppliers as strategic partners who must help to confirm the guarantees that the Group ensures its customers, first and foremost the maintenance of the quality standards.

To this end, during the selection phase, the Company initiates a supplier qualification procedure, which then continues with an ongoing assessment in order to ensure the supplier's reliability.

The company's procurement policy requires each supplier to register on the Engineering portal, providing information of a technical and economic/financial nature relating to aspects required by Italian law, but still relevant to the context of Corporate Social Responsibility, with particular regard to proper staff management, such as:

- DURC - Documento Unico di Regolarità Contributiva (Social Security Compliance Certificate)
- DUVRI - Documento Unico di Valutazione dei Rischi Interferenti (Unified Document for the Assessment of Interferential Risks)
- DURT - Documento Unico di Regolarità Tributaria (Tax Compliance Certificate), i.e. certification of the company's fulfillment of its legislative and contractual obligations in relation to INPS, INAIL and Cassa Edile
- INPS and INAIL position: contributory position of the company or the independent contractor
- Employer's Liability and Third Party Liability Insurance Policy: Civil Liability Insurance in relation to Third parties and Contractors.

Engineering also requires each business partner to read the Code of Ethics adopted by the Group and sign

a specific clause in all contracts.

All registered suppliers have prepared a written policy of procedures, on-site audits and specific reporting, to guarantee that they do not use conflict minerals from the Democratic Republic of the Congo and neighboring countries.

Engineering maintains loyal relationships with its suppliers: this loyalty is also guaranteed by the fact that, wherever possible, the Company makes use of companies that are already well-established within the areas in which it operates.

The business of Engineering does not provide for any manufacturing process but only for the provision of IT consultancy services and services related to the management and storage of customer data at the 4 Group Data Centers.

Group purchases regard:

- instrumental goods (primarily basic hardware and software and middleware destined for internal use, for resale, or for the provision of outsourcing services for customers)
- the fleet of approximately 1,200 company cars
- mobile and land-line telecommunications
- travel
- real estate management and maintenance
- professional IT services
- other consultancy services.

Engineering has prepared a list of authorized suppliers for the procurement of hardware products (servers, clients and networks) and basic software. This serves to facilitate, simplify, and control the procurement of these components.

A specific authorization process has also been established in order to allow for the management of any requests (purchase requests) made to suppliers not included on the list.

Faster payments with Reverse Factoring

In order to safeguard its supplier relationships, protecting them against financial risks and guaranteeing respect for the terms of payment, Engineering has adopted the use of Reverse Factoring. This procedure, which is becoming increasingly widespread, entails the specialized company stipulating the contract not with the creditor, but rather with the debtor, which is usually a leading company with high standing, and therefore with a good credit rating. In this manner the company is able to offer its suppliers (who hold receivables in relation to the company itself) the possibility of becoming transferors, thereby allowing them to gain access to financing with favorable conditions.

Engineering has stipulated agreements with the three major Italian banks (Intesa Sanpaolo, UniCredit and BNL), under which the payment of the receivables claimed by the suppliers and transferred to the Factor by the same is regulated according to the agreed terms. By signing the factoring contract, and by adhering to the aforementioned agreement, which entails some of the lowest commissions available on the market, the suppliers obtain the possibility of immediately receiving the payment of the receivable held in relation to Engineering.

Reverse Factoring agreements support the Italian production chain, and are beneficial to both parties involved. Using this tool, Engineering is able to prevent the financial cost of any delayed payments or litigation, increase its appeal in relation to any potential new suppliers, reduce the purchase price of goods and services, and support its own production chain.

The Company is also able to simplify the administrative procedures associated with its suppliers' accounting by optimizing the scheduling of the treasury and the financial flows.

For their part, the suppliers are given the opportunity to gain access to new complementary financial resources, to regularize their cash flows, and to obtain guaranteed collection times, while at the same time reducing their credit management costs and financial charges.

The added value of external professional services

For professional services, Engineering makes use of highly specialized external personnel, who collaborate on the Group's projects from time to time. The aim is to initiate a process of mutual enrichment between specialized external personnel and the Company's employees.

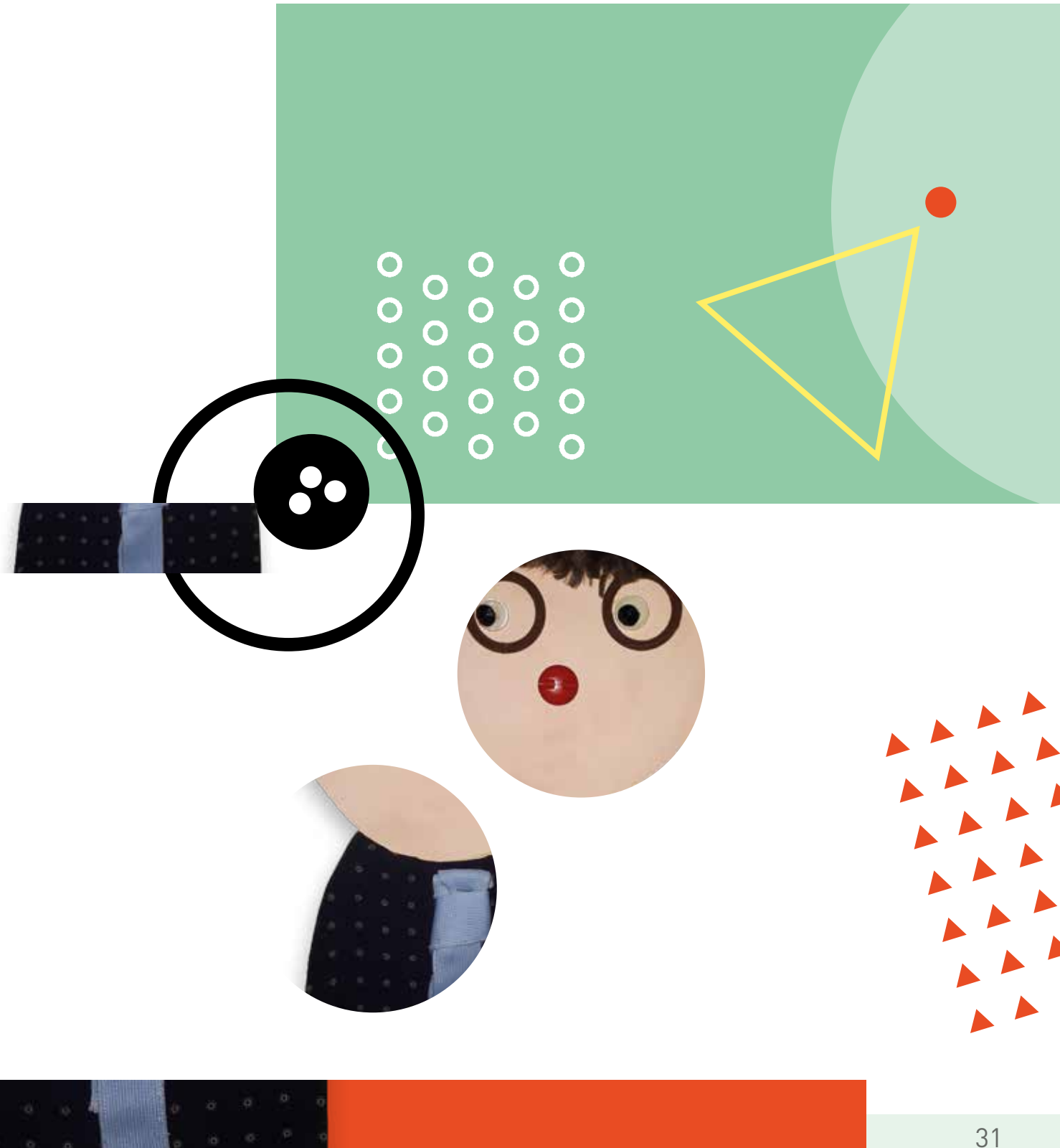
In 2017, approximately 3,300 external resources collaborated with the Group.

The procurement of professional services is centralized by the IT Consulting Procurement Department (DACI), which reports directly to the Administration, Finance and Control General Department. This strategic decision has changed many of Engineering's relationships with its suppliers, by reducing their fragmentation and concentrating the number of external parties, thereby simplifying the administrative processes.

This decision also consequently improved in the Group's negotiation capabilities.

The underlying objectives of the aforementioned procurement centralization process also included the optimization of the use of internal professional resources, and the guarantee that the conditions of negotiation and the application of the rules would be uniform throughout the country.

The Group always verifies that the contractual process adopted by its providers of professional services or external personnel is consistent with the Italian labor legislation.



human capital



HIGHLIGHTS 2017

- 10,273 ● total employees (9,329 in Italy and 944 abroad)
- 809 ● employees hired in Italy
- 313 ● employees hired abroad
- 1,038 ● employees obtained through acquisitions
- 300 ● recent college graduates hired
- 84% ● employees who undergo performance assessments
- 59% ● college graduates
- 95% ● apprenticeship contracts converted into open-ended employment contracts
- 14,631 ● training days/person provided to employees

IN A COMPANY'S DEVELOPMENT PROCESSES, IT **THE PEOPLE** THAT MAKE ALL THE DIFFERENCE. AND EVEN WHERE EVERYTHING SEEMS TECHNOLOGICAL, **IT'S THE EXPERTISE AND EXPERIENCE OF INDIVIDUALS** THAT GUARANTEE **QUALITY AND EXCELLENCE**.

THE PEOPLE: MESSENGERS OF THE CORPORATE PHILOSOPHY

It's the human capital that makes all the difference in the business development processes.

The expertise and experience of its personnel are the pillars upon which Engineering has always based its business methods, by investing in the men and women who contribute to the Group's success. 10,273 employees, for an increase of 14% with respect to the 8,842 of 2016, in addition to roughly 3,300 collaborators for external IT services, distributed throughout Italy and the various European locations (Belgium, Germany, Republic of Serbia and Spain), and even beyond (Argentina, Brazil and the United States).

Engineering's staff has increased by 13% in Italy, and by over 22% abroad, for a total of 944 units. Women represent roughly 30% of the total employees, a significant proportion considering that most of the workforce is comprised of technical graduates and software engineers, historically male professions. Personnel retention is good and the outgoing turnover rate amounted to 7.1%, a substantially natural value that was consistent with the previous years.

In search of new talents

GRI 103-2 GRI 103-3

The strategic role played by the human capital takes on an even greater meaning when considered in light of the new generations. That's why Engineering is constantly engaged in the search for new talents, as this allows the Group to continuously obtain innovative ideas and new expertise.

In 2017, the Company continued to pursue its growth policy: the staff increased by 16% and the company conducted over 3,950 recruitment interviews, after initially evaluating nearly 14,500 resumes.

Over the course of one year, the Group hired more than 300 recent college graduates, in whom it is pre-

pared to invest in order to lay the groundwork for a future based on new skills and innovation. In order to do so, the company maintains important relationships with the world of academia, which acts as an important reservoir of talent and resources.

This continuous search for new talents has one clear goal: with their help, Engineering intends to invest in the most innovative sectors of the digital transformation, in which the need for a competitive edge is most evident. To this end, the Group is proceeding with numerous partnerships, and guarantees its support for specific projects such as "IG4U", a series of business games organized in 2017 by various Universities (the Polytechnic University of Bari, the University of Calabria, the University of Palermo, the University of Salerno, the University of Catania, the "Federico II" University of Naples, the "Parthenope" University of Naples, and the "Tor Vergata" University of Rome), which are aimed at identifying and supporting new talents in Southern Italy.

New professional figures to write the future

GRI 103-2 GRI 103-3

While digital development requires specialized professionals, one-third of the workers currently active in the ICT arena have insufficient digital skills: a gap which, in 2020, will risk creating a market deficit of 750,000 adequate professionals³.

To ward off this risk, the European Union launched the Digital Skills and Jobs Coalition in 2016, a partnership which brings together all parties concerned and the Member States to share best practices and reduce the digital skills gap in Europe.

Engineering participated in the coalition with the EDISON (Education for Data Intensive Science to Open New science frontiers) and Program the Future projects.

³ Digital Competence Observatory 2016.

EDISON, of which Engineering is a founding member, is a project funded by the European Union which aims to support and accelerate the process for the creation of the new profession of Data Scientist, an expert capable of extracting significant value from the data collected and managing their entire lifecycle, including supporting the electronic infrastructure of scientific data.

Program the Future, on the other hand, is one of the sixteen projects selected as finalists for the European Digital Skills Award 2016, an award given to projects that encourage people to develop digital skills for work, education and life in general.

The Group has supported projects for the development of new ICT professions domestically as well. In fact, it contributed to launching and developing content for the second-level Master's program in Data Science for the 2016/2017 academic year at the University of Perugia. At the University of Calabria, the Group also contributed to the creation of Italy's first master's specialization course in Digital Document Management and Storage, an activity not yet adequately covered on the Italian training landscape.

Investing in people to further the Group's growth

GRI 404-3

Boosting the retention of internal resources, enhancing their talent: this is the goal that Engineering pursues not only by offering its workers a high-performance environment, but also through a remuneration policy with a variable component linked to individual performance, and a performance bonus that recognizes individuals based on the Company's overall results.

The Company is committed to precisely defining the professional profiles assigned to its employees, in order to establish a uniform and transparent career development process with each staff member. This

process was launched with an awareness that the individual's professional development goes hand in hand with the Group's success.

In this regard, Engineering established the MeM (Master in Engineering Management), a master's program for high potential figures in whom the Group has chosen to make targeted investments, with the aim of ensuring the continuous development of its human resources' skills. The latest edition of the MeM was attended by 54 Group employees.

The close correlation between professional profiles and their evolution through the tools offered by the training is also supported by the company's IT system for requesting training modules, which filters access based on professional requirements consistent with the features of the course itself. The evaluation process, which constitutes another key element for personal growth, has progressively expanded, and now covers approximately 75% of the staff.

In its pursuit of quality, the Group maintains a constant awareness of workers belonging to protect categories, whose integration is constantly facilitated thanks to multi-year recruitment and insertion programs.

All of this is a reflection and summary of what Engineering considers to be its fundamental values in the field of human resources, or rather solidarity, safety, and recognition of merit. A fundamental philosophy to which the Company has always remained loyal, by maintaining fair and transparent relationships with all of its workers.

Close to our people

Despite its international presence, Engineering Group's corporate strategy relies upon on the local and wide-reaching presence of its Personnel and Organization Department, which maintains a physical presence at all the Group's main offices: five in the

northern Italy (Pont-Saint-Martin, Turin, Milan, Brescia, and Padua) and five in the central and southern Italy (Florence, Ancona, Rome, Naples, and Palermo).

Even where it is not present with an office, the Personnel Department ensures at least a weekly presence, which allows for direct relationships to be maintained with the employees at all the Italian locations.

The use of an approach that relies upon a physical presence arises from the need to provide employees with the necessary amount of flexibility in cases where frequent interaction with customers (often even far apart), or the project's characteristics, make it necessary to deploy new flexible forms of work, such as telecommuting (i.e. the possibility of working full days from home) and smartworking (i.e., the possibility of alternating between working from home and working at the office during the same shift).

The level of dialogue and listening between the various hierarchical levels is high, as is that between new recruits and the rest of the Company, which is also facilitated by an "open door" policy that has provided for the elimination of office doors.

Following this philosophy, the Group organizes specific events where the management meets and converses with participants, and in 2016 it commissioned a survey on the satisfaction levels of people who had worked for the Company for just a few years. For this purpose, a questionnaire was directed to all the interns who had been granted permanent contracts since 2011, in order to analyze the various dimensions of their career paths, such as their level of involvement in the activities carried out, the effectiveness of the training opportunities, the degree to which their expectations have been met, the level of compliance with the role outlined, and the possibilities for growth. 76% of those who received the questionnaire responded, and the level of satisfaction was generally found to be good.

Welfare, the school of well-being

The renewal of the National Collective Labor Agreement for the Mechanical Engineering sector provided Engineering with the opportunity to implement new measures in relation to the Group's welfare plan, which currently covers approximately 8,000 people.

Following the latest renewal, the agreement requires company to offer their workers a € 100 value package for 2017, a € 150 package for 2018, and a € 200 package for 2019, which can be used for numerous welfare goods and services, such as training courses, recreational goods, sports activities, home care services, health services, fuel vouchers, shopping vouchers, and public transport services.

The project envisaged by Engineering expands the scope of the National Collective Labor Agreement considerably, and even offers the company's employees the opportunity to request the conversion of the Performance Bonus into welfare goods and services, thus giving a major boost to the introduction of a structure plan.

Taking advantage of the regulatory stimulus, Engineering has launched an even more engaging project, which offers people a productivity-based incentive.

In order to raise maximum awareness of the new developments introduced, a "roadshow" was organized at the Group's various locations, with informational sessions being held at over 40 offices throughout Italy in the presence of over 2,000 employees.

In giving its employees the possibility of converting their Performance Bonuses into welfare goods and services, Engineering offers them considerable flexibility, as there is no minimum entry amount, and the convertible sum can even amount to the entire value of the balance paid out (approximately € 400 for 2017).

The employees have a platform at their disposal, which was chosen by Engineering through a tender process involving seven companies in the sector, which resulted in Edenred being awarded the management of the digital tool that allows the employees to propose conventions with new businesses, bringing them to the provider's attention.

The program's validity is reflected in the results recorded for 2017: in fact, out of a total of approximately 5,000 employees entitled to the Bonus, 825 requested the method of use. Moreover, 430 converted 100% of the amount into welfare services.

Despite the progress that has been made, at Engineering, corporate welfare is still considered to be "an ongoing project" by its promoters. The goal is to raise awareness of the alternative forms of remuneration available in addition to the traditional payslip, and to make people understand that the project is a win-win for everyone: in fact, converting the entire bonus results in tax benefits for both the company and the employee, not just one or the other.

A positive work atmosphere

The work atmosphere is a critical variable, not only due to its impact on the personnel's motivation, dedication, and efficiency, but also due to the impact that it has on interpersonal relationships and loyalty to the Company.

The Company's ability to meet the expectations of the two types of customers (internal and external customers) has a considerable impact upon its success. The atmosphere analysis allows the company to understand the employees' organizational experiences and points of view, and to clearly and accurately track the pathway taken.

In particular, the atmosphere analysis:

- constitutes an important organizational diagnostics tool
- acts as a good indicator of worker satisfaction
- provides feedback on the coordinators'/managers' activities
- constitutes an objective document to be provided to external auditors (in fact, the atmosphere analysis is considered a scientific study)
- provides useful information regarding training requirements
- is an activity that's inherently capable of generating engagement and participation, as it bears witness to the special attention that the Company dedicates to its human resources.

For these reasons, Engineering conducted an atmosphere analysis in 2017, during which 6,412 anonymous interviews were conducted by administering an online questionnaire to the company's personnel. The response rate was 76%. The analysis of the results revealed a considerable level of satisfaction among the employees, equal to 85% of the subjects interviewed, both among the general department employees and the employees of the Group's companies.

The interviews were aimed at analyzing the following areas of satisfaction:

- belonging (the sense of belonging that the employees feel towards the company as a whole)
- role objectives (knowledge and experience of their specific roles within the company)
- role characteristics (methods of expression and implementation of their tasks and duties)
- the organization's objectives (knowledge of the company's strategies, objectives, and current and future results)
- management (resource management methods and employee/supervisor relationships)
- respect for employees (consideration and respect shown towards employees)
- fairness of the work relationship (life-balance and adequacy of corporate benefits).

The areas that showed the best results were the pride the employees feel to work for Engineering, their sense of belonging, and their ability to act as ambassadors of the Company's values for the outside world (advocacy).

The employees also affirmed that they feel respected, that they find their work interesting, and that they agree with the Company's objectives.

With regard to the evaluation of the workplace, the results expressed were generally positive. The highest scores were attributed to the efficient use of the rooms and spaces, and the Internet connection, while for the sharing of information the channels most utilized overall were those provided on a centralized basis: above all the intranet, the website, and the press release.

Workplace safety

GRI 403-2

For Engineering, minimizing the possibility of accidents occurring while carrying out duties at the office and at the Group's four Data Centers is an extremely important objective.

In order to achieve this goal, the Company has adopted a series of measures:

- the updating of the types of health and safety risks and hazards that can be attributed to the employees' activities
- the proper management, updating, and communication of the internal policies and procedures published on the intranet and disseminated to all the collaborators for the proper execution of the work activities in terms of accident prevention
- the provision of specific classroom and on-site training activities for the prevention of risks at the workplace
- the execution periodic internal audits on the correct implementation of the procedures.

The Group has recently launched a program dedicated to the employees' well-being. In this regard, activities aimed at pursuing this objective will be implemented in the future. In order to safeguard the health of its employees, the Group has established an Accident Observatory within the context of its Staff Administration Department, which is responsible for carrying out all the checks necessary to detect any failures in the safety management system in terms of planning, training, insufficient operating instructions, shortcomings in work procedures checks, and inadequate or unsafe tools, machinery or equipment.

The data collected show that the number of accidents that took place in 2017 is consistent with the previous years. The most frequent types of accidents that occurred were car or motorcycle accidents, which either took place during commutes, or else when traveling to the customers' offices. In order to minimize this risk, the Company has published a dedicated guide containing specific operating instructions, and has

even been offering safe driving courses since 2009. All the Engineering employees in Italy are engaged in an ongoing general education, instruction, and training program sized and structured according to the requirements of Italian Legislative Decree no. 81/08

and the State/Regions Agreement of 07/07/2016. The main data regarding the hours of training and the number of people trained over the past three years are provided below.

ACCIDENTS BY TYPE⁴

	2017	2016	2015
Women	30	32	27
Men	65	63	54
Total number of accidents	95	95	81

ACCIDENT RATES⁵

	2017	2016	2015
Frequency rate	5.97	6.47	5.71
Severity rate	0.11	0.15	0.16
Incidence rate	11.89	12.53	11.20
Average duration	17.92	23.03	27.56

HOURS OF PROFESSIONAL TRAINING ON WORKPLACE HEALTH AND SAFETY

	2017	2016	2015
Managers	112	505	598
Middle Managers	421	3,640	2,749
Office employees	10,554	12,560	8,605
Total Italy	11,087	16,705	11,952
of which number of hours for:			
Men	7,568	10,520	8,247
Women	3,519	6,185	3,705

EMPLOYEES TRAINED

	2017	2016	2015
Basic Training and Updating	1,309	1,232	3,426
Training on Specific Risks	707	524	140
Training of Safety Supervisors	127	492	89
Training of Safety Managers	7	17	11
Training of Emergency Intervention Personnel:			
First Aid	90	59	97
Medium Risk Fire Prevention	135	86	140

⁴ The majority of the accidents over the past three years, equal to approximately 87%, consisted of car or motorcycle accidents. The scope consists of the Group's employees.

⁵ INAIL frequency index: the ratio between the number of accidents and a measure of the duration of the risk exposure, both uniformly delimited in time and space (territory, facility, department, work area, etc.). Formula = total No. of accidents x 1,000,000/no. of hours worked. INAIL severity index: relationship between a measure of the debilitating consequences of the accidents and a measure of the duration of the risk exposure, both uniformly delimited in time and space (territory, facility, department, work area, etc.). Formula = [days of absence (excluding the day of the accident) + days of permanent disability by convention/no. of hours worked] x 1,000.

Culture, information and leisure

Engineering promotes its collaborators' engagement and participation in cultural and sporting events.

SkiChALLENGe and Project Culture

For several years, the Company has been holding the SkiChALLENGe, a ski tournament open to the Group's employees, friends and relatives.

The Company has also been collaborating on the Culture Project for ten years, an initiative targeting all the Group's employees who have personal passions linked to literature, music, theater and painting. In recent years it has also supported various art exhibitions and theater performances, as well as the publication of roughly 20 volumes of prose and poetry, which were donated to the authors free of charge.

Daily information

Since 2017, all the Group's employees have been receiving two daily press releases, the first containing articles in which Engineering or the Group's companies are expressly mentioned, and the second containing industry and business-related articles, which are divided into technological/market, competitor, and foreign press areas.

Additional information is also distributed via EngZine, a video press release containing technology-related news items. The video-magazine is shown daily on the monitors displayed throughout the Engineering offices.

The INSIDE blog

The "INSIDE" company blog was created in 2016 with the aim of creating a place for exchange and belonging. The blog described corporate projects, case studies, events and initiatives, with a continuous focus upon innovation, and provides a forum for sharing opinions, insights and comments on the published articles. INSIDE is edited by a group of colleagues from the various Departments, but all the employees can participate by submitting content of common interest.

"My selfie" and the corporate Santa Clause

In 2017, Engineering once again involved its employees' children and grandchildren in its usual Christmas communication project. The project, titled "My selfie", required children and teenagers to submit self-portraits using any medium and technique, excluding videos or photographs. The response was remarkable: more than 2,000 images were submitted, including drawings, paintings, paper collages, and compositions, as well as sculptures made using fabric, plasticine, and plaster. All the "selfies" were published online at www.eng.it/ilmioselfie, and some were published in the 2018 calendar, over 10,000 copies of which were distributed to employees, customers and partners over the holidays. All 2,000 children and teens received gifts from the company's Santa Clause.



Christmas for the children

In 2017, almost 1,000 children of employees (from the Rome, Naples and Milan offices) participated in the Christmas initiative that offered them the opportunity to visit the theater or the circus with their parents. Together with their families, the children in Rome had the exclusive opportunity to see CirCuba, while the children in Naples attended the musical Robin Hood, and those in Milan went to the theater for the musical Madagascar.

Support for education

Engineering sees education as a fundamental value, one that's so important that it must be shared with all of its employees. Bolstered by this philosophy, The Company aims to promote the social and cultural development of its employees and their families, by setting aside specific resources to support and incentivize second-level scholastic education and university instruction for the most deserving, based on principles of solidarity in light of the household's income situation.

Scholarships

For the 2016/2017 scholastic and academic year, Engineering established 75 scholarships for its employees' children, to be awarded based on a special selection process. Of those available, the following were awarded:

- 21 out of 25 scholarships worth € 500 each for obtaining a high school diploma, which were paid out in February of 2018
- 18 out of 25 scholarships worth € 1,500 each for obtaining a three-year university degree, which were paid out in July of 2018
- 12 out of 20 scholarships worth € 2,000 each for obtaining a master's degree, which were paid out in July of 2018
- 3 out of 5 scholarships worth € 3,000 each for obtaining a master's degree in Information Technology or another scientific subject with an innovative thesis topic useful for developing the Group's activities, which were paid out in July of 2018.

Textbooks

In accordance with the criteria adopted for the granting of family benefits, in 2017 the Company offered a contribution for the purchase of the textbooks adopted by the upper middle schools run or legally recognized by the state, provided that the employee's child obtains an average grade of at least 7/10 or equivalent.

THE “ENRICO DELLA VALLE” IT & MANAGEMENT SCHOOL

GRI 404-1



HIGHLIGHTS 2017

200 ● teachers (40% internal Group specialists with multiple years of training experience)

6,475 ● pupils trained

18,691 ● days/person of training

363 ● courses in the catalog

16 ● classrooms (at the Ferentino location and at the main company offices)

50 ● customers among the leading national and international companies

851 ● professional certifications

EXPERTISE AND QUALITY CAN ONLY BE ACHIEVED AND MAINTAINED THROUGH A PROCESS OF **CONTINUOUS TRAINING**, WHICH TRANSLATES INTO THE **CONTINUOUS UPDATING** OF THE EMPLOYEES' PROFESSIONAL SKILLS. THIS IS EVEN MORE TRUE FOR A COMPANY WHOSE STRENGTH IS BASED ON ITS **CAPACITY FOR INNOVATION**.

KNOWLEDGE, KNOW HOW, AND KNOWING HOW TO BE

Ongoing training to stay competitive on the market

GRI 103-2 GRI 103-3 GRI 404-2

Once the centrality of the human capital is also shared among the most innovative processes, it becomes clear how the market's challenges can only be overcome by ensuring that your resources are always prepared and competitive, and that they achieve skills and levels of excellence greater than those of the other companies at the technological forefront.

In order to promote the continuous updating of its human capital, in the year 2000 Engineering established its "Enrico Della Valle" IT & Management School, which is headquartered in Ferentino (FR) and has since become one of the Group's most important and exclusive assets.

The important role played by the School, and its continuous evolution in terms of training capacity, are reflected in the numbers: in fact, in 2017 alone, over € 8 million were invested in professional development activities, with 14,631 days/person in training provided to the employees.

The Engineering training center for excellence

GRI 404-1

The "Enrico Della Valle" IT & Management School was set up as a training institute for Engineering's employees, where the experience and know-how gained from the hundreds of projects carried out over the course of 35 years can be shared with the company's employees, especially the new hires. Since 2009, Engineering has even been sharing the wealth of knowledge and professional experience gained from the ongoing training processes designed for its employees with its customers as well.

All this is guaranteed by a structure designed to better respond to the need for growth and training.

In fact, the School's headquarters offer 16 computerized methodological classrooms, a lecture hall capable of accommodating up to 140 people, a specialized library, an internal cafeteria. Moreover, each employee's participation in the courses is supported by a residence system that's integrated with the best hotels, in order to provide "full immersion" style training.

Training areas and professional certification policies

The School's entire educational offering is aimed at developing skills on three levels: knowledge (technical and specialized skills), know-how (practical skills, application of technical-specialized knowledge), and knowing how to be (behavioral skills). The training offering, which is outlined in a continuously updated course catalog currently consisting of over 360 titles, is therefore structured according to three main subject areas.

Technologies: courses dedicated to learning processes for the programming, analysis and design of hardware and software systems (designing and implementing websites, mobile applications, complex Cloud systems, Business Intelligence and Big Data solutions, etc.)

Methodologies: specific courses relating to learning methodologies and capacities linked to functional areas (Project Management, Software Measurement, Demand Management, Service Management, etc.)

Management and personal development: initiatives intended to favor the behavioral and managerial development of human resources through the acquisition of transversal soft skills within a growth process that engages both the individual and the organization. The areas of analysis range from job analysis to experience and knowledge management, planning training and advisory activities.

There are also courses intended for specific professional categories such as apprentices, managers and project managers, which guarantee an ad hoc training offering.

Particular attention is paid to the skill certification policies. The School, which issues an average of 900 professional certificates per year, is also a Testing Center accredited by the main international professional certification bodies to independently administer certification exams for all the technologies most widely used on the IT market.

Leveraging the experience gained for Engineering Group and for clients by designing training programs aimed at obtaining technical certifications, the catalog of courses offers numerous educational solutions aimed at preparing for the certification exam on the main software technologies and environments currently present on the market.

Since 2006, the School has also been at the forefront in the design and delivery of courses aimed at obtaining PMP® (Project Management Professional) certification, which has now become a fundamental reference point for internal human resources assigned to project management, from the planning phase to closure.

The pursuit of excellence through personalized training

Each individual has an important task to perform for the life of Company and the growth of the business. A specific, almost unique, task, which renders them an essential component of the machine as a whole. However, allowing the individual professional to achieve maximum efficiency, while at the same time working in harmony with all of their colleagues, is a complex exercise that requires an additional step in the training process.

This step is completed through a specific training program, which is designed based on the respon-

sibilities that each worker has within the company, the characteristics of the target market, and the objectives of the organization to which he/she belongs. These personalized training pathways cast solid foundations for the development of effective personnel growth plans within specific and organizational and business contexts. In this regard, over the years the courses based on content of a technical and specialized nature have been gradually combined with additional courses targeting both the development of managerial and entrepreneurial skills and the acquisition of intangible skills associated with everyday work activities.

That's why the employees' training plans are not only defined based on the market dynamics, but also the prior analysis of the participants' responsibilities, and those they will have in the future based on the evolution of their professional classifications.

Internal training figures and activities

During the course of 2017, 363 different editions of 212 separate training courses were held within the classrooms of the "Enrico Della Valle" IT & Management School, for an increase of 7.6% with respect to 2016.

A total of 3,265 employees participated in the classroom activities, for a total of 14,631 classroom days/person of classroom training (+3.1% compared to 2016) carried out for 4,546 students. These numbers are combined with the increasingly numerous distance learning initiatives conducted through WBT (Web Based Training) and webinars, which are rendered available to the Group's employees thanks to ForENG, the company's Learning Management System.

Among the training initiatives launched during the course of the year, the following are worthy of particular mention:

1. The completion of 5 different full-immersion residential training courses aimed at incorporating 60 recent college graduates, who have distinguished themselves as SAP consultants and Java Developers, into the company. These training courses, which featured an innovative teaching methodology with theoretical discussions constantly accompanied and complemented by practical laboratory exercises and illustrations of usage cases and current projects, consisted of scheduled weekly meetings with the Company's senior technical managers, where the students were taught the best practices within the scope of the Group's projects with a high degree of technological innovation. Once the classroom training was complete and a positive final evaluation was obtained, the students were assigned to specific project teams and were coached by on-the-job tutors, who closely monitored their progress.
2. The conclusion of Engineering's first Project Management Master's (MPM) program for 35 of the Company's Senior Project Managers, during which, in addition to the training required to obtain the prestigious PMP certification, comprehensive training on what is currently expected from Project Managers (PMs) on an operational level was also provided, with particular regard to the management team, the project and customer

management strategy, and the proper analysis and management of the contract and risks. The Master's program is also highly focused upon the corporate context, and even includes evening fireside meetings with the company's management.

3. The launch of complete e-learning courses, for all the Group's employees, on institutional matters and topics of general interest, such as the introduction of new communication, collaboration and sharing tools, and the company's Quality System. Accessible at any time through the ForENG Learning Management System, these educational tools will help support the Company's organizational changes by ensuring the effective and large-scale dissemination of key content.
4. Educational activities, involving the use of both classroom training and e-learning methods, aimed at allowing the Group's personnel to obtain professional certifications for the main IT technologies and methodologies. Thanks to these activities, the Group's employees underwent more than 850 certification exams in 2017, in order to obtain major certifications, such as PMP, ITIL, SCRUM, CBAP, Prince2, Microsoft, Oracle, SAP, Cisco, VMware, and more. These results were also possible thanks to the Ferentino School's accreditation as an official Testing Center, and the ongoing refinement of the intensive courses specifically designed for exam preparation.
5. The seminar series titled "Innovation Tuesdays", held at the "Enrico Della Valle" School, which were focused upon topics of particular interest and current events relating to the world of Information Technology. The seminars illustrated the Digital Transformation's main characteristics and potential impacts upon the business: from the new frontiers of artificial intelligence, to the evolution of the Brand Identity in the era of social media, and the company's innovation management strategies.
6. The corporate orientation program for young peo-

PARTICIPANTS BY COURSE TYPE

	2016	2017
Total participants*	4,739	4,546
Technological	1,281	1,614
Project Management	453	432
Methodological	1,255	1,137
Industrial development	672	796
Out-of-catalog initiatives (MeM, apprenticeships, etc.)	1,078	568
Person days/training internal pupils	14,078	14,631

* Classroom courses.

ple hired with apprenticeship contracts, which is structured into specific residential training courses aimed at illustrating the history, values and founding principles of the “Engineering culture”, as well as developing communication and teamwork skills. During the course of 2017, 217 participants took part in the initiative, which includes training courses during the first and second year of apprenticeship.

7. The training activities conducted on the premises of external bodies, in which a total of 337 employees took part, consisting of training courses and conferences in the field of Methodology and Technology and Project Management, held in Italy and other European countries.

Towards a new School model

The provision of residential training courses for its staff has always been a specific methodological and cultural choice adopted by Engineering. Not only does it guarantee the highest quality standards in terms of teaching and instruction, but also, and above all, it allows the School to become a physical place where the course participants, who come from all the Company’s locations and organizational structures, can exchange knowledge and experience, learn the good practices developed by other working groups, and get to know different business realities.

In short, for Engineering, the School represents a powerful means of disseminating the company’s general culture and knowledge, and its value extends well beyond its basic educational purposes. In recent years, however, the company’s significant and continuous growth, even in terms of number of employees, has posed new challenges for the School, starting with the need to change its teaching model in order to better and more efficiently respond to this growth, while at the same time

maintaining and safeguarding the enormous added value of the residential training model.

In particular, the ForENG Learning Management System, which was introduced in 2016 and is capable of providing all the information relating to the company’s training activities (training catalog, individual courses, educational calendar), both in real time and on the move, continued to be consolidated during the course of 2017.

Therefore, through ForENG, the School’s training model is quickly moving towards an offering in which classroom learning is being increasingly integrated and enriched with high-quality distance training options, with the possibility of deciding the topics upon which to continue receiving updates, even on the move, thus allowing each employee to schedule and select their training activities more easily and effectively.

For the Group’s employees, the platform represents the point of access for participating in the courses, as it automates all the coordination and logistical activities associated with the training activities themselves.

In 2017, Engineering bolstered the system by allowing employees to manage the operating methods for taking part in the training activities, as well as by providing them with direct access to the contents as well.

This strategic focus stems from an awareness that, in a context increasingly characterized by the ubiquity of mobile connections, the scarcity of time and the considerable availability of information, in order to achieve greater teaching effectiveness and ensure the sustainability of the numerous training initiatives offered, each employee must be given the opportunity to create their own personal learning pathway, based on their individual needs for greater insight into the content discussed in the classroom,

as well as for different course times and locations. The strengthening of the ForENG system is linked to the Company's pursuit of a blended approach to training, for a pathway capable of combining the use of different educational formats. The use of different communication channels (namely the classroom and the Internet), according to an educational integration strategy, will improve the quality of the training processes currently in place. In fact, some of the other advantages that the system offers include the possibility of holding follow-ups to the classroom courses, as a way to combine the two aforementioned types of training.

In addition to diversifying the training methods, while at the same time improving their effectiveness, the ForENG system also supports the comprehensive management of the courses themselves, from invitation to participation: this helps to improve the course planning and the distribution of the pupils among the various editions, thus resulting in greater efficiency, which in turn allows for more resources to be dedicated to expanding the course offering, for a virtuous cycle of improved efficiency/effectiveness.

Circular training: a value for the customer

Engineering is always on the lookout for new and sustainable ways of doing business, and sharing knowledge and know-how with customers is one of the main pillars of its market approach.

In fact, it's no coincidence that its customer training approach is associated with the pay off "We do IT. We teach IT".

This sharing is rendered even more distinctive by the fact that the projects launched on the market have always been highly personalized and unique, as they arise from the specific needs and demands of the individual customers.

During the course of 2017, this approach began to

expand in new strategic directions, above all the development of complex funded training projects on proprietary applications.

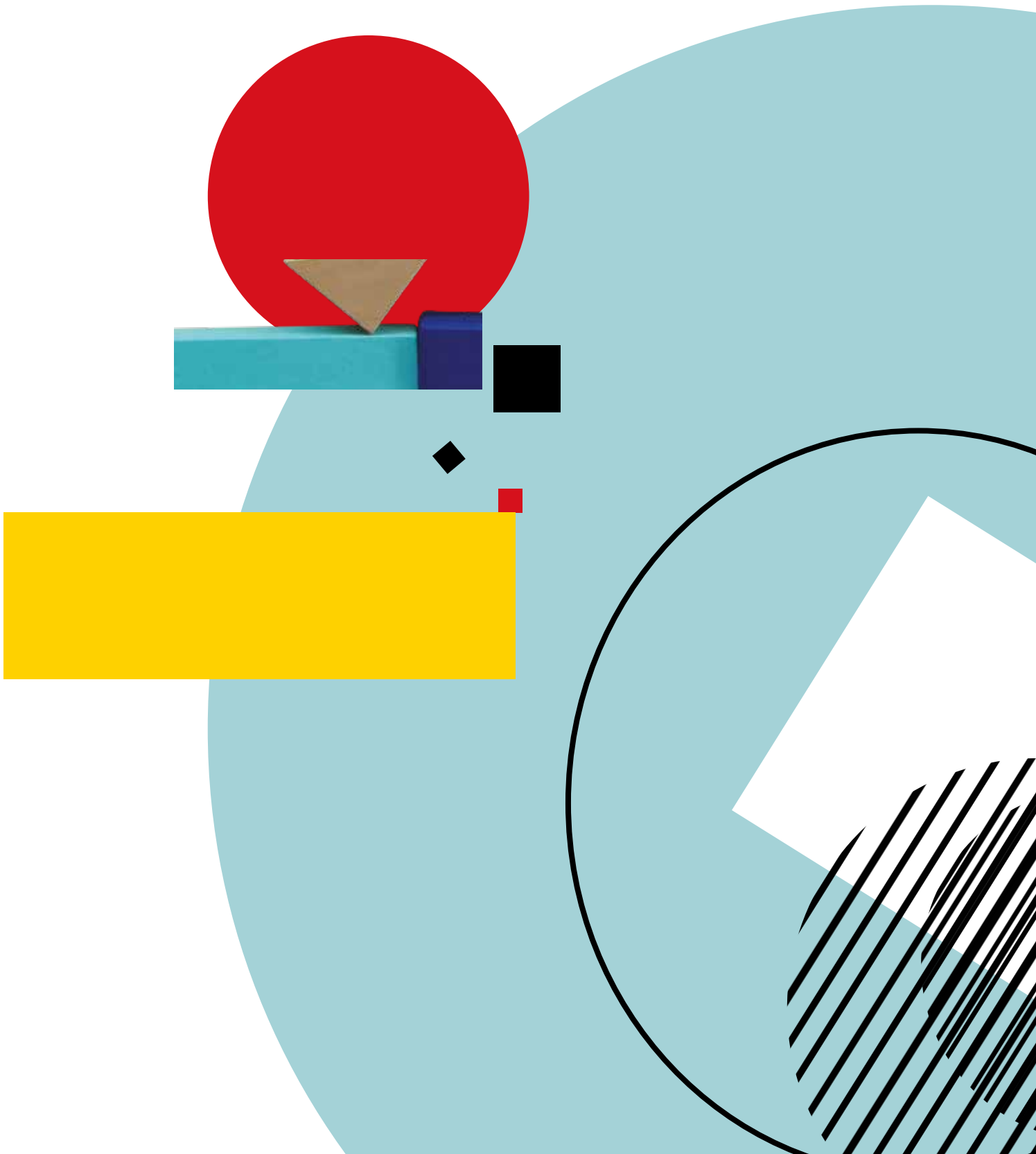
One initial pilot project, which was presented for funding to the inter-professional fund Fondimpresa, regarded training for the NET@H2O application developed by the Energy & Utilities division for companies operating on the water distribution market. The project, which involved three client companies, will pave the way for similar initiatives for client companies operating in other areas, thus allowing them to train their staff without incurring financial burdens.

Another funded training initiative resulted in a second innovative directive: In fact, Engineering was awarded a tender organized by ANPAL for a highly articulated professional program aimed at training 400 NEETs (Not in Education, Employment, or Training), in order to get them involved in the labor market in less than 18 months.

Finally, the year 2017 concluded with Industry 4.0 as the watchword in terms of training as well. In fact, the increased attention paid to Industry 4.0 technologies by the Ministry of Economic Development has led to the creation of a specific training catalog on the Digital Transformation. Touching upon all of the Calenda Plan's 9 new technologies, the catalog was successfully proposed to numerous customers operating in various product sectors.

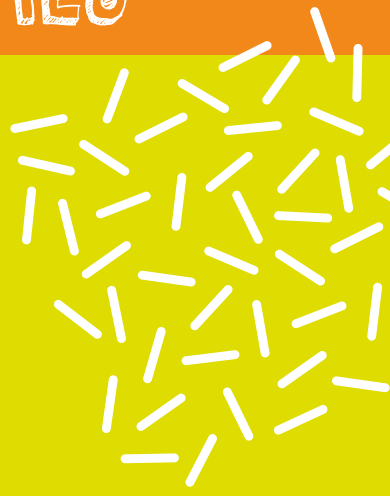
TRAINING FOR EXTERNAL STAFF

	2016	2017
External participants	2,386	1,929
Training days provided	5,929	4,060



SUPPORTING OUR COMMUNITIES

GRI 103-2 GRI 103-3



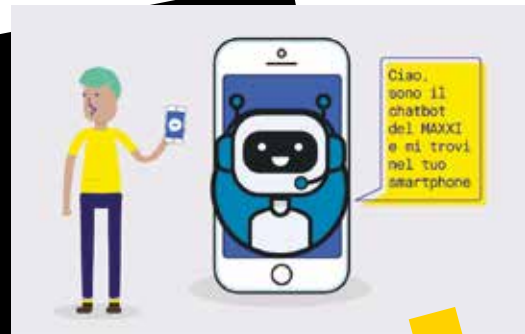
SCIENCE, UNIVERSITY, CULTURE, ART, SOCIAL

these are spheres that only appear to fall outside the realm in which a company operates. The fact of the matter is that all activities and initiatives that increase and foster the exchange of knowledge are precious tools for creating a corporate culture.

Engineering believes in the sharing of experiences and in community engagement, and therefore supports a series of initiatives in the academic/scientific, artistic and social spheres. Initiatives that arise in order to make a contribution to the territory, and to support the cultural and social growth of the country itself.

INNOVATION IS A TANGIBLE ASSET. IT RESIDES IN THE EXPECTATIONS AND THE **NEEDS OF THE COMMUNITIES** THAT BENEFIT FROM ITS DISCOVERIES, THUS BECOMING A PRECIOUS ASSET TO BE **OBSERVED** AND **SUPPORTED**. IN FACT, IT IS THESE COMMUNITIES WHO GENERATE THE DEMAND OF THE FUTURE.

INITIATIVES AND PROJECTS



Art and technology: the innovative alliance between MAXXI and Engineering

The debate regarding the relationship between art and technology dates back to the dawn of Western civilization itself.

We live in an age in which technological research is pervaded by an almost mystical quality. Today's "technological innovators" have a charm and allure once attributed exclusively to artists. Through the success of its results, the research underlying technological innovation is often seen as a process of increasing the possibilities, and of liberation. By overwhelmingly permeating the daily lives of human beings, technology has become a system in its own right, generating its own narrative, often with utopian connotations bordering on the metaphysical.

We don't know whether technology can truly liberate mankind, as is often promised. We do know, however, that it can liberate art, by allowing it to embark on new paths of research. Just think, for example, of how the possibility of having paints in tubes impacted 19th century painting, giving rise to the *plein air* method and the research and the artistic results of Turner and the Impressionists.

Technology is also generating extraordinary possibilities in terms of the accessibility and study of artworks. And the "contemporary" approach that characterizes the MAXXI Foundation's activities cannot help but explore, test, and verify the new means to be rendered available to the user.

And it is precisely along these lines that our alliance with Engineering was established, which has been maintained for nearly three years now. An alliance based on two basic assumptions. The first is the idea that even technology companies can become active supporters of culture, going beyond mere philanthropy and placing their technical expertise at the service of the arts. The second is the idea that the world of art is open and receptive to technological input, which broadens its horizons in terms of accessibility. In this sense, it is necessary to overcome a fearful and conservative logic, without giving in to an antiquated outlook.

This is the approach that has been adopted for the projects carried out by Engineering and the MAXXI Foundation, such as JACK Contemporary Arts Tv, VIRTUAL MAXXI, and the museum's Chatbot.

JACK Contemporary Arts Tv is the first international web television station dedicated to the fields and the protagonists of the contemporary arts. Managed directly by museums and institutions dedicated to modern creativity, the result is a constantly updated network of live streams, spaces for user comments, and contributions by art bloggers, as well as a section dedicated entirely to sign language videos.

The second project, VIRTUAL MAXXI, is a captivating experience, which, for over a year, has led the audi-

VIRTUALMAXXI
 Oltre lo spazio fisico, la Collezione MAXXI è anche virtuale? Con pochi e semplici gesti si può vivere una esperienza unica e immersiva. Scoprire i contenuti e i percorsi del museo attraverso i più interessanti modelli di architettura attualmente non esposti e scoprirli grazie ai grandi Maxxi attraverso i loro progetti.

5 SEMPLICI GESTI

ESPLORA
 Naviga nello spazio virtuale muovendo la testa.

SELEZIONA
 Tocca il tuo oggetto con una delle mani.

5 SIMPLE GESTURES

EXPLORE
 Move your head to navigate the virtual space.

SELECT
 Touch the object with one of your hands.

MOVE POSITION
 Move the position of the object with the right hand.



ence on the discovery of some of the most beautiful models contained in the museum's architectural collections not on display. Through the headsets provided to the visitors, the works can be observed in great detail from every angle, accompanied by a narrator's descriptions.

The MAXXI Chatbot, on the other hand, is a robotic guide with artificial intelligence designed to interact with visitors, challenging them to learn more and more. Chatting with the museum's Chatbot, visitors can head off to discover the building by Zaha Hadid, can opt to be guided along the thematic pathways dedicated to the works of Art or Architecture found in the museum's permanent collection, and, by answering its questions, can even earn Museum Coins (virtual coins that can be used to purchase tickets, catalogs, educational workshops, and merchandise).

The projects reveal how a partnership between two seemingly unrelated businesses like Engineering and the MAXXI Foundation can generate experimentation, wealth and innovation in a field like art, which is constantly besieged by stimuli and responsibility. To promote receptivity, to experiment with new museum experiences, and to engage the user in order to increase knowledge, analytical skills, and awareness: these are the priorities that a museum must pursue if it wants to place itself at the service of both the arts and its audience. This mission dedicated to experimenting, planning and innovating together is reinforced by valuable and consolidated alliances like that with Engineering. All with a single goal: to improve the basic cultural well-being of the country as a whole.

Giovanna Melandri
Chairman of the MAXXI Foundation





Forum Terra Italia: let's protect our planet

Engineering was one of the promoters of the fourth edition of Forum Terra Italia, which was held on 5 June in Bologna to mark World Environment Day. On this Earth Day, Italy wanted to offer a reflection on the main environmental events of the previous year. Maintaining a special focus on Italy, the discussion highlighted how climate change and the global environmental crisis are linked to some of the most pressing issues of our time, including the migration crises, social tensions, and the food crisis. During the course of the event, the 2017 Reporter for the Earth prize was awarded to journalists and photographers whose work on environmental issues stood out.



Engineering for Telethon

In 2017, Engineering once again sent three teams to participate in the fundraising initiative in support of Telethon, now in its sixth edition. The event, which is organized by BNL Gruppo BNP Paribas in collaboration with the Rome Marathon, took place on December 17 in Rome, and, for the first time in its history, had the Baths of Caracalla as its location. BNL's partnership with the Telethon Foundation, which has been funding the best scientific research projects on muscular dystrophy and other genetic diseases since 1990, has been in effect for over 20 years, and is one of the largest fundraising projects in Europe. In 2017, with enthusiasm and a spirit of solidarity, more than 1,200 people, united in over 150 teams, ran together in the name of research, and helped to collect over € 100,000.





STEM Gonzaga: innovation comes to the class

Always ready to provide students with the tools necessary to learn about the world of digital innovation, Engineering immersed itself among the desks of a unique institute in Sicily: the STEM (Science, Technology, Engineering, Mathematics) high school, which, in September, opened its doors to the Gonzaga Institute of Palermo, a historic Jesuit college. Inspired by American campuses, this new type of secondary school offers an enhanced scientific curriculum, which the students tackle entirely in the classroom through discussion with teachers and other classmates, with no need to bring any books home. In order to allow its students to study sciences, physics, statistics and computer science in an innovative and international manner, this “school without constraints” has decided to make use of prestigious partner organizations from both the academic world (the University of Palermo) and the field of research and innovation, like Engineering, which provides specialized professionals, know-how and research facilities.



Ingenium, the Magazine of the Digital Transformation

Founded 30 years ago as a paper publication, and having made a comeback in the form of a web magazine thanks to the partnership with Tech Economy, Ingenium is the Engineering magazine dedicated to the most innovative technological issues.

Over the years the magazine has become an informative and cultural reference point, and now aims to help people understand the innovation and changes in progress within society and the economy.

The publishing plan that drives the magazine is centered upon the topic of the Digital Transformation, and offers insights into specific phenomena like Big Data, Social Media, the Internet of Things, Industry 4.0, and the Sharing Economy. Strategic areas for companies that need to be aware of, and understand, the latest technological scenarios.

The authors of the editorial contributions published in the magazine include journalists, university professors, leading opinionists, and Engineering specialists, whose testimonials provide the ideas, visions, and interpretative tools necessary to render the publication a place where innovation-related topics can be shared and discussed.



Planning our children's future

In 2017 Engineering also supported the "Program the Future" project sponsored by the Ministry of Education, University and Research (MIUR), for the introduction of computational thinking in schools.

With over 2 million students involved, 32,462 teachers engaged, and over 30 million hours of coding completed, the project has established itself as a benchmark for the digital education of the new citizens.

Engineering rendered its own employees available as teachers for the coding activities, and even provided several schools with 3D printers.

The Engineering volunteers conducted lessons at schools in various cities, using tools and programming environments like Scratch (for beginner coding and storytelling), ApplInventor (as an introduction to mobile app development), Utility 3D (for videogame development), and M-BOT (as an introduction to robotics). A seminar on videogame development was also held for university students, in collaboration with the University of Salerno. For the Work/Study Alternation, the volunteers launched a pilot initiative at the Orazio high school in Rome: a three-year project that entails an introduction to the digital world, in-depth mobile programming education, and experiences in the field of educational robotics.



Socially Made in Italy: a second possibility for materials and people

The reuse of recycled materials is a good environmental practice, and if the materials are processed by prisoners as part of a reintegration project, this can have a positive impact upon society as well.

This has been demonstrated by the Socially Made in Italy project promoted by the Alice cooperative, which Engineering supports by sending the PVC materials used during events, seminars, trade fairs, and career days.

The materials were then processed by the prisoners at the Venice penitentiary, who transformed them into fashion products (shopper bags, purses, and eco-friendly items) bearing the Engineering brand name.

In 2017, in collaboration with the Rio Terà dei Pensieri Cooperative, the company even decided to create an exclusive line of bags under the "Malefatte" brand name, which features the drawings made by the children of the company's employees for the "My Selfie" Christmas initiative. The funds raised from the sale of these bags will support the activities of an orphanage in Calcutta.

The production system coordinated by the Socially Made in Italy project is certified by Sigillo, a trademark of the Ministry of Justice and the first national agency dedicated to coordinating the business endeavors of female prisoners and a new sustainable economy model.



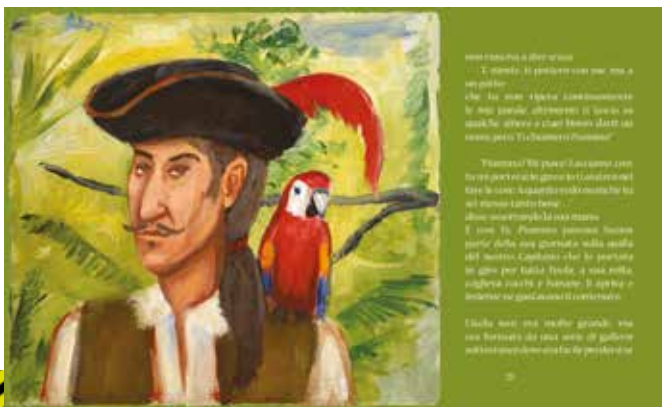


The diversity of Captain Hook: "Together for the Meyer - 3rd edition"

"Captain James finds the treasure!" is a fairy tale about the legendary character Captain Hook, from the story of Peter Pan.

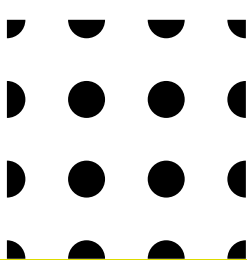
It's an imaginative story conceived for a fundraising project in support of pediatric onco-hematology at the Anna Meyer Hospital in Florence. Who was Captain Hook before the crocodile ate his hand? Faced with a situation of "diversity", what feelings led him to overcome his limits and become a legendary character?

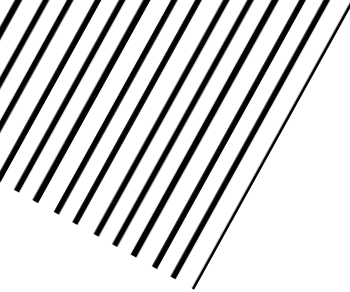
The book, which was published in collaboration with Engineering, aims to facilitate a dialogue with the reader/child about all types of diversity, and to stimulate reflection on one's own experience through simplicity, lightness and humor.



IG4U 2017: the business game for talented university students

A business simulation platform. Nine teams of Management Engineering master's students. A two-day challenge to determine which was best at managing a virtual company. In 2017, Engineering once again renewed its support for IG4U, the university business game designed to bring out and support new talents in the fields of economics and management. In June, during the various stages of the simulation held at the Federico II University of Naples, Engineering's HR Managers even acted as mentors for the teams of students selected from eight Southern Italian Universities (the Polytechnic University of Bari, the University of Calabria, the University of Palermo, the University of Salerno, the University of Catania, the "Federico II" University of Naples, the "Tor Vergata" University of Rome, and, for the first time, the "Parthenope" University of Naples). Once the contest was over, the 45 participants had the opportunity to get to know one another through a quick, interesting and effective 3-minute presentation.





The Red Devils of Varese Rugby: when inclusion wins

Côte d'Ivoire, Guinea, Albania, Peru, Mali... borders don't matter on sports fields. As of 2017, the Varese Rugby league welcomed the Red Devils, a team made up of athletes of various nationalities, all of whom are living in Italy as asylum seekers. As an official sponsor of the team, Engineering has decided to support this initiative in order to reaffirm its support for organizations that are capable of making inclusion a point of strength and awareness.

The Red Devils participate in the C2 federal championship league, and faced the Casal Monferrato Three Black Roses (another multi-ethnic team established in 2015) in a friendly match last December.



Race for the Cure: #PinkEveryDay

Engineering runs alongside the women in pink. The first stage of the 19th edition of the Race for the Cure, the symbolic Komen Italia event that's been raising funds for the fight against breast cancer since 2000, was held at the Circus Maximus in Rome from May 17th to 20th, 2018. Each year, the event provides a venue for women who have faced or are currently facing the disease to share their experiences.

The event is also an opportunity to engage families, schools, companies and athletes in a long weekend of initiatives dedicated to health, sports, and wellness, all culminating in the traditional 5-kilometer race and 2-kilometer walk.

With over 280 employees participating, the Engineering Team was recognized as the most numerous of the corporate groups registered at the event for the first time. The Company's team will also be present at the other two stages of the 2018 Race for the Cure: Bologna (September 21st/23rd) and Brescia (October 5th/7th).



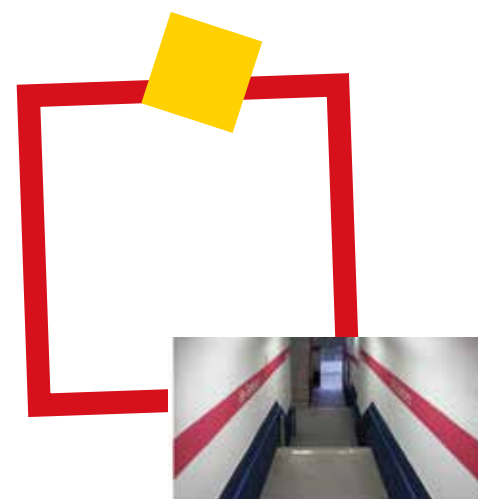


Growing up and post: becoming grown ups without falling victim to the Internet

Like a sport, the Internet has its own rules. In order to learn about them and how to use them, the Pino Dragons Basket Firenze basketball club and Engineering have launched a joint initiative titled Growing up and post - becoming grown ups without falling victim to the Internet. On April 30th, during the Tournament titled International Brothers & Sisters in Basketball - Engineering Cup 2018, VIII Memorial Pietro and Niccolò Quercetelli, a talk show was held with several big names from the Italian basketball scene (including Reyer Venezia coach Walter De Raffaele and referee Lorenzo Baldini) and psychotherapist Alberto Rossetti, who, together the teams' players, discussed several issues relating to the use of smartphones and social media, ranging from privacy protection to cyberbullying.

Engineering also created the *crescioposta.it* website, which, for four weeks, gave the players for the teams participating in the tournament the opportunity to read, post, and discuss various topics regarding proper online and offline conduct. Hundreds of posts and reactions were collected, many of which were in reference to the videos posted by basketball greats like Danilo Gallinari of the Los Angeles Clippers, and Andrea Zerini of Sidigas Avellino.





ENGINEERING BRINGS NAPLES “INTO THE FUTURE”

A project intended to create shared value for the well-being of the employees and the redevelopment of the territory

There are over five hundred Engineering employees who work at the company’s facility on Via Gianturco in Naples, most of whom use the Circumvesuviana railway line every day.

Devoid of security and qualified personnel, the railway stop near the company’s facility had become somewhat rundown in recent years.

With a constant commitment to projects aimed at improving cities and people’s lives, and with particular regard to its own employees, Engineering devised and funded a redevelopment project, in collaboration with

EAV (Ente Autonomo Volturno), dedicated to rendering the area cleaner and more secure, and therefore safer for everyone, including its staff, who are now able to commute to the workplace with greater peace of mind.

In particular, Engineering renovated and modernized all the interior structures, equipping them with surveillance and security systems, and will sustain the relative maintenance costs for the next three years. These extraordinary maintenance activities for the station’s redevelopment have allowed it to be re-appropriated by the territory and the citizens.





But the renovation efforts on Via Gianturco weren't just aimed at making the train station feel safer; they also transformed it into a work of art that brings Naples "Into the future."

In fact, this is the title of the mural painted on the station's outer walls by Geometric Bang, an artist from the Italian province of Lodi who's been among the most highly regarded mural painters on the international scene for over ten years.

The work consists of a pop-up style mural from which the city of Naples emerges, boasting a perfect balance of the natural and cultural beauty of the past, with the allure of an innovative and sustainable future.

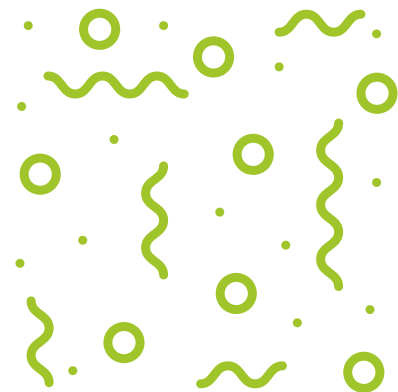
Mount Vesuvius, the Castel Nuovo, and the Duomo are all present, among urban escalators, hover cars, and condominiums with miniature wind energy systems. "This mural," the artist explains, "depicts a city that's more livable and sustainable for those who frequent it every day. A Naples that's more technological and uses renewable energy, and is even green, with trees growing on the buildings' rooftops. In short, a city that's much more useful to mankind."



Video Story

RESPECT FOR THE ENVIRONMENT

GRI 102-8 GRI 103-2 GRI 103-3 GRI 302-1 GRI 305-1 GRI 305-2
GRI 306-2 GRI 404-2



HIGHLIGHTS 2017

177,784 ● GJ total energy consumption (-3.2% compared to 2016)

14,819 ● tons of CO₂

25,955,000 ● miles traveled by the company's fleet

2,293,916 ● liters of diesel consumed by the company's fleet

145,1 ● g of CO₂ emitted per mile by the company's fleet
(-7% compared to 2016)

18.83 ● GWh in Data Center electricity consumption

1.63 ● Group PUE

IN THE AGE OF SUSTAINABILITY, **A COUNTRY'S MODERNIZATION** ENTAILS THE **PROTECTION OF ITS TERRITORY** AND ITS PEOPLE. IN FACT, IT IS ONLY **BY PROTECTING THE ENVIRONMENT** THAT BUSINESSES CAN DESIGN A **NEW COMMON EXISTENCE.**

ENVIRONMENTAL IMPACTS OF THE COMPANY'S BUSINESS

Engineering is not a manufacturing company, so its impact on the environment is attributable to its 4 Data Centers in Pont-Saint-Martin, Turin, Milan, and Vicenza, and its roughly 50 Group offices present throughout Italy and worldwide, which have an environmental footprint similar to that of urban users, mainly involving waste, power and water.

Despite this, the parent company Engineering Ingegneria Informatica has implemented its environmental management system certified according to the international standard ISO 14001, which also covers the subsidiaries Municipia, Engineering D.HUB and Engiweb Security, headquartered in Naples, Palermo and Rome.

The main environmental impacts attributable to the Engineering Data Centers consist of electronic waste production and electricity consumption. The main energy consumption at the Data Centers comes from the computer equipment, the cooling systems, the ventilation systems, and the electrical distribution systems. The Data Centers also manage the information technology infrastructure upon which the Group's approximately 50 Italian offices rely for their remote activities. One last element to be considered in calculating environmental impact is that derived from atmospheric emissions, resulting from the travel of personnel and the water used for cooling at the Pont-Saint-Martin Data Center.

Pont-Saint-Martin and Vicenza: the points of excellence of the green Data Centers

The Data Center at Pont-Saint-Martin, in Valle d'Aosta, was created in 1998, employs about 350 resources and houses the main service and governance hub of the Engineering Group's IT activities, with the management of more than 7,000 physical and virtual systems.

This is an example of a state of the art plant in Italy in terms of environmental sustainability. In 2011,

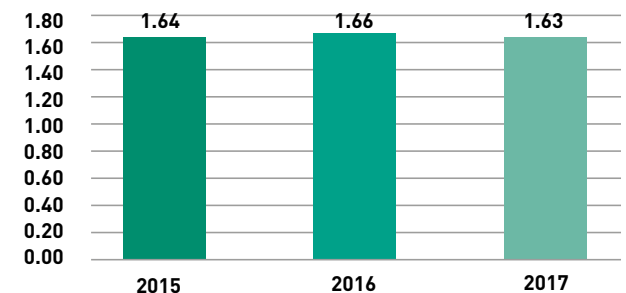
a geothermic system inside the plant was inaugurated, which supports the cooling systems on which the Company commissioned an executive expansion project undertaken in 2016. The geothermal plant provides for the use of low-temperature water, taken at a temperature of 13 degrees from two wells specially built at 40 meters' depth, which is then further cooled to about 7 degrees. The plant sends the water to the Data Center cooling systems, with a positive effect upon energy savings quantified at a 12% reduction, i.e. 1.3 GWh since 2013. The building has a control room, bunkers and various utilities: electricity, geothermics, refrigeration plants, plant management and control system (fire,

WATER

	2015	2016	2017
Groundwater extraction* (millions of m ³)	1.19	1.17	1.16
Discharges of industrial cooling wastewater (millions of m ³)	1.19	1.17	1.16

* The water collected is only for cooling the Pont-Saint-Martin Data Center and is not subjected to any industrial process other than the change in temperature; the increase in the flow rate has no significant impact upon the environment. The return temperature of the water in the Lys river complies with the regulations stipulated in the disciplinary rules of the concession of the Region of Valle d'Aosta.

PUE OF THE GROUP'S DATA CENTERS*



* The Group's average PUE for 2016 was calculated excluding the Data Centers in Rome, which as of 2016 is entirely owned by the customer ADR, and in Assago, which was sub-leased to the company Infracom with the full management of engineering activities; since 2016, Engineering has only managed two rooms under co-lease, plus a TLC room whose energy consumption is indicated in the table, but the consumption of the absolute continuity and air conditioning systems (ICT consumption), upon which PUE is based, cannot be estimated.



safety, electrical, technological) and fire extinguishing plant for technological systems. With reference to the enlargement project, Engineering has recently been awarded a concession to increase the collection and return of ground water.

In 2017, the Pont-Saint-Martin Data Center reached a PUE (Power Usage Effectiveness, the measure of energy sustainability) of 1.52. According to the standard definition by the international body The Green Grid, this parameter indicates the ratio between data center's overall electrical consumption (air-conditioning, ventilation) and the consumption of the IT equipment alone. In order to have an efficient level of consumption, a data center's PUE must be below 3. A value of 2 represents a high level of efficiency, while values around 1.5 are considered to be excellent.

In the first few months of 2017, the Vicenza Data Center was awarded the Uptime Institute's highest level of certification, moving up from TIER III to TIER IV level, both for the initial phase of design and

for the final phase of implementation and on-site post-verification. TIER IV represents the greatest level of assurance that a data center can offer, with an availability of 99.99%.

The Data Center is entirely outfitted with redundant electrical, cooling, and network circuits, and is capable of simultaneously maintaining high levels of energy efficiency (PUE equal to 1.61 in 2017) and system reliability thanks to free-cooling solutions and structural precautions, including the separation of the data center rooms from the outdoors by insulating corridors. This architecture enables the detection and isolation of any damage to the structure's systems, while supporting and maintaining active all the IT loads and business critical systems of the clients hosted within the structure.

Moving people

In 2017, Engineering's personnel traveled more than 25 million miles throughout Italy⁶. This significant figure confirms the Company's philosophy of con-

GROUP DATA CENTER ENERGY CONSUMPTION*

Data Center	Pont-Saint-Martin			Turin			
	Year	2015	2016	2017	2015	2016	2017
Electricity consumption Gigawatts/hour		11.90	11.55	11.51	2.00	1.95	1.94
Electricity consumption GigaJoules		42,840	41,600	41,400	7,200	6,990	6,960
Power Usage Effectiveness (PUE)		1.53	1.53	1.52	1.80	1.80	1.80

Data Center	Vicenza			Assago			
	Year	2015	2016	2017	2015	2016	2017
Electricity consumption Gigawatts/hour		2.82	3.08	3.22	3.29	2.03	2.16
Electricity consumption GigaJoules		10,141	11,088	11,592	11,832	7,308	7,776
Power Usage Effectiveness (PUE)*		1.60	1.61	1.61	1.90	n.a	2.35

* The Assago Data Center was sub-leased to the company Infracom which manages all engineering activities; Engineering only manages two rooms under co-lease, plus a TLC room whose energy consumption is indicated in the table, but the consumption of the absolute continuity and air conditioning systems (ICT consumption), upon which PUE is based, cannot be estimated. The Rome Data Center is managed by Engineering, but is exclusively dedicated to the customer ADR, which supplies electricity on a flat-rate basis.

⁶ Miles traveled estimated based on average annual mileage bands provided by the leasing company.

stantly remaining in close contact with its roughly 1,000 customers. This movement was enabled by the company's fleet, which consists of over 1,000 vehicles on long-term lease. In 2017 the car fleet increased by more than 50 units, as did the average distance traveled per vehicle, which grew from 20,900 to over 21,500 miles per car.

The company's policy on staff movements places special emphasis on fuel consumption and emission limits. In fact, Engineering's objective is to reduce the average fuel consumption threshold, thus resulting in a decline in CO2 and other pollutant emissions as well.

This target was reached in 2017, as shown by the reduction in the average consumption in liters per car, which decreased from 1,861 liters in 2016 to 1,790 in 2017.

This reduction in consumption also resulted in a lesser environmental impact in terms of grams of CO₂ emitted per mile, which decreased from 249.9 in 2016 to 232.7 in 2017.

In early 2013, a new leasing policy was approved, which entails an obligation for the first band of cars (for middle management and office employees) to limit consumption to below 4.2 liters of fuel per 62 miles on the combined cycle. The second level (upper middle management and executive managers) have a limit fixed at 4.6 liters per 62 miles.

In 2017 Engineering introduced hybrid and full-electric cars to its car-list, which are primarily intended for urban drivers who do not exceed the threshold of 9,320 miles per year. The orders for cars powered by fuels other than diesel exceeded 15 units.

Our commitment to electronic waste management

GRI 306-2

The matter of collecting and disposing of electronic waste regards in particular the Group's Data Centers and the replacement of the systems inside them. In 2017, the components replaced amounted to 11.98 tons. In order to minimize their impact on the environment, all electronic waste produced is initially analyzed at the Group's two storage centers in Rome and Pont-Saint-Martin, and is then transferred to specialized and certified firms for the proper recovery of the materials. The sustainability of electronic waste at the Data Centers is guaranteed by the fact that it is for the most part reused in other industrial sectors.

In addition to the Data Centers' replacement parts, the computers used in the Group's offices represent another category of electronic waste. In order to better optimize their management, Engineering has implemented a virtuous system in the Italian offices that, on the one hand, makes it possible to contain the costs of purchasing new PCs, and, on the other hand, has a more limited impact on the environment, with a lower average standard production of electronic waste linked to PC replacement.

For many years now, Engineering's Technological Infrastructure Services (SIT) office has been operating a dense and highly efficient network dedicated restoring damaged computers by simply replacing their components, just as might happen within a mechanical workshop. This is an example of how an approach to sustainability can even generate a reduction in business costs.

ELECTRONIC WASTE

	2015	2016	2017
Tons produced	37.38	39.82	11.98
<i>of which:</i> Given to specialized and certified companies for proper disposal	37.38	39.82	11.98

CORPORATE FLEET DATA (ITALY)

	2015	2016	2017
Miles traveled	24,500,000	24,125,500	25,954,500
Diesel Consumption (Tons)*	1,926	2,017	1,921
Diesel consumption (GJ)	83,032	86,452	82,484
CO ₂ (Tons)**	5,999	6,063	6,061
g CO ₂ /Km	152.1	156.2	145.1

* Data calculated using fuel costs per year divided by the average consumer price of diesel (2013-2016) provided by the Ministry of Economic Development.

** Diesel emission factor 3.006 tCO₂ /t fuel. Source: ISPRA - Italian National Institute for Environmental Protection and Research, database of average emission factors of road transport in Italy.

ENERGY CONSUMPTION AND CO₂ EMISSIONS OF THE OFFICES*

GRI 302-1

	2015	2016	2017
Electricity consumption (Kwh)	7,376,845	8,398,321	7,658,864
Electricity consumption (Gwh)	7.377	8.398	7.659
Electricity consumption (GJ)	26,557	30,233	27,572
CO ₂ Emissions (t)**	3,002	2,645	2,532

* The data does not include all the locations, just the main offices in Italy. The reported Kwh values do not include the few "temporary offices" where all inclusive services are offered (including electricity).

**2017 data conversion factor: 330.6 grams CO₂/Kwh Source: ISPRA 2017.

DATA CENTER ELECTRICITY CONSUMPTION

	2015	2016	2017
Electricity consumption (Kwh)	22,200,000	18,610,000	18,830,000
Electricity consumption (Gwh)	22.2	18.61	18.83
Electricity consumption (GJ)	79,905	66,986	67,728
CO ₂ Emissions (t)*	9,035	5,862	6,225

* 2017 data conversion factor: 330.6 g CO₂ xKwh (Source: ISPRA 2017).

CO₂ EMISSIONS AND TOTAL ENERGY (ITALY)

GRI 305-1 GRI 305-2

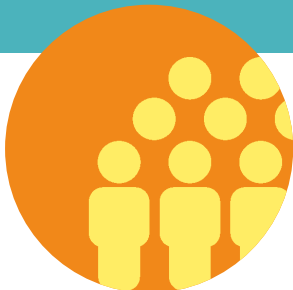
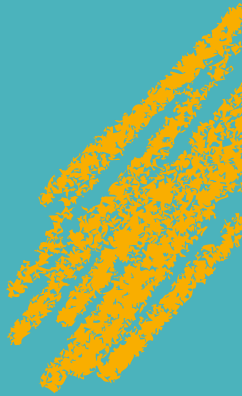
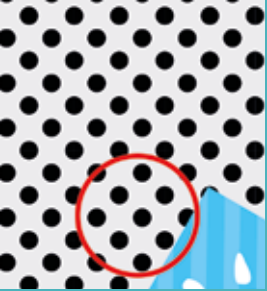
	2015	2016	2017
Total energy consumption (GJ)	189,494	183,671	177,784
CO ₂ Emissions (t) [Scope 1]*	5,999	6,063	6,061
CO ₂ Emissions (t) [Scope 2]	12,050	8,508	8,757
Total CO ₂ Emissions	18,049	14,571	14,819

* Consumption and CO₂ emissions of the company's car fleet.

A MORE MODERN SOCIETY

AT THE SERVICE OF THE CITIZENS

GRI 103-2 GRI 103-3 GRI 203-1 GRI 203-2



-  PUBLIC ADMINISTRATION AND DIGITAL HEALTH ON THE SIDE OF THE CITIZENS
-  SMART CITIES FOR A BETTER LIFE
-  THE DIGITAL TRANSFORMATION OF BUSINESSES
-  DATA SECURITY
-  THE EUROPEAN CYBER SECURITY PROJECTS
-  WHEN INNOVATION BECOMES ECO-SUSTAINABLE

A **MORE EFFICIENT GOVERNMENT**, A MORE STREAMLINED BUREAUCRACY, **SMART CITIES**, AND **CUTTING EDGE BUSINESSES**: THESE ARE **TRUE STORIES** TOLD WITH THE VOICE OF **INNOVATION**. BECOMING REPEATABLE EXPERIENCES, WHICH REVOLVE AROUND THE **REQUIREMENTS OF CITIZENS** AND THE **NEEDS OF ORGANIZATIONS**.

PUBLIC ADMINISTRATION AND DIGITAL HEALTH ON THE SIDE OF THE CITIZENS



- 40** **LARGE CENTRAL PA CLIENTS**
(Parliament, Ministries, Central Authorities, Security Bodies, and Defense)
- 90%** **OF THE ITALIAN REGIONS**
have chosen Engineering as their technology partner
- 1/3** **ITALIAN MUNICIPALITIES**
uses Engineering solutions to manage Local Taxation
- 50** **MILLION RESERVATIONS**
CUP OFFICES managed
- 55** **MILLION LABORATORY EXAMS**
supported
- 4** **MILLION EMERGENCY ROOM**
admissions handled
- 3.5** **MILLION PAYSLEIPS**
processed (equal to 40% of the public Health system)

Public Administration and Health are the government's main frontiers in terms of citizens' needs. The former guarantees that all the government's functions are operating properly, while the latter ensures health care, an essential element of protection in people's lives.

While their functionality is complex, and is often bound to the rules of bureaucracy, the efficiency of the

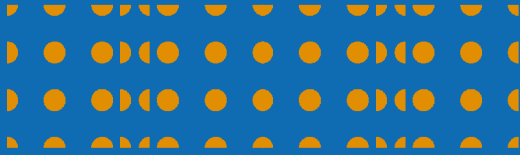
gears that drive these mechanisms remains essential for the citizens. Digitalization is the most effective tool for tackling this difficult challenge, and is the only one capable of modernizing the processes and giving rise to what is commonly referred to as smart government and e-health.

With an integrated offer of projects, products, services and consulting, Engineering has been the go-to technological partner for Public Administration and Electronic Health in Italy, at the central, regional and local levels of government, for over thirty-five years, promoting digitalization in all its dimensions. Bolstered by its profound knowledge of the public machine's mechanisms and the expertise that it has acquired over the years, the Group makes an important contribution to the development of the main information systems in the sectors that play a primary role in the Country's functionality, serving as a strategic partner for their design, realization, maintenance, and development.

The legislative and organizational innovations that have ensued over the years for the Public Administration have been accompanied by changes to the relative IT platforms, with particular regard to the dematerialization of the procedures, digital identity, electronic payments, administrative transparency, and online services for citizens and businesses.

The applicative cooperation between the PA's various systems and the participatory design of the services are aspects that have become strategic for the preparation of a public machine inspired by the principles of efficiency, effectiveness, and affordability.

The focus on communication and relationships with users (Citizen Relationship Management), the involvement of operators and citizens/users to identify needs and check usability starting from the very first design phases (User Centered Design) and strategic consulting on the digitalization of processes, organization and skills (Digital Transformation), concretely represent



how the change under way in the design and development of digital innovation in the PA is interpreted.

The Group supports most of the Central Public Administration bodies in charge of key issues for the Country's functionality: Parliament, Ministries, Central Authorities, Security Bodies, and Defense. Engineering's technological and process know-how sustains numerous major projects funded by the Ministries of the Economy, Justice, Labor and Social Policies, Health, Infrastructure and Transport, Cultural Heritage and Activities, and Tourism, as well as the Court of Auditors or the Council of State, and even extends to "authorities" of ever-increasing importance, such as the Authority for the Supervision of Public Contracts and Consob. Many of these projects fall within the complex and specific domains of the various bodies, such as the management of financial resources, judicial proceedings, control of spending, and protection of assets.

With regard to welfare, Engineering boasts a consolidated partnership with INPS and INAIL, for which it even develops and manages the vertical systems for managing the procedural aspects of the processes and verifications, and the algorithms for calculating the individual positions or insurance premiums. Last but not least, the company provides technological support to the Internal Security and Defense sectors through its collaboration with the Ministry of the Interior, the Ministry of Defense, and Public Security forces: bodies that are becoming increasingly involved in international collaborations, for which digital tools are indispensable.

With regard to Local Public Administration, Engineering has 800 resources dedicated to the Digital Transformation of the Regions and Municipalities every day, with over 170 large projects in progress. Within this segment, Engineering is partnered with most of Italy's Regions and large Municipalities, such as Rome,

Milan, Bologna and Naples. The Group offers these customers technological and organizational expertise in every thematic area (health, welfare, public finance, education, tourism, environment, culture, and transport) and process area (accounting and human resources, document management and storage). Recognized skills that accompany tens of large local bodies each day in their implementation of the Digital Agenda for citizens and companies.

The Group has recently established a new company called Municipia, which is dedicated to outsourcing services, and operates within the scope of the processes of the strategic activities conducted by the Local Authorities and their subsidiaries. All the activities dedicated to the Municipalities have been merged within Municipia and entrusted to 450 employees at 15 operational locations throughout Italy, with 4 centers of competence, 3 software laboratories, and a service center for the design and construction of the cities of the future, with a comprehensive and innovative range of solutions for Citizens, Local Economies and the Environment based on open source standards, outsourcing services, and operational and strategic consulting. Municipia manages essential services for Municipalities by investing in the management risks, using project financing and contributing with economic, professional and technological resources.

Municipia is widely recognized as an expert in the management of local taxation using on services and systems aimed at improving the Institutions' revenues with maximum effectiveness and fairness: Municipia's solutions are used by 1 out of 3 Municipalities, and allow them to guarantee the funding of local public services through the proper functioning of tax services. Municipia is a leader in rooting out tax evasion within the local and national taxes and thanks to its solutions 6 Italian Municipalities have been able to collect roughly € 100 million over the past three years.



▶ THE DIGITAL TRANSFORMATION IN THE HEALTH SECTOR: THE TUSCAN EXPERIENCE (ESTAR)

by LAURA ARRIGONI

The digitalization of the health sector is a fundamental step to improving the cost/quality ratio of the services provided to the community, above all in an economic and social context where limiting waste and inefficiencies, and reducing and eliminating inequalities between various local areas, are priorities to be pursued and finalized. Within the scope of the Projects Division, ESTAR's Complex Operational Unit - PMO Health Projects deals with technological innovation for health-related software applications (Electronic Medical Records, First Aid, Laboratory Diagnostics, Medically Assisted Reproduction, Clinical Networks, Territorial software). The Projects Division makes use of the consulting offered by ESTAR's Infrastructures Division, which issues guidelines on the use of technologies. SWOT analyses are typically used to support the design choices and market evaluations (e.g. Gartner), in order to compare the technological solutions, without prejudice to the public selection procedures. Since 2016, following the reorganization of the Tuscan Health System, which entailed the merger of 12 Lo-

cal Health Offices into 3 covering a large area, the strategy has been conditioned by the need to equip the new Local Health Offices with a single-instance software application, at 3 locations that are still using multiple applications. Many of the projects thus consists of the implementation and commissioning of centralized applications for the Local Health Offices, an operation that's usually accompanied by a technological update. At the same time, ESTAR is carrying out a plan to deploy Electronic Medical Records at all Autonomous National Public Service Agency (AASS) locations, with the aim of obtaining significant coverage by the year 2019, and favoring the use of a software application developed by the Regional Health System.

Electronic Medical Records are an example of a Digital Transformation solution that makes use of various interoperable software applications to computerize complete treatment pathways, an aspect that's had a considerable impact in recent years upon the efficiency and effectiveness of the activities and the ability to resolve social needs and challenges in the field of healthcare.

Another example of ESTAR's digital innovation is

The healthcare systems of most Western countries have undergone significant changes in recent years due to the need for new models capable of sustaining (as a priority) the progressive aging of their populations and the prevalence of chronic diseases. This is combined with a growing expectation of "quality of care" and engagement (empowerment) by citizens/patients.

Engineering sees Information Technology in Healthcare as an increasingly "enabling" and "balancing" element with respect to these changes.

Each year, the Group's Healthcare application solutions are used by over 100,000 doctors, nurses and administrative professionals at major healthcare or-

ganizations throughout Italy; by way of example, and on an annual basis, this consists of the management of over 50 million bookings, 55 million laboratory tests, 4 million emergency room admissions, and the processing of approximately 3.5 million payslips for Italy's public healthcare workers (40% of the total).

In addition to the widespread presence of its solutions within most Local Health Offices and Hospitals, the Group's know-how has allowed Engineering to play a leading role as a technological partner of the Ministry of Health and numerous Regions, on many large eHealth projects. Projects ranging from the 118-112 emergency networks, to the CUP offices, the

the ACOT project, which manages cases of complex discharges from Hospitals and their handling nationwide, making use of three software applications (Electronic Medical Records, Territory Hospital Continuity Agencies, Territorial Management), all without the need for any data to be reentered, thanks to the interoperability of the applications themselves.

Finally, projects dedicated to online and app-based reception, payments, and medical report collection have also been completed, which simplify the processes for the patients, while at the same time regulating and organizing the workflow for the operators. As far as the future is concerned, the healthcare innovations that we expect to see in the coming years as a result of the Digital Transformation range from the management of clinical networks on a regional basis (e.g. Medical Assisted Reproduction) to the management of the treatment pathways for chronic diseases.

The modernization of the doctor/patient relationship will play a key role: the technologies and operators will have to evolve rapidly in order to create an infrastructure that allows for the real circularity of the

data and the dematerialization of the processes, naturally in full compliance with the legislation.

Although the Region of Tuscany is among the most active on the Italian Healthcare scenario in terms of digitalization, from our perspective there still appears to be ample room to improve this aspect and to render the performance of the various Regions more uniform on a national scale.

Among the political and regulatory initiatives capable of supporting this process, it would certainly be useful to establish objective parameters regarding the resources and funds allocated to the ICT, indicating the economic values of the investments in technologies and people that the Autonomous National Public Service Agencies (AASS) must report: in recent years, faced with an ever growing demand for technology, the budgets and human resources have all too often been reduced, and this trend must be reversed by raising awareness among the policy makers.

Laura Arrigoni

Director of UOC PMO Healthcare Projects for ESTAR Tuscany (the Regional Technical-Administrative Support Organization)

multi-channel regional portals, and the administrative governance systems in support of networks of diseases, as well as the implementation of large infrastructure projects, like those concerning Electronic Health Records and Unified Registries.

● **CHILD BIRTH BONUS** ● **DIGITAL SOLUTIONS** ● **FOR PERFORMANCE MANAGEMENT**

The demographic decline in Italy has now become a worrisome reality. And this trend will continue as we move into the future. In fact, according to ISTAT's forecast, by 2065 our country will have 6.5 million fewer in-

habitants than in 2017, with an average age that continues to increase, peaking between 2045 and 2050 at 5 years of age greater than the current average. All this will make it difficult to balance the State's accounts, above all due to the overwhelming impact of pension expenditures, which will be difficult to sustain from a public budget standpoint. This is why measures aimed at boosting birth rates will become increasingly important for institutional and socio-economic policy, on both the central and local government levels.

In this regard, among the numerous initiatives underway, with the 2017 Budget Law the Ministry for Family Policies supplemented the existing childbirth incentive

policies with the Childbirth Bonus (also known as the Mothers of Tomorrow Bonus) as a maternity support: a financial benefit linked to pregnancy, to be granted to mothers or expectant mothers on a lump-sum basis. As of January 1st, 2017, the € 800 Childbirth Bonus is paid out directly by INPS for the birth or adoption of a minor, at the prospective mother's request upon reaching the seventh month of pregnancy, or else within one year of the occurrence of the event (birth, adoption or pre-adoptive custody).

Engineering collaborated with INPS throughout the entire feasibility study/analysis process and the management of the entire service, from the receipt of the application to the preliminary investigation and the calculation/payment.

The procedure entails the electronic submission of the application to INPS using a series of methods that are implemented and supported using solutions by Engineering:

- On the Internet, via the Institute's Website, which can be directly accessed by the citizen using the appropriate PIN
- Through the Integrated Contact Center, which can be accessed by citizens by calling the toll-free number
- Through patronage organizations.

The submitted application is investigated by the local operator using the functions offered by the Institute's Intranet environment. At the end of the investigation, the case is approved for payment and the outcome investigation is simultaneously rendered available to the citizen on the Institute's Website.

● UNAR ● DIGITAL SOLUTIONS AGAINST ● ONLINE DISCRIMINATION ● AND HATE SPEECH

While Engineering's *Digital Transformation* technologies and solutions are widely used in the business

world, they are also widely used in the non-profit and institutional sector, like in the case of the technological support provided to the National Anti-Racial Discrimination Office (UNAR) for the purpose of monitoring the causes and phenomena associated with all types of discrimination, and for providing concrete assistance to victims.

The UNAR, which is dedicated to promoting equal treatment and eradicating discrimination, is an organization deputized by the Italian Government to guarantee the right of all people to enjoy equal treatment, regardless of ethnic or racial origins, age, religious beliefs, sexual orientation, gender identity, or physical disabilities.

The UNAR is responsible for monitoring the causes and phenomena associated with all types of discrimination, researching possible solutions, promoting a culture of respect for human rights and equal opportunities, and providing concrete assistance to victims. In order to render these activities quick and effective, the UNAR has established a free, multi-lingual Contact Center for victims or witnesses of discrimination, which is dedicated to collecting reports, complaints and testimonies of discriminatory conduct or events, and providing information, guidance and support in order to prevent or combat the same.

The Contact Center offers professionally qualified counseling for those who need to report or counteract discriminatory conduct. Through a careful investigation, the Office helps to resolve the matters in question wherever possible, or else accompanies the discriminated subject through the jurisdictional process.

In support of the work conducted by the Contact Center, Engineering has developed an information system dedicated to the management and registration of the complaints collected, including those received from the various information points (focal points, institutional e-mail accounts, etc.). The Case Management Software Application handles the entire complaint management procedure, from the registration of the forms to

the assignment of the case to the official or expert. The software is designed to always keep the reporting database on-line, thus allowing the authorized operators to perform searches and generate reports on the most relevant problems. The Contact Center is notified of the episodes of discrimination through various channels:

- the toll-free number 800-901-010
- the website (www.unar.it)
- email messages, faxes, or letters addressed to UNAR (both directly and from other institutions)
- reports submitted through social media channels (Facebook, Twitter)
- reports collected personally by the officers or the director
- press release and website monitoring.

The telephone assistance offered by the UNAR's toll-free number is carried out by operators with experience in mediation and conciliation, and is available Monday through Friday from 8:00 a.m. to 5:00 p.m., with a voicemail system active at all other times. Assistance is guaranteed in English, French, Spanish, and Arabic, and, if necessary, in Romanian, Chinese, Portuguese, Polish, Russian, Urdu, and various African languages as well (Lingala, Kikongo, Kingole, Tigrinya, and Amharic). For each report, the following information is recorded in the IT platform: the reporting party's personal information, the dynamics of the episode of discrimination, and any general data or information that might allow for the better management and resolution of the case by the UNAR.

Other materials are then added during the course of the case: documents requested and obtained, the opinions of the parties involved, the various solutions adopted, any other information useful for completing the case information.

Engineering also supported UNAR in the implementation of IT tools aimed at combating the phenomenon of online hate speech.

Thanks to the National Observatory against Discrimi-

nation in the Media and on the Internet, UNAR has expanded its monitoring activities already present in the traditional media, and has posed itself the objective of researching, monitoring and analyzing, on a daily basis, the potentially discriminatory content generated on the main social networks (e.g. Facebook, Twitter, GooglePlus, and Youtube), as well as in newspaper articles, blogs, and fake news websites.

The Observatory adopts an interdisciplinary strategy that combines sentiment analysis, monitoring, and victim protection with the research, development, and design of campaigns and initiatives aimed at raising Internet users' awareness of the fight against online hate, intolerance, and violence.

The research, analysis and monitoring of hate speech content is carried out using an ad hoc software application created by Engineering, which operates on the Web by creating Monitors. Monitors are thematic search fields made up of keywords and filters (the language, the media, and the countries in relation to which the search is to be conducted).

Using the data analyzed on a weekly basis, monthly reports are generated on the cases of discrimination entered into Case Management, and quarterly reports are generated on the cases of discrimination identified from media and Internet monitoring. A quarterly statistical and analytical/interpretative report is then generated in order to evaluate the service performed, with particular regard to the reports of discrimination collected and the relative actions taken.

● SICRAS ● INNOVATIVE SOLUTIONS ● AGAINST TAX EVASION

At the end of 2016, the process of computerizing the Tax System was accelerated when the Tax Authori-

ties established its digital strategy for the three-year period 2017-2019, developed in accordance with the strategic political, administrative and management guidelines defined by the Ministry of Economy and Finance and by the applicable regulations. This strategy, which is to be implemented alongside the Public Administration's recently published three-year ICT Plan, covers the main directives of the digitalization of user services, and the digitalization, streamlining, and enhancement of information assets.

An in-depth territorial knowledge, and advanced decision-making support tools based on this knowledge, can assist policymakers and can help to improve public administration. The ways in which it must be realized and transformed by the integrated digitalization of the processes and services must change over time, not only by adapting to the regulatory changes, but also the changes in society, the changing needs and expectations of the citizens, and by introducing new technologies and paradigms, with a particular focus on user satisfaction and continuous improvement.

SICRAS aims to condense the knowledge obtained from the large amount of information collected by Public Administrations and other public officials and organizations: this information is typically strewn about on various dissimilar and disconnected data sources, and might even be partially obsolete, unreliable and redundant.

SICRAS is the research project for the implementation of the Local Authorities' tax and social policies. The implementation of these policies at the various levels of the Public Administrations requires the consultation of dissimilar information sources, such as the land register, the unified compliance office, and the office of vital statistics, in order to obtain the relevant information for the administrative documents to be produced. The need is increasingly arising to integrate these data sources with information that can be obtained from the analysis of satellite images, which provide an excellent

vantage point of the territory and its changes. Finally, it is becoming increasingly important to ensure the possibility of integrating these data with other public information available from sources like social media, newspapers, press agencies, and blogs, as well as any other data that can be obtained from the Web 2.0.

The aggregation of these dissimilar and inconsistent sources with different semantics, populating principles, and formats, represents a critical problem for which the current technologies (business intelligence, multidimensional analysis, data mining, etc.) only seem capable of providing partial, costly, and not very scalable solutions.

To overcome these critical factors and meet territorial verification and government needs, a new paradigm of gathering, clearing, representing and navigating data is needed, whether structured or destructured, alpha-numerical or geographic.

Semantic technologies can contribute to the development of new generations of software for tax and social policies, in which the semantic identification of the relevant entities (such as natural and legal persons, places, buildings, land parcels, contracts and payments), the explicit representation of the relations between these entities, and the links to the information attributable to them, constitute a conceptual override of the approach used by the data management tools currently present on the market.

The goal of the project is to develop and implement methodologies and tools for the creation of a technological platform that, through the use of semantics and GIS, will provide a unified and integrated overview of the citizen from a social and tax standpoint. This will allow us to obtain an articulated and scalable semantic knowledge base on everything relevant for the tax assessment process within a given territory, one capable of supporting an innovative system of aggregation, recovery, classification, navigation, and evasion detection in relation to local and regional taxes, in support

of the application and monitoring of social and tax policies throughout the country.

By properly engineering these results, the organizations responsible for tax assessment and collection will be able to collect, aggregate, and navigate information more easily, and use it in an organic and centralized manner, with excellent quality and reliability: for example, it will be possible to cross-reference the file data of citizens' who benefit from tax breaks, balance sheet data, and family composition data, in order to track down false declarations and take appropriate actions to combat tax evasion. Finally, thanks to the entity-centric approach, the data source aggregation and recovery times will be significantly improved, thus allowing the system to scale more easily in the presence of large volumes of diversified data sources.

The role and potential of semantics will be studied for the purposes of:

- representing the various aspects that characterize the citizen, in order to create a unified system for taxation and social policies
- developing innovative tools to support tax evasion analysis and recovery policies
- developing innovative tools to support social policies throughout the country
- developing support services for the taxpayer, in terms of both tax position consultation and the management and execution of payments.

● **SISAR** ● HEALTHCARE INNOVATION ● IN SARDINIA

The project, which was launched in 2008 and was realized with the technological contribution of Engineering, is entirely unique from both an organizational and technological standpoint. All of the new system's application components are integrated within a single common IT platform shared among all the subjects

involved in the project, which allows for the management of multiple services and areas:

- regional CUP offices (over 122 million services recorded in the CUP system)
- admissions and outpatient activities (416 departments with a total of over 2 million admissions)
- local health services (148,000 cases for legal medicine alone)
- logistics, accounting, and budgeting (1 million payment orders)
- human resources (over 3 million payslips processed)
- document management (5 million documents registered).

The SISAR project is a mature and consolidated project that has allowed the Region to achieve important results, like:

- facilitating the citizens' access to health services (by improving and simplifying access to health care booking systems), services for selecting and canceling a primary care physician, and other services offered by the Regional Health Service
- granting citizens access to their Electronic Medical Records, and always having their clinical and health history available
- improving primary care efficiency through the integration of freely selectable general practitioners and pediatricians into the network, in order to facilitate continuity of care processes
- supporting the improvement of healthcare service quality and encouraging the development and consolidation of high quality services through the introduction of specific solutions geared towards clinical governance, ongoing medical training, the measurement of results, and telemedicine
- allowing for the improvement of integrated social assistance and social health assistance processes
- providing a uniform system for the administrative management of healthcare facilities
- supporting proactive prevention interventions

throughout the country

- supporting the meticulous control of health expenditures
- loading the new healthcare information system with the data to be forwarded to the relevant ministries (information obligation).

Thanks to the standardization of the processes and technologies, this experience of absolute excellence has provided for an increase in the quality of healthcare for the citizens, and a better ability to plan and manage on the part of the regional health system's administrators.

● ICU MEDICAL RECORD

● THE ICT AT THE SERVICE OF PATIENTS

All over the world, e-Health is considered to be one of the most promising aspects of the future of Healthcare, due to the quality of care, efficiency, and savings that it is able to offer. In addition to the US, e-Health is becoming an increasingly widespread phenomenon throughout Europe as well, with a shining example being provided by Denmark (the true kingdom of e-Health on the Old Continent).

Denmark's example reveals how the Healthcare scenario is undergoing profound changes on an international level thanks to the use of ICT technologies. Driven by the European Commission's 2012-2020 e-Health action plan, e-Health is expected to make huge leaps in the EU.

In the field of Healthcare, ICT should not only serve as a tool for improving operations, but should also, and above all, be considered as a primary factor in the organization of diagnostic, therapeutic and surgical processes, as well as the organizational management of the departments. In this regard, Engineering has developed the ICU (Intensive Care Unit) - Medical Record, a next-generation solution for the clinical support and operational management of intensive care

hospital activities, which take place in Intensive Care units (pediatric, neonatal, cardiological), Stroke Units, Post-Surgery Rooms, Emergency Rooms, and Intensive Monitoring Units. This solution provides doctors and nurses with with an intuitive, comprehensive, and safe support for the diagnosis, planning and execution of therapeutic, monitoring, and educational interventions.

The ICU-Medical Record is a proactive tool that allows the medical staff to obtain an overview of the patient using the Patient Badge, thus allowing for a quick assessment of their status, and the receipt of alerts regarding their conditions. The system allows for efficient navigation among the patient's clinical information, while at the same time providing handy summary tables indicating past and future activities performed, and the subjects involved in the treatments.

Among its numerous potential uses, the system is capable of signaling the onset of specific changes in the patient's biometric parameters and other information collected, while at the same time assisting the specialist with treatment protocols and offering consultation of the intensive area's specific guidelines.

With the aim of providing increasing levels of interactivity and active patient involvement, the ICU-Medical Record tool can even be accessed directly at the bedside using tablets and smartphones, and even guarantees functionality in areas not covered by Wi-Fi with subsequent data updating.

SMART CITIES FOR A BETTER LIFE

26 RESEARCH
and Development projects on Smart
Cities

36 PILOT CITIES
involved in the projects

→ **THE ITALIAN CITIES INVOLVED INCLUDE:**
Trento, Genoa, Lecce, Terni, and Milan

→ **THE EUROPEAN CITIES INVOLVED
INCLUDE:**
Copenhagen (DK), Barcelona (ES),
Manchester (UK), Lisbon (PO), Antwerp (BE

→ **THE NON-EUROPEAN CITIES INVOLVED
INCLUDE:**
Fujisawa (JP), Tsukuba (JP), Osaka (JP),
Kyoto (JP), La Plata (ARG)

Smart Cities are cities that offer modern transport, friendly administrations, and efficient services. A physical space in which the Smart Communities interact, develop, and essentially live their lives.

But in order for a smart city to be just that, it is necessary to develop IT solutions capable of transforming the cities of the future into digital platforms that connect various services and bring together data from different IT systems, thus offering an immediate response and direct and easy access to everything that the citizens need.

Engineering is the only Italian company capable of offering all this, with technological solutions designed to accompany the urban centers that have embarked on the pathway of innovation, and help them resolve the problems associated with traffic

management, pollution, and the general quality of their citizens' lives, through technology. The primary objective is to integrate themes relating to various areas and make interact with one another, in order to offer effective solutions that bring value to the existing infrastructures, thus creating what is known as City Knowledge. Allowing data about different public and private organizations to interact with one another, and bringing them together strategically, while allowing them to remain the property of the organizations themselves, is the best way to offer services that facilitate and improve quality of life within cities.

Data, IoT solutions, security, and open source are the key words of Engineering's business, and are the elements necessary to respond to this phenomenon. In this regard, the company develops new solutions, and improves upon existing ones, each year. In 2017, the City Enabler platform was created for the provision of urban services, and for the governance of the data sources throughout the country derived from non-uniform sources, such as Open and Linked Data, sensors (IoT), and legacy systems (internal IT systems used by organizations for data management).

In order to meet the market's new demands and demonstrate its commitment, Engineering also participates in various research initiatives and programs throughout Italy and Europe, through public and private networks and partnerships, and collaborates with numerous organizations in order to establish strategies for the growth and competitiveness of companies and digital economies in the main emerging ICT sectors.

- **FIWARE:** a European open source technology aimed at creating a sustainable and open ecosystem through the implementation of software applications that allow for the development of new smart applications in multiple sectors. Engineering is even one of the founding members of the FIWARE Foundation (www.fiware.org), for which

it holds a prominent position within the control and governance body. Several new and important partners also joined in 2017, including Japan, with which a fruitful pathway of cooperation has been undertaken.

- **BDVA:** Engineering is in charge of the Smart Cities working group established by the Big Data Value Association (www.bdva.eu), which has more than 160 members throughout Europe, and represents the European Commission's private counterpart for the implementation of the Big Data Value PPP (Private Public Partnership) program.
- **AIOTI:** Engineering is a founding member of the Alliance for Internet of Things Innovation (www.aioti.eu), which is aimed at creating a sustainable ecosystem through IoT technology and the implementation of applications to accelerate sustainable economic development and growth on the global digital market.
- **ECSO:** Engineering promotes and actively supports the European Cyber Security Organization (www.ecs-org.eu), whose goal is to render Europe and the security industry more innovative and competitive thanks to the collaboration and support of the Public Administration, Universities, Research Centers, and businesses.

- **CEDUS (CITY ENABLER FOR DIGITAL URBAN SERVICES)**
- **AN OPEN PLATFORM FOR SMART CITIES**

In just over 10 years time, 58% of the world's population (about 4.6 billion people) will live in medium to large urban areas. According to the Strategic Opportunity Analysis of the Global Smart City Market by Frost & Sullivan, a market for smart urban solutions will develop within these urban areas, which will offer enormous commercial opportunities, with

an estimated value of \$ 1,565 billion by 2020. This estimate was obtained from various indicators, even of an economic/administrative nature.

This market is targeted by the City Enabler urban platform, which is aimed at providing services for the governance of the municipalities' data sources located throughout the territory and derived from non-uniform sources, such as Open Data, Open Linked Data, sensors, and legacy systems. The goal of the project is to create an innovative City Enabler (CE) software application, whose purpose is to discover, manage and organize the data sources scattered throughout the urban ecosystem for the creation and provision of services for the city (urban services) that can be utilized through georeferencing and mapping. The platform is user-centric, supports cities in their decision-making processes, encourages the creation of new business opportunities, and allows citizens to benefit from innovative applications.

How the platform works:

- **City Data collection and metadata quality:** detection of data sources, existing Open Data platforms, web services, devices and microproxies; registration of the collected metadata within the City Enabler, upon which a quality assessment is performed
- **City Data integration:** the various data sources collected can be graphically integrated; for example, it is possible to obtain aggregate information on the number of free parking spaces available, integrated with real-time data from the parking sensors
- **Fast creation of new map based Urban Services:** creation of a new map of urban services in which sector-specific services (mobility, tourism, energy, waste management and others) interact with one another using the data collected from different domains, with the original source of the data remaining unaltered.



▶ THE DOMESTIC AND INTERNATIONAL EXPERIENCE OF THE MUNICIPALITY OF GENOA

by PAOLO CASTIGLIERI

Like in other countries, much work has been done in Italy over the past decades in the field of Smart Cities, but certain nationwide initiatives aimed at organizing them and facilitating the establishment of a structured pathway have only arisen more recently. I'm referring to the ANCI "Smart City Observatory", Italian Smart City, and Urban Agenda initiatives, which aim to facilitate the dissemination of best practices and innovative solutions adopted by Italian cities, some of which can certainly aspire to a leading role, but are not yet thinking in terms of governance. The establishment of an effective model represents the true added value and reward for the creation and development of a Smart City that can truly be defined as such.

Genoa found itself facing challenges that forced it to radically reconsider its role and future prospects. Challenges that were both common to the rest of Italy and Europe, and, in part, specifically local: the end of the economic model based on public heavy industry; the adaptation of the port to modern technologies; the nation's increased exposure to the hydrogeological risk; the particular mobility-related difficulties; the aging of the population and the increasing migratory flows; the need for a new relationship between the Administration and the citizens that takes the digital revolution into account; and, finally, globalization, which essentially defines all of these challenges.

The city Administrations have responded to these challenges on various levels, from the promotion of Genoa as a tourist city, to improving the security of the territory. In particular, Genoa is engaged (and is perhaps even a pioneer) in the fields of Smart City policies, technological innovation, energy and sustainable mobility. This enterprising tendency arose within the city following the establishment of the Smart City Sector in 2012, which subsequently evolved into the Smart City Strategies and Supranational Projects office. In collaboration with other sectors of the Administration, this office

plays a central role in the management of the projects. The Smart City ideal pursued by the city of Genoa is consistent with the classic concept, according to which smart processes are capable of improving quality of life for all citizens through network expansion, technological innovation, and sustainable economic development. Planning the city of the future means reducing the waste of resources, while at the same time improving the services provided to citizens. And, above all, it means being pioneers of new cultural models that will change our development, our economy and, ultimately, our community.

However, regardless of the definition, we believe that it's important to focus upon the context of the individual cities' ecosystems, in order to come up with different solutions, methodologies and tools based on each city's specific characteristics. That is to say that the needs, approaches, and technologies applied by the various cities might be different in terms of mobility, energy, and other similar features.

The process in Genoa, which began in 2010, was immediately focused upon the Smart City governance cycle. In fact, it's no coincidence that the Genoa Smart City Association, which was strongly desired by the Municipality, the University of Genoa and Enel (as founding partners), was established at the same time, and that it now has over 100 members from every category: Institutions, Research Organizations, and Businesses. This Association represents the tool chosen to increase stakeholder engagement and to design the Genovese Smart City model in a hands-on way, with the city system being involved in defining the objectives, innovative projects, and even appropriate technological solutions.

Genoa is even engaged in strategic initiatives on a European and international level, particularly in the United States. The commitment shown with the use of this model in recent years has certainly proven rewarding for the city in terms of performance, especially with regard to the Smart City and innovation-related projects and funding it has received. This has allowed for countless

innovative and successful initiatives to be conducted throughout the territory in a wide range of smart fields, such as:

- **Energy** with the R2Cities, Celsius, Transform, Very-school, and Illuminate projects
- **Urban Resilience** with the Harmonise and Floodserv projects
- **Mobility** with the Electra, Muveus, Elviten, and Mobymart projects.

The development of these projects will rank Genoa among Italy's top cities in terms of the acquisition of EU funding. The international initiatives that Genoa has joined have the following strategic objectives:

- to promote and facilitate the pathways for local businesses to access the international markets, also through the "Genova Smart City" brand
- to participate in projects aimed at developing innovative standards and platforms, together with its technological partners
- to improve the city's positioning and reputation on a global scale
- to attract funding and "innovative minds" to its area.

As part of this strategy, Genoa is a member of several European and international networks considered to be strategic for the city (including: Eurocities, Green Digital Charter, Connected Smart Cities Network, Global Smart City & Community Coalition, and more). The city has also joined several U.S. and European initiatives with its own solutions developed within the context of major European projects or technological partnerships.

Two of these initiatives are considered particularly important:

the GCTC program - the Global City Teams Challenge organized by the NIST (the American National Institute of Standards and Technologies), for which Genoa submitted several Action Clusters linked to the development of IoT platforms in the various areas of interest (Urban Resilience, Energy and Urban Platforms)

The IUC program - the International Urban Coopera-

tion program organized by the European Commission, which is aimed at developing partnerships among European and non-European cities in various Smart City-related fields. Thanks to an international collaboration project, the city of Genoa has received funding in the field of Smart City governance, together with the city of Rosario in Argentina.

The model is based on public/private partnerships for the implementation of actions or the dissemination of best practices.

For Italian cities, the added value and the advantages of participating in international Smart City projects are considerable. In addition to those already mentioned, there's the strategic importance of collaborating with partners on the establishment and implementation of new technological and process standards, and new high-tech platforms that can serve as benchmarks for the development of new solutions in the future. This results in a competitive advantage for both the city system, in which it is possible to implement highly innovative technological demonstrators, as well as for businesses, which are able to expand into the areas of open innovation and technology transfer.

In the coming years, we'll continue to work on the development of vertical technological solutions that will engage various sectors, focusing our efforts upon solutions linked to Big Data, Analytics, and the Internet of Things (the need for cities to be able to think in terms of Urban platforms in order to support both their decision-making processes and the management of their infrastructures).

We will also continue to play a key role in defining international standards and global best practices, breaking down the vertical structures of our traditional thought processes, and establishing innovative sustainability models through public/private partnerships.

Paolo Castiglieri

Manager of the Municipality of Genoa's Smart City Strategies & Supranational Projects office

City Enabler uses a series of technologies, which work together in order to allow it to function. Within the system there's a City Data Workspace, or rather a single point of access to all the city's data, which are received in real time from various sources. Using IoT tools, sensors are activated in order to monitor the services utilized. Two other tools are the City Data Mashup Editor, which allows for integration among the various data, and the City Front-End, which allows for the use of the integrated data through an innovative map of the urban services. The City Enabler platform's areas of application are vertical, and include services relating to parking, tourism, transport, environmental performance monitoring, street lighting, and so on.

According to the target stakeholders, the City Enabler platform offers a wide range of benefits:

- for city administrators, it's useful for making decisions and implementing action plans and management policies, thus saving time and money
- for those involved in urban planning, it's useful for raising awareness of the benefits that can be obtained from the data at their disposal, thus saving time and money
- for those who store and manage the cities' data, it's useful for easily sharing information and obtaining benefits from data published by others, thus saving time and money in this case as well
- for citizens, it allows for the use of innovative apps that allow them to improve their quality of life in the city.

The City Enabler platform was tested in the Province of Trento (Italy), in the Municipality of Malaga (Spain), and in the Municipality of Rennes (France). Furthermore, it has already been chosen by the Municipalities of Genoa and Ancona (Italy), and was selected during the European Pre-Commercial Procurement process as one of the solutions for developing multi-domain urban platforms in the cities of Antwerp

(Belgium), Copenhagen (Denmark), and Helsinki (Finland). Having launched the Pre-Commercial Procurement process, and having defined the functional and non-functional requirements that the platform must meet, as well as the relative application domains, these last three cities are jointly known as the Buyers Group. As such, these three cities have positioned themselves to become the first buyers of these winning solutions.

CITY ENABLER IN MALAGA

One case of the City Enabler platform's actual application is that of Malaga, where it was used for parking. There were two main data sources utilized: the Open Data portal managed by the city, and the real time data (obtained through sensors) managed by a private company. The data from these two sources were stored in the City Data Workspace, and were processed and mapped by the Data Mashup Editor, thus creating a platform that allows all the citizens to view parking availability in real time.

● **SELECT for Cities** ● DIGITAL SERVICES FOR URBAN MO- ● BILITY

A city couldn't really be considered "smart" if it only included cycling paths, smart grids, or ecological islands.

A Smart City is a place where urban networks (both human and technological) are integrated with one another in order to optimize convenience, efficiency and quality of life for all those who live and work there.

These cities aim to achieve self-sustainability by minimizing their environmental impact: here, the latest innovations guarantee an intelligent exchange of energy and resources, and connectivity – through information and communication technologies (ICT) and the Internet of Things (IoT) – allows citizens to take control of urban centers, thus improving their daily lives based on their own decisions.

Engineering intends to help respond to such a strong demand for change through SELECT for Cities Pre-Commercial-Procurement (PCP). Funded by the European Commission, the project stems from the demand for new methods, technologies and tools for promoting open innovation, with the aim of creating value for citizens and businesses.

SELECT for Cities faces the challenge of designing and implementing a platform for European cities geared towards services and standards.

It's data-driven and user-centric, thus allowing for the large-scale co-creation, testing, and validation of urban IoE (Internet of Everything) applications and services. In particular, the three cities involved in the project (Antwerp, Helsinki and Copenhagen) have the opportunity to test and purchase pre-existing innovative solutions not yet available on the market.

Along with ATC and EIT Digital, Engineering has been selected to perform Phase 1 (Concept Design) and Phase 2 (Prototyping), which is currently underway, in order to propose a more advanced version of the City Enabler solution as an Internet of Everything (IoE) platform made up of various tools:

- 1) City Data Workspace**, a tool designed to organize uniform data sources and provide a single layer of access to the information
- 2) City Data Mashup Editor**, a tool that allows for any data structure in FIWARE Data models to be

graphically mapped

- 3) Dashboards Manager**, a tool designed to help the user create custom dashboards for displaying the collected data in different ways
- 4) Datasource Discovery Engine**, an innovative tool that allows the user to automatically search for potential data sources on the Web
- 5) City Front-end**, a catalog, categorized by domains, that allows the user make use of the dashboards created using the dashboards manager
- 6) Citizen Data Vault**, a tool that centralizes the management of personal data in compliance with the latest EU privacy regulations (GDPR).

- **BIGCLOUT**
- **STRENGTHENING THE ROLE**
- **OF CITIZENS IN SMART CITIES**

There are currently 8.4 billion things connected worldwide, 31% more than in 2016, and this number will likely exceed 20 billion by 2020. The Internet of Things, ranging from cars to traffic lights and televisions, continues to expand at an extremely fast rate. According to Gartner estimates, this year the Internet of Things (IoT) market will simultaneously contribute to and benefit from the evolution of network technology, changes in consumer preferences, and legislative adaptations. All this has a positive direct and indirect impact upon the economy, which currently amounts to nearly \$ 2 trillion dollars worldwide this year alone, with the prospect of exceeding \$ 3 trillion as early as 2020. Having been driven up until now by the consumer segment, this revolution made up of smart TVs, set top boxes, WiFi security cameras, and smart thermostats, boasts a base of over 5.2 billion devices installed worldwide, amounting to 63% of the entire Internet of Things.

The BigClouT European research project, in which Engineering participates, arose with the aim of providing cities with an analytical mind, by creating a distributed intelligence that could be applied to the entire urban network. The extraordinary number of connected things and the enormous amount of data available pose new technological challenges in terms of interoperability, scalable and real-time data processing, extraction of usable knowledge, self-management, security, and privacy. In order to meet these challenges, the BigClouT project relies upon the resources and know-how of prestigious European and Japanese institutes, and will capitalize on the results achieved with the ClouT project by increasing the capacity for distributed intelligence thanks to edge computing, data analysis and self-awareness solutions.

The BigClouT platform will be released and validated at 4 pilot centers: Grenoble (France), Bristol (UK), Tsukuba and Fujisawa (Japan). Throughout the entire life of the project, special emphasis will be placed upon citizen involvement, from the definition of the use cases to the time of validation. The BigClouT project also sets itself the ambitious goal of creating a community of external end users, who will be given the chance to create their own applications/activities within the context of the tools and the platform, both during and after the project's completion, in order to ensure the sustainability of the of ClouT and BigClouT results.

Within the scope of the BigClouT project, Engineering plays two main roles linked to its technical expertise and its commercial experience: it's responsible for a series of technical activities, namely the architecture design and the implementation of the distributed storage, and provides business intelligence and Big Data analysis tools through the open source Knowage platform. After the project's

conclusion, Engineering will also be responsible for defining the business model, focusing upon the BigClouT platform's sustainability.

● REAL TIME ● TRANSIT PROVIDER ● GETTING AROUND IN SÃO PAULO, ● BRAZIL

The issue of urban mobility has become increasingly important in recent years because it's directly linked to the citizens' quality of life and the quality of the city's air.

In the city of São Paulo, Brazil, which has 15 million inhabitants, collective transport is the fastest and most sustainable way to travel. In fact, two thirds of the city's inhabitants make use public transport, and every day millions of paulistanos take nearly 15,000 public buses on over 1,300 transport lines, which, in 2016 alone, transported approximately 3 billion passengers.

However, the city's transport system has shown increasingly evident quality gaps, which have generated criticism from both the media and citizens due to a lack of accurate information regarding transit routes and departure times. In order to resolve this situation, in 2017 Engineering implemented the Real Time Transit Provider system for the metropolitan region of São Paulo, which was launched in March of 2018.

The system was arose from a survey, which showed that 10% of those who use the bus transport system are forced to request information from other users regarding transit lines and schedules, and that 5% to 8% of the population, which currently doesn't use public transit, would use bus transport system if it

had access to more accurate and certain information. Since 99% of people who own a smartphone have installed the Transit app on their mobile device, and 60% of those looking for information on public transport use the Internet as a resource to obtain this information, Engineering's strategy was to exploit the vast numbers of mobile and web-related technologies found throughout the urban area. In fact, using the interconnection guaranteed by the smartphones and the fast networks, Engineering has created a system capable of providing the citizens with real-time public transport information using interactive maps and the geolocation systems found on the mobile devices themselves.

By establishing a partnership with a leading operator offering online products and services, Engineering has created a computer platform called INFOBUS, which is capable of providing the technical partner with all the necessary data relating to public transport, so that citizens connected to the Internet can obtain real-time information, on their own smartphone maps, regarding bus arrival times, the specific locations of the stops, and the actual updated routes of all the city's transit lines.

● CAR NET ● VOLKSWAGEN'S ● INTERNET-CONNECTED CARS

In the automotive industry, on board technology has come to play an increasingly strategic role in recent years. Just think of GPS navigations systems, parking sensors, driver and brake assist systems, smart keys, voice commands, head up displays, and all the functions that can be performed using a smartphone. The word infotainment is a neologism derived from the words information and entertainment, and is used to indicate a series of multimedia features installed on a car.

Infotainment systems represent one segment of the automotive industry that has undergone major changes in recent years. All the automakers have committed themselves to offering innovative entertainment systems, allowing a permanent Internet connection directly on the car's screen, and providing an advanced navigation system capable of monitoring traffic in real time.

Engineering has partnered with Volkswagen to create both the customer portal and the functional backend integration for Car-Net, an online service package that allows the driver to interact with the car's infotainment system, which is connected to the Internet via a Wireless Local Area Network (WLAN) connection and through MirrorLink™, Apple CarPlay™ and Google Android Auto™ technologies.

There are numerous services available in real time.

- **Search destinations:** this service helps improve the destination searching function via an online Google request. The service provides detailed information on the destination, such as distance and address, with the possibility of selecting a phone number from among the contacts, or starting navigation to the destination.
- **Traffic information:** this constantly updated information function offers the driver an excellent overview, and allows them to alter their route dynamically.
- **Import destinations:** through the Car Net customer portal, users can select custom destinations and send them to their navigation systems.
- **Weather:** this service provides information on the current local weather conditions or those of the destination, with detailed weather reports and multi-day forecasts.
- **News:** the navigation system displays the news items from among the categories selected on the portal.
- **Vehicle status report:** via the portal, the user can

retrieve data regarding the vehicle's use (upcoming maintenance, warnings displayed on the dashboard, etc.).

- **Gas stations:** in addition to the destination coordinates for navigation, other information is also available, such as up-to-date fuel prices at nearby gas stations.
- **Parking lots:** this service displays all the parking lots, from public to multi-level, indicating the total number of spaces, as well as the number of free spaces available.

There are approximately 60 people at Engineering who work closely with the customer in Wolfsburg, Barcelona, and Prague to manage Volkswagen's Car Net, Skoda Connect and Seat Connect systems. The solutions developed can be considered "state of the art technologies", as they fully integrate cloud solutions and guarantee maximum update speeds: mandatory features in an ultra-competitive sector characterized by rapid obsolescence.

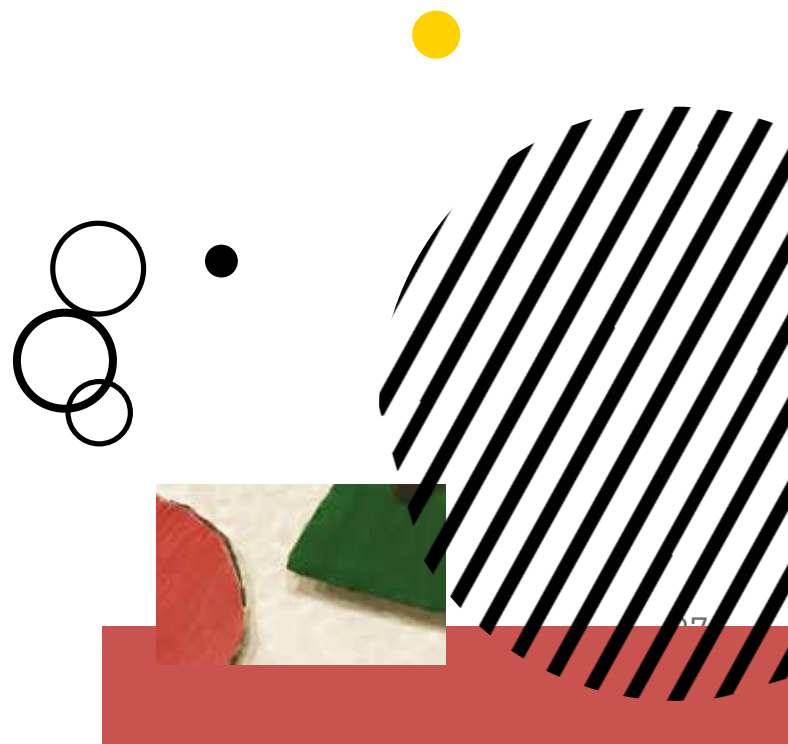
Engineering is also at the forefront in the search for what will be the next generation services, with the following expected to be available by 2020:

- Parking Service, Cloud Based User, and Car Profile within the context of Predictive Maintenance
- Virtual Car Keys and Inter-modal Navigation Services, with regard to the range of Location Based Offers
- Big Data Based Services and Subscription Based Services, with regard to the Profile Based Offers.

The aim of the project is to assist Volkswagen Group in its transformation from a car manufacturer to a mobility service provider. In this regard, there are three challenges to be faced in the future:

- **The omni-channel experience:** the car will become part of an overall experience linked to a series of services, of which mobility will only be one part.

- **Personal Assistant & AI:** the car must offer the possibility of having more comprehensive and effective communications with the user, through the use of smart systems.
- **Mobility as a Service:** the concept of personal car use, which is associated with ownership, will be increasingly accompanied and replaced by car sharing.



THE DIGITAL TRANSFORMATION OF BUSINESSES

over
500

CUSTOMERS

in the industry, food, fashion, transport, aerospace, automotive, pharmaceutical, and service sectors

175

CUSTOMERS

in the gas, energy and water sectors

25

CUSTOMERS

and 50 technology partners in the telecommunications and media sectors

over
400

CUSTOMERS

in the financial and insurance sectors

over
500,000

LOANS

managed through our systems

over
2,000

INFORMATION BASES

sent to the Bank of Italy on a monthly basis

2
million

LIFE AND DAMAGE POLICIES

issued through our systems

Engineering makes an important contribution to the digitalization of Italian companies. This is also due to the range of markets covered by the products and services offered, which are used by some of the most important companies in the industrial, energy, telecommunications, media, utilities, finance, and insurance sectors, which the Group supports in the continuous development of their technologies,

processes, and business models.

With respect to a digital transformation that's affecting every business activity, and which constitutes the true revolution of the third millennium, Industry 4.0 is just the tip of the iceberg. It has begun to have an effect in Italy as well, changing our ways of life and creating value for companies and customers alike. The Digital Transformation is everywhere, and it affects the ways in which services and process and production automation systems are delivered, and therefore the working methods as well.

The future forecasts production models characterized by a greater interconnection within the companies' value chains, for which the challenge consists of being able to change the current paradigms in order to anticipate future scenarios, by managing the dissemination of digital systems. Combined with the digitalization of the current economy, the constant availability of faster connection systems for Internet access is destined to give a new boost to the current process, even by acting as an enabler for technological solutions like Big Data analysis, the use of the Cloud and the Internet of Things (IoT), Robotic Process Automation, Artificial Intelligence and Blockchain technology, the application of which will allow companies to achieve greater efficiency, quality, productivity, and security.

Engineering is a specialized partner that's capable of assisting its customers in transforming their business models by providing them with the appropriate tools to face the changes and new challenges of the market, all while improving their productivity and competitiveness, thus transforming the Digital Disruption into a competitive advantage. To this end, the Group has initiated a major internal transformation, which is aimed at making the transition from Information Technology to the Digital Transformation. Through this organizational restructur-

ing, Engineering aims to serve its customers not only act as an IT support provider, but also as an Information Technology consultant capable of offering opportunities to obtain full compliance with the European legislation (which is now imposing IT requirements, especially in the financial sector) and increased productivity, to the point of changing the companies' business models. In this regard, one important part of the Group's strategic reorganization is the recent establishment of the company En-

gineering D.HUB, which supports the Engineering departments that cater to business customers with innovative, next generation, "as a service" Cloud Computing solutions. Therefore, in addition to offering the market an infrastructure, Engineering now also offers a platform upon which it is possible to install solutions and services created internally, externally, or even directly by the customer. In the finance sector, Engineering is heavily involved in banking/lean/insurance projects.

THE PARTNERSHIP WITH COMAU

This new approach includes the collaboration agreement with Comau, a leading company in automotive sector automation. The goal of the partnership is to offer the market a unique ability, combining the partners' respective skills and experiences, in order to improve the quality and efficiency of the automated production processes using the most modern data collection and analysis technologies.

The partnership's first results consisted of the development of the DiVE (Digital Virtualization Experience) platform, a technological predictive maintenance solution that combines Engineering's internal *Open Source* and *Big Data* expertise in the field of Information and Communication Technology with Comau's know-how in the field of Industrial Automation production lines and robotics.

The DiVE solution is just one example of the possibilities currently available thanks to the combination of robotics, with Cloud Computing and Machine Learning. The developed system is aimed at designing a series of modular and flexible products inspired by the latest technological solutions, which customers can use to maximize the efficiency, pro-

ductivity and quality of their plants.

The joint development of an application framework, based on best-in-class technology platforms, for the collection and analysis of data in the field, offers the customer the possibility of predicting and anticipating potential machine and instrument malfunctions, and their negative effects upon the quality of the production processes.

In order to complete the offering, Engineering has enriched the suite with new engineered assets, which not only allow the customer to optimize its maintenance activities, but also to better complement the production management processes with functions like field interaction (sending commands to the production lines), energy consumption monitoring, and the analysis of quality-related process data.

Various PoCs (Proofs of Concept) and complete projects have been carried out and installed for customers operating in both the automotive sector, as well as the textile, food & beverage and home appliance industries.

The goal is to optimize and transform the most burdensome business processes, with lower added value, through an approach aimed at minimizing the processing times, while at the same time ensuring the tracking of the operations and decision-making processes, the enrichment of the data, the secure management of the documentation, and the automation of the authorization workflows with Robotic Process Automation architectures, which allow the process management procedures to be integrated with advanced Machine Learning solutions. Engineering offers proprietary Big Data management and usage solutions capable of guaranteeing both high processing performance for structured and non-structured data, as well as the governance of the data transformation processes. In this sense, the company envisages the adoption of a centralized data dictionary, metadescribed processing logics, self-produced documentation, a data quality system, and data and metadata lineage tools.

• eR4A • AN ALGORITHM AS A FINANCIAL • ADVISOR

Virtual and automated consultancy, better known as “Robo Advisory”, is a trend that has come from afar. It has been an enormous success in the United States (and has begun to spread throughout Europe and Italy in recent years), where the value of the sums managed by Robo Advisors currently amounts to \$ 0.3 trillion, and is expected to reach \$ 2.2 trillion by 2020.

Robo Advisory services supplement and transform the classic savings model by automatically creating customized investment portfolios based on the customer’s profile in terms of risk, return, financial knowledge, personal needs, and investment objectives. Following the creation of the ideal portfolio,

the Robo Advisor automatically suggests investing in various assets, thus offering the user the possibility of controlling their investments in a transparent manner.

In keeping with the technology trends, Engineering has developed its proprietary eR4A Robo Advising solution, which features an engine capable of profiling customers in terms of finances, assets, and insurance, and interpreting their needs in consideration of their ability to save and their propensity for risk.

eR4A allows for the identification of a range of financial, insurance, and credit products capable of ensuring the achievement of the customer’s objectives in accordance with the principle of economic sustainability (investments with a proper balance of benefits and required commitment, insurance coverage capable of mitigating risks of loss of capital or profitability, and credit support), while at the same time taking the uncertainty of the investments into consideration.

Having already been implemented at a leading Italian credit institution, the system analyzes the customer’s needs, and the financial and insurance resources necessary to meet them, by carrying out massive simulations and proposing various scenarios that maximize the probability of success. The engine uses statistics from the Bank of Italy’s study of Italian families, and is capable of integrating them with the customer information already contained in the Banks’ and the Insurance Companies’ information systems.

The project’s main objective is to analyze, profile and monitor the customers, in order to provide promoters and consultants with a constant and automated support that, on one hand, allows them to propose targeted and sustainable banking and insurance products suitable for the customers’ risk profiles, and, on the other hand, allows the Institute to guide and coordinate the sales activities.

The eR4A solution, which was developed using the

new microservices Service-Oriented Architecture (SOA), allows financial advisors, promoters and insurance agents/brokers to:

- engage in advanced consulting activities, and propose a wide range of relevant, targeted, and sustainable solutions, elaborated using complex mathematical models, that take into account the customer's profile and needs, as well as the uncertainty of the financial/insurance context in question
- have access to an intuitive solution that allows extremely complex simulations to be carried out through simple and immediate interactions
- improve their offering with targeted financial and insurance products
- get to know their customers better and enhance their relationships.

• **BIG DATA** • **IN THE FINANCIAL SECTOR**

Technological innovation is radically changing the financial sector, both in terms of how users interact with their banks and the world of financial services, as well as in terms of the services that banks are developing and offering to their customers. We are in the midst of a revolution that's being carried out via data, and that can be monitored, understood, and directed by working on the data themselves. This is the Data Driven Economy of the banks and financial markets, where every day, for example, 60-70% of stock exchanges are generated by algorithms. In response to these challenges posed by the market, and in collaboration with a leading Italian bank, Engineering is engaged in the development of a Big Data for Finance program aimed at creating a new data architecture with a single point of truth function, which entails the storage of each datum in a unique position to be drawn upon in order to supply

all the application chains, with the consequent improvement of the effectiveness and efficiency of the relative processes, and benefits in terms of timeliness of data distribution and usability.

The realization process is aimed at streamlining the applications and their development. Additional implementations are also envisaged in order to meet the requirements defined within the context of other projects.

The advantages that the program provides to the customer include the following:

- availability of specialized analysis, calculation (e.g. Credit Lines and Guarantees Department), and product quality control engines in the semantic layer that renders them usable for all the other application chains
- architectural development of the Governance, Risk and Compliance application area
- end-to-end Data Governance for integrated data management.

The completed solution offers numerous innovative elements. Among the most important are the ability to manage large volumes of both structured and unstructured data, with high performance and a significant reduction in processing times, and the guarantee of a data quality monitoring system, which allows all of a given product's processing phases to be retraced in order to determine those responsible for any defects.

• **CHE BANCA** • **NEW PRODUCTIVITY** • **WITH ROBOTIC PROCESS AUTOMATION**

Software and robotics are being increasingly used by companies. Robotic Process Automation (RPA) technologies allow companies to automate operations

and processes, especially simpler and more repetitive ones, by using robots to replicate the human operators' interactions with one or more software systems. These solutions offer numerous advantages: they don't require any modifications to be made to the applications, they can automate the users' activities either partially or entirely, they don't require much time to be implemented, nor any specific expertise with regard to the technologies underlying the applications, they increase the execution speed of the work activities, and they render the results of the processing consistent by eliminating the risk of human error and relieving the operator of repetitive activities.

Engineering has supported Che Banca (Mediobanca Group) in its process of introducing a tool for automating certain processes linked to routine and complex activities with a high risk of error and consequent reworking, which in turn can result in wasted time and decreased service quality.

One example of this is the automation of the transfer of securities, which consisted of numerous manual steps. In fact, in order to transfer a securities dossier from one bank to another, the operator previously had to use various applications, carrying out multiple repetitive data entry tasks. Thanks to the automation, the duration of the process has been reduced from 6 minutes to 13 seconds, and manual errors have practically been eliminated, thus ensuring greater productivity and quality of customer service. The RPA has proven particularly useful when applied to time-consuming and low-value-added activities, which can now be managed by the robots in an optimal manner, and within the span of a 24-hour day without interruptions. Unlike an operator, a robot never has interruptions, doesn't get tired and make mistakes, doesn't need to be substituted, and, once it has finished a task, it can be immediately reassigned to another task in order to optimize productivity as much as possible.

After having analyzed the results obtained from the automation systems provided by Engineering, Che Banca intends to implement additional RPA extensions for other particularly complex processes (such as the management of inheritances and mortgages). The choice of Engineering as a partner is particularly noteworthy in view of Che Banca's vision, which is characterized by a strong technological component dedicated to digital innovation.

- **OpenReq**
- DATA ANALYSIS
- FOR LISTENING TO CUSTOMERS

The telecommunications market is always growing more competitive. The advent of social media and the ubiquity of connected devices have changed the way operators interact and engage with customers. According to the data collected by We Are Social, in 2016 over 37 million Italians were active on the Internet, with a penetration of 63%. In particular, 28 million are social media users, which corresponds to 47% of the population, and the average time spent daily amounts to approximately 2 hours.

In a continuous effort to attract and maintain an ever-increasing number of socially connected and highly-informed customers, industry operators are increasingly focusing upon offering innovative, easy-to-use, and responsive products and services, with a focus not only upon customer management and maintenance, but also a high level of customer engagement, in order to exploit their creativity and provide a significant contribution to the development and innovation of the product or service.

In this sense, Engineering has partnered with a European consortium of private companies and universities within the context of the OpenReq project,



▶ ARTIFICIAL INTELLIGENCE: PARADIGM SHIFTS FOR BUSINESSES AND COMMUNITIES

by MATTEO TEMPORIN

Artificial Intelligence (AI) has been at the forefront of the most recent waves of digital technological transformations, and has become an integral part of the IT sector, above all due to its characteristic function of automatic program creation (i.e. programs that automatically create programs, or rather information and digital representations of the procedure to be utilized).

This is known as Machine Learning, whereby computers are able to learn how to perform activities on their own, sometimes even much better than human beings, as evidenced by the superiority of certain programs in games like chess or in stock market forecasts. However, just as reality can never be fully represented with any machine, these capabilities aren't always perfect. Whatever the case, for now, the purpose of machinery is always defined by human beings. The current machines allow the parameters of an automatic learning process to be changed by making the learning process proceed by trial and error until it achieves the intended purpose on its own. These are referred to as Deep Learning techniques.

Nowadays, Artificial Intelligence is applied in various fields (consumer, corporate, scientific and governmental) thanks to the recent exponential increase in computer processing capabilities, the amount of memory available, and the speeds at which information can be transmitted and jointly processed by multiple computers.

There are countless fields of application for consumer services, with machines now serving as personal fitness assistants, medical or legal consultants, and even automatic drivers, to name just a few examples. In the scientific sector, the applications regard the processes of supplementing and disseminating global knowledge, which, by virtue of its structure, is largely "open" and provides the community with an enormous amount of data and results. While the most interest-

ing solutions have been developed in the medical field, major developments are also expected in the analysis of complex systems, like climate and ecology.

The most important applications in the field of government are those in the intelligence sector (e.g. tax surveys), and the military sector, with increasingly advanced and autonomous weapons systems.

For today's businesses, AI represents an opportunity to increase profitability and productivity by developing new services, rendering old ones more efficient, and studying customer behavioral data on search engines, social networks and e-commerce platforms, in order to predict the best sales and service strategies, even in synergy with other IT solutions, including Big Data Analytics and Cloud Computing.

In terms of business processes, Artificial Intelligence can be applied in almost every field: from staff management to communication, logistics, and energy savings. The approach is what matters the most: since products and services evolve extremely rapidly, we must be prepared for the continuous evolution of AI tools, and for the rapid obsolescence of the choices being made now.

In fact, while the advantages of the new applications can generally be quite significant at each stage of their evolution, the competition could also benefit from them and rapidly gain market leadership. Consider, for example, the smart customer support services used by banks and insurance companies, and the possibility that these services might be provided by major Internet players.

The application of AI in the areas described also has indirect social repercussions: just think of how the automation of certain business processes has already reduced or definitively eliminated various job opportunities (whatever happened to the secretaries of just twenty years ago?)

To remember the roles that they played, just watch a few episodes of *Mad Men*, which is set over 50 years in the past! The rapid change in terms of tasks and skills

has already been taking place for decades. An entire series of services, including individual and collective communications, have been completely automated. But these automations have also created new jobs (five years ago, who ever would have thought that a company would need to have a social media manager?). The problem isn't automation, or the increase in smart services, but rather the lag in people's ability to adapt to new roles and tasks. The market itself will generate new job opportunities wherever the individual's capability for self-renewal is unable. This will lead to greater uncertainty and greater mobility: a new collective ability to acknowledge the process and make it sustainable must arise. The resources to do this are there... all we have to do is find them.

Human beings have the ability to worry about their future, and one might say that, in the future, our time will be increasingly occupied by being pre-occupied. Planning for tomorrow must increasingly become a paid occupation. In this sense, certain signals can already be seen today, such as the increased role played by strategic and application consulting. From climate change, to the impact of new technologies on our brains, there's certainly no lack of issues that need to be addressed. I have no doubt that man's ability to seek out original pathways, where problems are faced with increasingly effective and shared representations in which shared solutions can be found, will once again prevail.

I would like to give an example of how the complex interaction between technological development and reality can be tackled by creating jobs: recent surveys conducted by neuroscience experts have shown that adolescents (among others) spend their nights connected to their social networks. This can cause sleep disorders, which in turn can lead to attention and learning difficulties. Parents often aren't even aware of this maladaptive behavior on the part of their children

in the relationship between the brain and technology. But one might also note the increase in accidents on public transport caused by the use of mobile phones. Research on these phenomena (as well as employment) should be dramatically increased, and I don't think that it would be difficult to come up with smart (and even profitable) applications for handling them. We need a cultural evolution that's consistent with technological evolution, creating employment from its risks and potential. At the company, these changes will increasingly result in people being occupied with pre-occupation: forecasting new markets and competitors' moves, analyzing all types of risks, and data security, all in accordance with the compliance laws (regulations and legislation that are often a collective representation of the risks to be avoided and the pre-occupation necessary to avoid them). In order to carry out these new roles, it is necessary to have a mind open to the future, and to imagine how the complex interaction between the company's numerous stakeholders will be able to take place.

Paradoxically, vocational training plays an essential role in this process. In fact, while it is not capable of preparing people for specific roles when the tasks are continuously evolving, it is nevertheless useful at helping the mind get used to pre-occupying itself with examples, or rather specific case studies that are only useful for training purposes, and not as instructions for creating a man/machine to be incorporated within a predefined mechanism. As examples of man's past pre-occupations, lots of math, statistics, history, and philosophy are just as indispensable as learning a programming language, which, to put it bluntly, will be replaced by other more advanced languages within just a few months time.

Young students (or one's own employees) should basically be told bluntly that they will never be paid to become "happy machines", performing jobs that always

remain the same for the rest of their lives: machines are paid a lot less to do so.

With regard to the strategies for promoting Artificial Intelligence, that which has been lacking in Italy over the past few decades is investments in the sector, with a certain degree of industrial and political foresight. And this is despite the fact that, even in Italy, thousands of researchers in various application areas, ranging from automatic image recognition to robotics, are currently interested in AI. These researchers often end up pursuing their objectives abroad, at industrial companies and Universities all around the world. It seems that intelligence goes where it's appreciated, even artificial intelligence.

Artificial Intelligence is currently one of the sectors that's receiving the greatest amount of investment worldwide. In fact, we're basically waiting for the results of these investments to come in, and there are very few Italians sitting at the table of the big players who will be splitting the profits. Lots of people might think that this is just another speculative bubble. Or maybe they think that, whatever the case, we have the most beautiful country in the world, and the Artificial Intelligences will certainly come to visit, leaving us some bitcoins as a tip...

All jokes aside, this evolution may not have the time frames and the impact that many have expected, but it's nevertheless worth investing in order to gain a better understand of the world of the future.

Matteo Temporin

Lecturer of courses on Computer Science and Knowledge Management Systems and Methods at the Brescia campus of Milan's Università Cattolica del Sacro Cuore.

One of the founders of Mind over Money, a center of excellence dedicated to designing models and algorithms, applying them in computing engines, and integrating them within modern banking and insurance systems.

which is focused upon implementing a platform for the management of the Requirements Engineering (RE) process. Engineering plays a particularly significant role in the context of the Intelligence Requirement, or rather in defining the decision support algorithms, and in rendering it applicable to the telecommunications sector.

The goal of OpenReq is to develop, evaluate, and transfer highly innovative methods, algorithms, and tools on the requirements engineering process starting with information collected from the communities of users. In this context, advanced analysis algorithms, such as Recommendation Systems and Machine Learning, can be applied to data sources that fall entirely within the scope of Big Data.

The aim is to promote the broad engagement of all the stakeholders in the various requirements engineering phases, in order to ensure quality and efficiency in decision-making management, which includes the determination of the priorities and the classification of the requirements, along with the verification of quality and consistency with other requirements.

For this purpose, two distinct types of user feedback are collected: explicit and implicit. Explicit feedback refers to information available on the Web (e.g. comments on social media or App reviews). This category also includes the users' subjective opinions, which can be useful for conducting Sentiment Analysis on relevant topics. The implicit feedback is contextual data, collected from devices like smartphones via sensors. These data help us gain a more in-depth understanding of the user's behavior and situation. In close collaboration with telecommunications operators, Engineering is responsible for contextualizing the sector solution through the collection and aggregation of relevant and anonymized data, and the application and evaluation of the algorithms on

the data obtained from the social networks. The final objective is to improve the requirements management process by doing the following:

- providing an ontology that describes the basic concepts, like a glossary of terms in the telecommunications field, in order to allow the system to determine whether or not the data from the social networks are relevant
- classifying the data collected from the social networks, distinguishing between feature requests (i.e. requirements in every respect), bug reports, and general information (e.g. information requests insufficiently conveyed via the contact center).

The use of this approach and its innovative methods allows operators to achieve greater user engagement, and to automatically identify and extract the requirements from social media content.

• **Geocall** • A PROPRIETARY SOLUTION • FOR INNOVATIVE FIELD SERVICE • MANAGEMENT

Up until now, Augmented Reality systems have mainly been used in the medical field, for recreational purposes, and for marketing activities. The development of new application solutions now allows it to be used for companies' core activities, improving service levels while significantly reducing intervention timing and costs. The use of this type of technology is destined to change the way we work, especially in the world of maintenance and support services. Thanks to the use of these systems, the most expert personnel will always be on hand at machines and plants, wherever they are installed, with the possibility of viewing and better managing the risks linked to safety at the workplace.

In this regard, Engineering offers innovative solutions

designed to augment the perception of the operating environment and reduce the complexity of the activities being carried out. Thanks to the integration of the latest mobile visualization and 3D graphics and georeferencing (GIS) technologies, Engineering's solutions provide specific, effective support for technicians and maintenance experts when carrying out their tasks, adding information (generated artificially) to the reality observed via the device at their disposal. OverIT is the Engineering Group company specializing in the design and implementation of innovative Field Service applications that make use of Augmented Reality technology to improve the management of the activities performed throughout the territory, including maintenance and technical support for plants and infrastructures, sales, and customer support and relations.

In this regard, Autostrade per l'Italia has introduced three solutions designed to make use of the surveying functions of OverIT's proprietary "Geocall" software, which provide the mobile technicians with data collection forms to be completed in the field, in order to:

- manage the anomaly inspection activities and monitor the quality of the entire freeway network using specific forms to be completed in the field during the course of the inspections themselves
- improve the operational inspection processes of the corporate buildings and assets, thus allowing for any anomalies encountered in the field to be reported and managed using specific inspection reports
- support the processes associated with the management of the forms completed in the field, with the possibility of attaching multimedia data as well.

Back by over 20 years of field project experience, Geocall is an innovative and entirely parametric software platform that features a wide range of highly

functional and technological vertical modules designed to support the activities of field technicians and maintenance personnel with planning, scheduling, and mobility functions, as well as integrated Augmented Reality and GIS systems.

Geocall does not require any further configuration, and is able to significantly reduce Field Service project times in areas ranging from maintenance to technical assistance and emergency services, which are provided by both internal and external personnel. It's a continuously evolving suite that's always up-to-date with the latest digital and mobile technologies, including wearable technologies, and Augmented, Virtual and Mixed Reality, thus offering considerable flexibility in terms of available functions. In this regard, there are ample possibilities for customizing and configuring parameters like resources, assets and services, for importing and creating Work Orders, and for assigning them to the most appropriate resource or team, as well as for conducting the relative supervision and monitoring activities.

- **FOX CRM**
- **A STRATEGIC ALLY**
- **FOR BUSINESSES**

CRM: three letters to indicate an intangible yet extraordinary business asset. They stand for Customer Relationship Management, and they denote a system that brings together all the customer relationship management strategies within an IT platform that connects three essential factors: devices, IT systems, and human resources. This type of system allows companies to determine the right customer engagement strategy, to understand their customers' requirements, and to respond appropriately to their need for a solid and lasting relationship.

The CRM platform is available in both cloud and on-premises formats. The latter, which is installed on the companies' premises, requires advanced hardware and highly skilled technicians for the installation, configuration, and continuous updates. In light of these considerations, an increasing number of companies are adopting the cloud CRM model, which does not require the software to be installed on the computer or any other devices, and provides access to the CRM platform via the Internet, thus rendering it available at all times and from any PC or mobile device.

For several years now, WebResults has been supporting a constantly growing working group belonging to ENGIE, a major producer and distributor of gas and electricity, which ambitiously aims to modernize its infrastructures and its portfolio of IT solutions by developing an innovative customer relations management platform, thanks to which it has succeeded in obtaining 1.3 million new retail customers and 1,000 new business customers over the past few years.

The CRM platform is based on cloud technology, and implemented on a salesforce.com platform.

The project has undergone multiple development phases and new system update releases:

- the first version was delivered to the company in just four months, thereby allowing it to use the CRM platform to manage the acquisition of new electrical power customers
- the second version supported its dual-fuel (gas and electricity) offering by allowing cross-selling and by permitting the billing service
- the third version of the system offered new services, such as the management of the customer's switching process, by creating a switch factory

- the fourth release, which came at a time of considerable customer base expansion, provided support for the B2B customer segment (provided through a dedicated CRM service) and introduced self-service channels for the customers
- the fifth version, which was released in late 2014, improved the self-service aspect for the customers with the eCRM platform, and implemented the 2013 pilot project regarding a cognitive self-learning engine capable of managing asynchronous channels and automatically responding to almost half of the customer requests.

By providing the company with an effective tool for its dual-fuel offering and allowing it to operate with speed and flexibility, the FOX CRM solution has been essential for helping ENGIE launch and develop its business activities as an electricity and gas provider.

• SMART PRODUCTION WITH • **AUTOMATED WAREHOUSES**

The future of industry lies in the field of logistics. This is confirmed by international analyses, as well as by the best practices of several e-commerce giants. But Logistics can only become a strategic factor for a company if structured in an innovative manner, and built around new technologies. In fact, the adoption of automation systems for warehouse management and handling operations has proven to be a strategic choice for companies that manage high volumes of products with different storage requirements or that need to be coordinated with an external transport system. One example of successful “smart production” is a green-field project (on a virgin site) carried out by Engineering for a leading company in the Italian food industry, which commissioned an automated warehouse for the storage and management of its products. The underlying need was to obtain a single centralized location capa-

ble of coordinating the flow of goods from multiple production plants where the customer intends to increase production and shipping volumes.

Engineering’s Solution Architects came up with an IT infrastructure based on the SAP Extended Warehouse Management (EWM) platform, which is capable of managing a high volume of complex operations and simplifying the logistics processes. The adoption of advanced Business Intelligence tools integrated with data warehouse systems has also allowed for the complete automation of the processes and equipment, which can be remotely monitored and managed using mobile systems.

The result is an unmanned hub that’s able to receive platforms from the 7 production buildings 24-hour-a-day, complete with automatic forklifts capable of storing up to 2,400 pallets per day, in coordination with 50 outgoing trucks.

The presence of extensive roller conveyors connecting the warehouse to the production facilities allows the goods to be transferred automatically to the storage area, while the synchronization of the shipping yard facilitates the coordination of the handling operations with the movements of the vehicles entering and exiting the site. The weight and dimensions of each platform entering the warehouse are checked by control systems, and the platform is only permitted to enter the warehouse if all the product requirements are met. At that point, it is collected by a trolley, which brings it to the most suitable storage area for the product in question, based on the platform’s size and weight and the relative temperature requirements. Each aisle has an automatic forklift with telescopic forks that continuously carries out the storage and retrieval activities among the storage racks, which are up to 40 meters high. Thanks to the presence of a double-deep rack, the forklift is able to optimize time by transporting multiple

platforms simultaneously. The saturation of each room and the number of platforms on each conveyor belt are constantly monitored in order to better manage the flow of goods, with an alert message being generated whenever the preset thresholds are exceeded.

The shipping yard even has an area dedicated to the automatic preparation of the outgoing goods. Here, the goods are transported and distributed along gravity rollers, which lead them to the trucks waiting to be loaded. The loading phase is the only operation performed by a worker, but the operation itself is overseen by a monitor, which allows the user to check the progress of each platform and truck present in the shipping yard. The driver receives a text message indicating the date and time of loading and the transport number to be entered into the totem upon arriving at the warehouse, in order to ensure that access is only granted to authorized personnel. The loading is only completed if the quality controls managed by radio, and carried out upon 50% of the goods, are passed. Furthermore, in order to coordinate the movements of the vehicles in the shipping yard, monitoring tools have been installed to check which vehicles have finished loading and which are still waiting.

In the end, the completed automated warehouse perfectly met the customer's expectations, thus ensuring the optimization of the high-volume logistic processes, which are difficult to manage without automation. The solution proposed by Engineering makes every storage activity more efficient, while at the same time constantly monitoring the resources, thus simultaneously increasing productivity and accuracy thanks to a reduced risk of manual errors. Space and time are both maximized.

The project is therefore aimed at meeting the considerable need expressed by the population, while at the same time encouraging new users to make use of the public transport system by promoting an increasingly

modern and sustainable form of urban mobility that will decrease traffic and reduce the number of cars on the road.

● THE VIRTUAL FACTORY ● IN THE UNITED STATES

Having arisen in the 1990s, and being conceptually linked to the Maker Faire and Fabrication Laboratory (FabLab) movements in Italy, Digital Manufacturing has come to represent one of the areas of greatest potential, and has shown considerable growth dynamics with regard to the digital "machinery" market, the organizational impact that the new business models have on companies, and the opportunity to develop application solutions. This dimension, which is so innovative and, within the urban context, is so loaded with social expectations at the service of the community, is becoming increasingly industrialized and inserted within a production scenario that's looking for new tools for innovation.

Digital Manufacturing entails original ways of reconsidering a company's positioning, as well as its organization, production planning, distribution process, and supply chain. The engineering of the technological complexity is simplified, and new applications and new materials with variable mixes and densities are developed. Not just 3D printing, but innovative design, and software and IoT solutions.

In the United States, at the request of the Department of Defense and the Navy, Engineering has been engaged in a five-year project aimed at finding new Digital Manufacturing solutions to be applied to the Aerospace and Defense sectors. Engineering has proposed transforming the customer's current production systems into the virtual factory of the future, or rather creating a full digital enterprise in which the robotics and production automations are perfectly integrated with the digital planning and de-

sign. Integrated software platforms and advanced simulation models allow the system or the entire process to be viewed in a virtual manner before they are even begun. In this manner, production can be simulated based on various inputs, in order to monitor what might occur. A “digital twin” (i.e. an exact copy) of each process or product is created, which has all the same specifications as the physical twin, and is dynamically updated to represent the current state of the actual model. This “digital twin” can be subjected to tests and trials in order to avoid potentially costly problems or errors, which could even result in delivery delays.

At this point, within the virtual factory all the previously disconnected production phases are linked to one another via the digital thread, which allows information to be collected and used to ensure continuous improvement. The digital thread is used to create a digital package of information regarding the product, which is enriched during the course of its life cycle. The first data fed into this package are those linked to the design phase, which are used in the simulation tests to evaluate the prototype’s performance and to determine how to make it. This information can even extend to the operators who assemble the product, in order to provide them with instructions and facilitate their activities. Useful information can even be obtained after the product has been launched on the market, in order to evaluate its performance or any required maintenance. If the consumer of the finished product encounters a problem during use, the digital thread can be retraced in order to determine what caused the problem and figure out how to correct it, after which the production process can be simulated again in order to perfect it. Continuous improvement is therefore guaranteed within a digital factory: every process output can be reused as input information for the

previous process, so that every part of a newly produced product is better than the one assembled just a few seconds earlier.

Therefore, in addition to the processes, the entire structure itself becomes digital in order to fully exploit the potential of the digital thread: everything becomes efficient and integrated, and the information collected allows companies to amass a wealth of useful knowledge whenever new products are introduced on the market, thus ensuring greater efficiency.

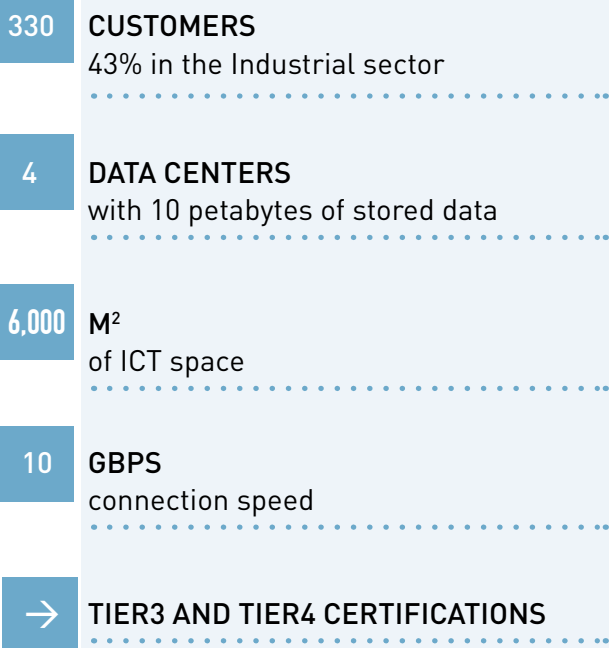
The virtual factory even provides for improved workplace safety, as it offers a simulated preview of the factory workers’ working conditions, thus allowing any risks to be detected and prevented. Moreover, the most difficult tasks can be simplified, and can be even carried out by less skilled workers, thanks to the use of wearable augmented reality devices, through which the instructions can be viewed in 3D.

The digital thread and the digital twin are two approaches that can be implemented in every industrial sector, as they provide consumers with a custom service. Furthermore, thanks to the predictions made with the augmented reality simulations, the adoption of these concepts even becomes a competitive advantage for those who use them, as they facilitate strategic decisions with concrete data. Compared to a “real” factory, a virtual factory offers greater process flexibility, and is therefore able to respond more quickly to any changes in the market. Engineering does not believe that the benefits offered by digital factories are limited to companies alone: in fact, the countries that adopt the digital thread concept and integrate it within their industrial systems will have a positive impact on the growth of the economy, as was the case during the previous industrial

revolutions. In this scenario, the workers currently operating within the production sector even become increasingly qualified, as they are assisted within the virtual factories by the robotics used to perform the more manual tasks, thus allowing them to dedicate themselves to jobs requiring specific skills.



DATA SECURITY



Society and the global economy are becoming increasingly dependent upon new digital technologies, and this has made Cyber Security and Security Intelligence essential for private citizens, businesses, and the Public Administration. While on the one hand the increasingly widespread and pervasive use of digital technologies offers new possibilities in terms of connectivity, thus encouraging the dissemination of information and the development of new business models, on the other hand it exposes us to new risks, including attacks by cyber criminals, who often try to steal data and compromise the functionality of critical structures.

For nearly 20 years now, Engineering has distinguished itself on the market by its ability to operate data centers and manage IT infrastructures for more than 250 large companies throughout Italy and around the world.

Positioning itself as a guarantor of high quality lev-

els, and boasting unique know-how in the management of sensitive data, the Company is capable of greatly reducing the risks associated with the breach or loss of its customers' information assets.

In this regard, as a confirmation of its desire to become Italy's leading IT security player, in 2017 the Group decided to centralize its entire Cyber Security market offering within Engineering D.HUB. To this end, the Group wanted to create a single company with an large virtual team consisting of all the specialized figures from the various markets in order to centralize their activities, without dispersing their skills, and a series of proprietary solutions derived from years of experience in the field of IT systems.

D.HUB's Cyber Security offering is divided into several macro-areas.

Security Compliance Services: business compliance consultancy services that help customers undertake pathways of compliance in relation to Privacy/GDPR, the ISO 27001 standard (Information security management systems), and the ISO 22301 standard (Business Continuity Management).

Managed Security Services: the centralized Services of the Security Operation Center, which helps customers monitor the security events generated by their infrastructures, assists them with the management of the incident process, helps them manage the evidence collection and retention requirements for regulatory purposes, supports them with an early advisory service, helps them monitor their level of exposure to cyber threats through ongoing fleet vulnerability monitoring programs, helps them manage their security infrastructures through managed security services, and supports them with value-added services, such as protection against massive DDoS (flooding) attacks, etc.

Security Projects & Consulting: professional services for the implementation/updating of the following types of services: network security, log collection

and evidence analysis, access rights management, advanced data repository (DB or file system) protection.

Ethical Hacking Services: (vulnerability assessments or penetration tests) aimed at verifying the resilience of the customer's infrastructure or the applications published on the infrastructure.

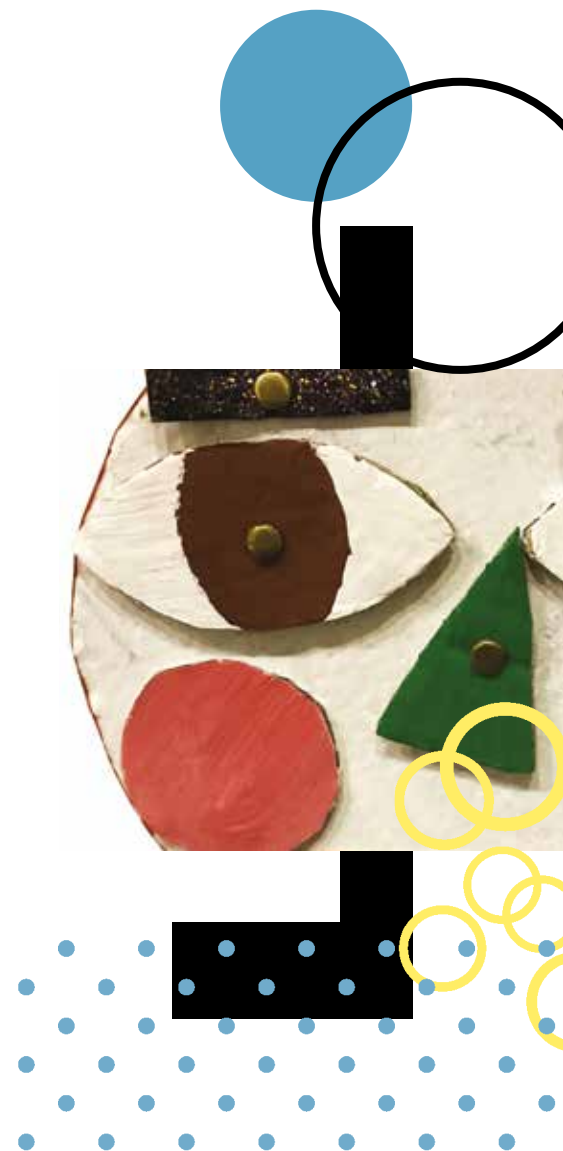
System Integration Services: such as the implementation of Identity Access Management solutions, the integration of security tools with central governance systems, the improvement of the customer's physical security infrastructure.

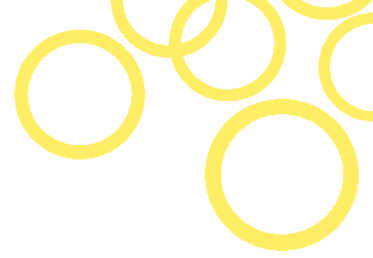
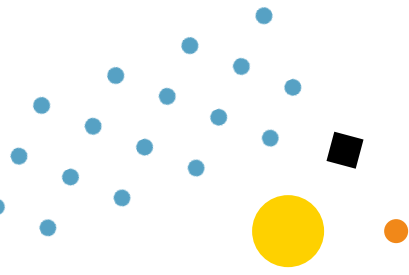
Engineering provides its customers with data storage services at its own Data Centers located throughout the country. The four Data Centers owned by the Group cover an area of nearly 6,000 m² and already house more than 20,000 servers with over 10 petabytes of data. Over 2 million tickets (intervention requests) are processed each year for the tens of thousands of applications that run on servers. An NOC (Network Operations Center) and SOC (Security Operations Center) control infrastructure, consisting of instruments and qualified supervisory personnel, guarantees 24/7 assurance of contractual service levels and protection against attacks, with billions of events being monitored, correlated, and analyzed on an annual basis.

Compliance with market standards like ISO 27001, the certification of the Data Centers according to the Uptime Institute Tier4 standard, the automation of the operations management activities, and staff competence are all key elements for guaranteeing the continuity of the customers' business, the necessary segregation of the data, and protection against external attacks.

The ability to balance skills and solutions in the field of security, and, above all, to combine resources and components for consulting, compliance, manage-

ment and automation purposes, allows for the creation of comprehensive service packages tailored to meet the customers' actual needs, which are often too intricate and complex (especially for enterprise customers) to be addressed with individual tools or standard solutions.





THE GDPR AND THE ROLE OF ENGINEERING

As of May 25, 2018, EU Regulation 2016/679 (known as the GDPR - General Data Protection Regulation) concerning the protection of natural persons with regard to the processing and free circulation of personal data, is directly applicable to all legal subjects within all EU Member States. As indicated by the EU Commission itself, the GDPR arose due to the specific need for legal certainty, harmonization, and a greater simplification of the regulations governing the transfer of personal data from the European Union to other parts of the world. The new regulation introduces new aspects for the protection of personal data in terms of their availability, integrity, and confidentiality.

These include:

- the proactive elimination of the data (Right to be forgotten), according to which, once the necessary conditions for the processing of the personal data cease to exist, they must be proactively eliminated.
- the obligation to promptly disclose any breaches of privacy to those affected within 72 hours
- accountability, or rather the obligation to demonstrate all the privacy measures adopted in compliance with the European Regulations
- analysis and impact assessment on data protection
- organizational supervision, with the obligation to appoint a Data Protection Officer for the public authorities or if the organization's activities consist of processing operations that require the large-scale monitoring of particular categories of personal data (sensitive data, genetic data, biometric data,

judicial data, etc.).

One aspect that will have a greater impact upon the management of security within organizations regards loss of data. The need to identify and report such violations will require companies to have a greater ability to effectively detect incidents by monitoring the critical issues encountered within their own information systems. Organizations could therefore be compelled to obtain more information on security incidents (which currently aren't widely distributed), the lack of which poses a limit with regard to the use of risk management systems based on risk assessments.

In response to the GDPR, Engineering D.HUB offers assistance in planning the regulatory adaptation of processes and infrastructures with respect to the Regulation's provisions. The process essentially starts with a gap analysis being performed upon the management model, which identifies roles and responsibilities, and analyzes the current situation. At the same time, the roles and responsibilities, policies and internal procedures are codified.

The activity then continues with the re-elaboration of the previously identified requirements, which are designing so as to ensure that the processes comply with the new European regulation. The process concludes with the Infrastructure Compliance phase, in which solutions designed to effectively support the business requirements are provided. After having completed the remediation design phase, Engineering D.HUB further supports the customer during the management phase by offering services and consulting.

THE EUROPEAN CYBER SECURITY PROJECTS

- 16
RESEARCH
projects in progress, 11 of which
are coordinated by Engineering
- 10
MILLION
in funding for ongoing research projects
- **FIGHT AGAINST CRIME
AND TERRORISM**
6 projects in progress and 3 completed
- **CYBER SECURITY**
5 projects in progress and 7 completed
- **BORDER SECURITY AND DEFENSE**
3 projects in progress and 3 completed
- **CRITICAL INFRASTRUCTURE
PROTECTION AND DISASTER
RESILIENCE**
2 projects in progress

At the European level, Engineering has increased its activities associated with the Horizon 2020 research and innovation program, especially with regard to the four areas defined in the European Community's IT security strategy:

- **Fight Against Crime and Terrorism:** in terms of innovative Security Intelligence solutions and services, and investigative support for law enforcement agencies
- **Cyber Security:** in terms of information security for the protection of digital assets and the IoT.
- **Border and External Security:** for the protection

of the national and European borders, for the purposes of which the company's counterpart is the border police and all the authorities with border protection duties

- **Protection of critical infrastructures:** for the management and planning of the infrastructures' resilience in relation to any disasters of natural or human origin that might damage strategic assets like the power or water grids, financial and telecommunications systems, means of transport, or sensitive industrial sites like chemical plants.

The Group's research activities have also been consolidated and expanded in recent years through its involvement in numerous projects and networks. In particular, Engineering's Research and Development laboratory coordinates the Cyber Security working group of the EOS (the European Organization for Security).

Engineering also helps coordinate the Cyber Security for Smart Cities working group, and participates in the Strategic Research Agenda for Cyber Security working group at the ECSO, an organization established by the European Commission in mid-2016 for the purpose of defining the contractual Public Private Partnership (cPPP) for Cyber Security.

Engineering's Security Intelligence research unit has frequent interactions with the European Commission's Directorate-General for Migration and Home Affairs on issues concerning counter-terrorism.

▶ THE PROTECTION OF CRITICAL INFRASTRUCTURES IN HYPERCONNECTED SOCIETIES

by **LUIGI ROMANO**

Modern society has become hyperconnected, and cyberspace, or rather the place where Internet-based operations take place, is undergoing unprecedented development thanks to the spread of broadband. Within the context of the provision of services of great interest to the community and national security, the increasingly widespread and pervasive use of Information and Communication Technologies requires us to reflect upon the intricate and increasingly complex problem of the security of connected technologies and critical network systems, which consist of complex systems made up of a large number of functional networked hardware and software units with stringent security, reliability and performance requirements.

There has been an exponential and qualitative-quantitative increase in cyber attacks in recent years, which places the security of information a serious risk.

In just one year's time, the cyber threats against Italy's critical infrastructures multiplied by a factor of

five, with the number of alerts amounting to 28,500 in 2017, and the actual attacks amounting to 1,006. These figures were certified by the Postal Police in their 2017 financial statements.

In addition to system continuity, the attacks often target information that falls within the category of sensitive data, the improper processing of which can lead to serious violations of the freedoms and fundamental rights under the new General Data Protection Regulation (EU) 2016/679 (GDPR), which, as is well known, establishes a new European legal framework for the protection of personal data by requiring companies and public administrations to adopt technical and organizational measures for the legal, secure and transparent processing of personal data.

As already highlighted in the White Paper published by the CINI National Cyber Security Laboratory, the phenomenon appears to be so widespread as to require a unified response by the national economy. In fact, Cyber Security is a common social issue of maximum importance to growth and well-being, which

● **TRILLION** ● SOCIAL NETWORKS FOR THE ● SECURITY OF CITIZENS

The Digital Transformation at the service of citizens' security. A scenario that's not only possible, but probable, and, thanks to new technologies, is even capable of giving rise to the "proximity policing" invoked by many. In fact, through the development of new two-way channels of collaboration between citizens and Law Enforcement Agencies (LEAs), the Trillion project helps speed up the identification of risks, facilitate their prevention, and establish effective

collaboration that will encourage citizens and law enforcement to work together.

Engineering coordinates the project, while at the same time providing the system's global architecture and engaging Italian users. This European socio-technological platform is aimed at facilitating and streamlining collaboration between citizens and law enforcement agencies. The platform's operating environment is not just limited to the immediate management of a crisis, but also extends to the period immediately prior to it, thanks to the rapid identification and prevention of any imminent risks. The main challenges faced by the Trillion project include:

must be tackled by effectively improving the defense of critical national infrastructures, governmental organizations, companies, and private citizens.

In particular, I believe that the three most complex areas in need of greater attention are the following: the protection of critical infrastructures, the security of the technologies that allow things to connect to the Internet (Internet of Things), and the security of data, applications and infrastructures in the cloud environment.

The FITNESS (Fault and Intrusion Tolerant Networked SystemS) laboratory, which I have been directing for over ten years now, deals with the design, development and evaluation of network processing systems that are even capable of functioning correctly in the presence of malfunctions caused by natural phenomena and deliberate attacks by criminals. In this context, we have observed a constant increase in systems classified by technical/scientific literature as emerging critical network systems.

These consist of applications for: e-banking, e-government, digital health and e-business; telemedi-

cine and remote surveillance; multimodal transport; space, air and rail control; critical infrastructures and the Internet of Things are also developing rapidly in order to ensure the secure management of the transactions between the objects that make up the IoT network, which still remains highly exposed to cyberattacks. These systems must also guarantee proper functionality in the presence of malfunctions and attacks, albeit to a reduced extent.

While some important results have already been achieved on these issues, in Italy there is still a lot to do in terms of investments and the ability to develop new tools, because there is now a clear correlation between a country's economic prosperity and the quality of its cyber infrastructures within the national production system and the Public Administration.

Luigi Romano

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establishing the confidence necessary to stimulate the provision of information, ensuring that the information is realistic and credible, and using the data collected through secure two-way communications, which guide the actions of those in the vicinity of an identified risk situation.

The Trillion project is developing a complete service platform and mobile applications (even on wearable devices) that support real-time collaboration between law enforcement officers, first responders and citizens, while at the same time ensuring the confidentiality and protection of the data collected.

● **COMPACT** ● **PROTECTING THE PUBLIC** ● **ADMINISTRATION AGAINST CYBER** ● **ATTACKS**

The constant increase in the number of cyber attacks against the Public Administration, and their heightened level of sophistication, are threatening the proper functionality of Italy's institutions. This is explained by the 2017 policy paper titled Cyber Security in the Public Administration, which was drawn up following a public sector managerial course organized by the School of Government at Luiss Guido Carli University.

The document explains how vulnerabilities must be both prevented and resolved by optimizing the ICT structures' performance.

Rather than a state that must be maintained in order to be preserved, IT security must be seen as a process. The document therefore suggests conducting penetration testing in order to assess the vulnerabilities of Public Administration services and critical infrastructures of national interest, after which countermeasures can be proposed based on the same.

Technological threats are constantly increasing, and represent the most significant risk faced by Public Administrations. However, technological, organizational and structural issues are hindering their ability to improve their levels of IT security, especially among local public administrations (LPAs). The situation is made even more complex by budget constraints, and by legal, ethical, social, and privacy regulations.

With the COMPACT project, Engineering aims to provide LPAs with the tools and skills necessary to take charge of the process of improving their protection against IT attacks. The project's specific goals are:

- to increase awareness, skills and protection
- to promote the exchange of information among Public Administrations throughout Europe
- to connect Local Public Administrations with the main EU initiatives, including the newly formed public-private partnership on IT security.

The COMPACT project's innovations are applicable at both the technological and process levels, which is an important aspect in terms of getting the LPAs' staff involved in improving their protection against cyber attacks.

At the process level, the COMPACT project adapts the Plan-Do-Check-Act (PDCA) methodology to the LPAs in order to allow for the repeated removal of the security hurdles, and to ensure compliance with the EN

ISO/IEC 27001 and BS ISO/IEC 27005 standards.

The COMPACT project also provides an integrated support platform through various types of tools/services: risk assessment, learning based on a playful approach, and monitoring and knowledge-sharing services. All these services are characterized by a high level of automation and usability for non-experts. The results of the COMPACT project have been validated through five cases involving 5 users in 4 European countries.

90% of the COMPACT project's solutions will reach a high level of Technological Readiness (TRL7, demonstration in the operational environment), while the remaining parts will reach the TRL6 level (demonstration in a relevant and realistic environment). Engineering is responsible for the project's coordination, and will focus upon defining and supplying the entire platform, including the open interfaces. It will also provide the project with: the risk assessment tool derived from its experience with the Cyspa (European Cyber Security Protection Alliance) project, which has subsequently been developed; the CyberConnector collaboration platform (one of the Engineering Research and Development Laboratory's key assets); and OPENNESS.edu, the training platform developed within the framework of the VINCENTE research project, which is aimed at defining, implementing and testing a platform of services in support of ecosystems for sustainable entrepreneurship.

● MARISA ● MONITORING THE SEA'S ● BORDERS

On the one hand humanitarian needs and the rights of migrants and asylum seekers must be protected, while on the other hand States have the right to protect their borders against the threats of international

crime and illegal trafficking. This is the conundrum surrounding the control of Italy's borders at sea, where the situation is becoming increasingly serious and complex.

In this context, in view of the potential offered by technological innovation, Engineering has made a valuable contribution by creating the MARISA (Maritime Integrated Surveillance Awareness) platform, which fosters the sharing of knowledge, resources and services through the integration maritime surveillance data provided by various authorities operating in this field.

The safety of our seas and coastlines, which is becoming an increasingly important issue on the European agenda, requires constant collaboration among all the actors involved in maritime surveillance, especially among the administrations of the European Member States and agencies.

In order to address this challenge, the EU has launched numerous initiatives. The vast amount of "raw data" available can not be utilized by the current maritime protection support systems, as they are not accessible in real-time, and often aren't interoperable. The MARISA project's main objective, therefore, is to provide the agencies responsible for safety at sea with a tool for performing data analysis, and to make available a series of methods, techniques and modules, in order to correlate and merge heterogeneous and homogeneous data from different sources, including the Internet and social networks.

The MARISA project aims to facilitate the exchange of information among the various actors, and to streamline the decision-making process and reaction times, thanks to a more in-depth knowledge of the situation at sea, even in real time. The proposed solution provides mechanisms for obtaining in-depth information from any Big Data source, for

performing heterogeneous data analyses based on geographic and spatial representations, for using new and traditional search patterns to identify possible connections between events, and for exploring predictive analysis models to illustrate the effects of the interaction of the objects observed at sea. The MARISA project also provides reporting tools and ad hoc services to support the users and systems in their daily activities, and will also provide tools for viewing and navigating the data resulting from the data merge process.

The involvement of 5 industry operators as full partners will allow us to align the innovation with the users' needs and validate the toolkit through a series of cross country and cross domain tests.

● **STORM** ● SAFEGUARDING ● EUROPE'S ARTISTIC ● AND CULTURAL HERITAGE

As one of the world's richest countries in term of cultural and artistic heritage, Italy attracts millions of people each year. Italy has approximately 5,000 public and private museums and similar institutions open to the public. This wealth of cultural venues records over 100 million admissions on an annual basis. Protecting and preserving this heritage is therefore a major priority, not only for ensuring the protection of Italy's and Europe's cultural identity, but also because it generates wealth, and is a driver for economic growth.

Due to the vastness and complexity of this heritage, of the deterioration processes to which it is subject must be carefully examined in order to prevent problems from arising, which are often discovered after it's too late. Artistic and cultural assets are also in-

creasingly exposed to climate change and natural hazards, which threaten their integrity and could compromise their value.

The STORM project (Safeguarding Cultural Heritage through Technical and Organizational Resources Management) arose within this context as an international effort aimed at protecting Europe's cultural heritage. The project is coordinated by Engineering and is funded by the European Commission within the framework of the Horizon 2020 program's 2014-2015 work plan titled Secure societies - Protecting freedom and security of Europe and its citizens.

The STORM project's objective is to analyze, evaluate, and design a series of measures to safeguard Europe's artistic and cultural heritage, in order to maximize their effectiveness in space and time. All with an innovative approach aimed at rendering the underlying prevention processes more user-oriented, so that the citizens can gain a greater awareness of what the protection of these assets entails.

The aim is to improve the current state of the art by taking preventive actions aimed at preserving historical structures, and by anticipating and identifying appropriate emergency measures, thus creating a network of knowledge and tools to be shared among all the European partners. STORM tools and services are intended to provide a global and holistic overview of the entire value chain: an integrated reference framework that allows the cultural asset to be managed like the center of an ecosystem that improves its protection with the support of ICT technologies.

The project focuses upon the existing processes associated with three distinct areas: prevention, intervention, and planning and management policies.

With regard to the first area, the work consists of selecting, integrating, and perfecting the environmental assessment methodologies, in order to effectively analyze and map the environmental changes

and natural hazards, with the aim of implementing a support service capable of mitigating and minimizing their impacts.

As for the second area, software applications and maintenance tools designed to foster the rapid restoration and long-term preservation of the assets are currently being implemented, with the aim of ensuring the preservation of their historical and cultural integrity.

With regard to the last area mentioned, the STORM project's most innovative aspect lies in the creation of *stakeholder* communities dedicated to collaboration and knowledge sharing, with the aim of co-creating, sharing, and managing practices, knowledge and experiences for the sustainable protection of cultural heritage.

The project has a three-year duration (2016-2019), and involves 20 partners located in 7 different European countries (Italy, Greece, Portugal, the United Kingdom, Austria, and Germany) and in Turkey. The public sector Italian partners include the Ministry of Cultural Heritage and Activities (MiBACT) (through the Special Superintendency for the Colosseum, the National Roman Museum, and the Archaeological Area of Rome), the Ministry of the Interior (through the National Firefighters Corps), and the University of Tuscia, which are accompanied by two industrial companies: Engineering, as coordinator, and the Tuscan company Resiltech. At the international level, there are two additional ministries: the Greek Ministry of Culture and the Portuguese Government's General Directorate of Cultural Heritage.

The STORM project has been tested at experimental sites exposed to various types of threats, whose peculiar characteristics render them unique case studies. They are located in five different countries: Italy, the United Kingdom, Portugal, Greece and Turkey. The pilot sites, which are also project partners,

are the following:

- the monumental complex of the Baths of Diocletian in Rome (Italy)
- The Mellor Archaeological Trust in Greater Manchester (the United Kingdom)
- the Roman ruins of Tróia, near Setúbal (Portugal)
- the ancient fortress of Rethymno, on the island of Crete (Greece)
- the Grand Theater of Ephesus, in Anatolia (Turkey).

The first phase of the STORM project's work plan entails the verification of the major risk types in each experimental area present within the relative geographical territory.

The next phase is dedicated to the installation of sensors for monitoring the sites' atmospheric conditions and anthropic and environmental parameters.

The actual experimentation will be subsequently carried out at the pilot sites, followed by the evaluation of the results and, lastly, the study of the economic sustainability models of the infrastructure created.

According to the STORM paradigm, the interaction of all the subjects populating the territory surrounding the asset is crucial for the protection of the artistic and cultural heritage. In other words, all the categories of stakeholders (whether administrators, operators in charge of the assets' management and maintenance, prevention and emergency intervention supervisors, or private citizens) must have a dedicated channel of communication through which they can contribute to the protection of the cultural and artistic heritage.

The STORM project will be an exciting and ongoing challenge, above all due to the important role that cultural heritage plays for Italy. Being able to integrate the results of our scientific research into new

ICT services, which will help to preserve and protect Italian and European monuments from unavoidable threats, even of natural origins, will be the best way to exalt the value of our skills and our potential for innovation.

● SECURITY AWARENESS

● ATTENDING SCHOOL AT ENGINEERING

● TO CREATE A CORPORATE CULTURE

The human factor is one of the most critical Cyber Security management issues faced by companies and organizations operating in all sectors: in fact, one of the main causes of breaches are employees who are insufficiently trained to prevent attacks, and who often find themselves unwittingly acting as accomplices for hackers⁷.

The dissemination of an IT security culture is the key to addressing the problem. Without proper education, organizations are defenseless against aggression, because we can't defend ourselves against that which we do not know. For example, everyone knows that companies are exposed to the risk of ransomware (a new generation of malware that's becoming increasingly sophisticated and popular among hackers), which acts upon the weakest links in the chain: individuals who haven't been trained to deal with these types of attacks.

Security therefore is not a technological problem, but rather an organizational and process-related problem, and the average level of preparedness among Italian companies is still quite low in terms of IT security. In fact, it's not even unusual for a medium/large company to have no structure at all in charge of creating a corporate IT security culture. The most common situation remains that of the IT manager who's also in charge of IT security aspects, thus resulting in the problem being interpreted in terms of "service continuity risks."

⁷ Human Factor in IT Security (Kaspersky Lab, 2017)

Like any other form of education, the dissemination of a security culture involves two main steps: the involvement of the entire population in training programs, and the establishment of clear operating rules aimed at reducing the risk; all preferably accompanied by an organizational model that does not consider the issue of cyber security to be less important than other issues.

The approach to this topic has been improving in recent years. More and more companies have an actual security manager and are adopting industry standards like ISO 27001, although the overall percentages are still well below the average. In this sense, the regulatory requirements contribute to the growth of the national economy. Although the idea of imposing an awareness of certain issues is not exactly the best way to improve corporate security culture, it is nevertheless a way to force organizations to address the issue, and being subject to potential audits or penalties becomes a stimulus for development.

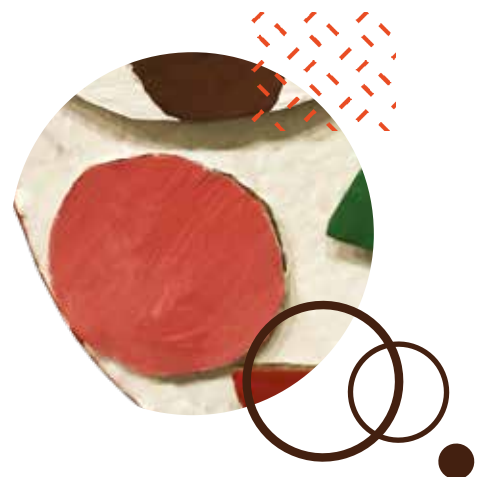
In light of the current scenario, for years now Engineering has been developing a series of consultancy services aimed at providing customers with staff classroom training through its own "Enrico Della Valle" IT & Management School, as well as through the professional services available on the customer's premises.

Engineering has a systemic approach based on the concept of "Security by Design", which, above all else, emphasizes the need for an awareness of the problem by creating a culture of security that allows for the management of certain cyber risks to be envisaged and, if possible, anticipated. This means encouraging all the organization's members to "think in terms of security", to talk about the issue, to discuss any shortcomings in the existing solutions, and to indicate any need for intervention. Security must

become a social issue within the context of the organization.

In order to obtain a greater qualitative return from its awareness-raising program, Engineering's training services make use of digital tools that work according to a logic similar to those used in advertisements by the media to continuously raise people's awareness.

For example, the employee training activities are aimed at explaining the risks associated with opening a suspicious e-mail, picking up a USB flash drive in the parking lot, or providing confidential information over the phone. There are currently only a few companies that pursue structured security awareness programs for their corporate populations, and this is certainly one of the open topics in which greater investments must be made in the future in order to mitigate the risks posed to the organizations.



WHEN INNOVATION BECOMES ECO-SUSTAINABLE

Environmental protection is imperative for any company that wants to leave its mark on human development, while at the same time contributing to the improvement of the public's well-being. The pursuit of environmental protection is no longer merely an obligation imposed by international directives, but is rather a moral duty for every business, as well as an opportunity for economic growth. In fact, by way of example, the application of ICT solutions to key segments of the economy, such as Industry, Energy & Utilities, and Transport, makes a significant contribution to major environmental challenges by ensuring resource savings and energy efficiency.

Innovation therefore plays a strategic role in relation to this issue, and Engineering has been engaged in projects targeting the market and research efforts throughout Europe for many years.

● HOME ENERGIA ● CONSCIENTIOUS AND SUSTAINABLE ● DOMESTIC ENERGY CONSUMPTION

Energy saving has become a complex problem due to the exponential increase in energy demand. In the European Union, the management of residential and tertiary buildings is responsible for 42% of energy consumption.⁸ This is a growing concern, because energy resources are limited, and global energy demand is expected to double by the end of 2030, with negative implications for the environment.

Ecology must become a primary objective for the homes of the future, as well as those of today. It is therefore necessary to begin developing innovative and efficient solutions that will make every home compliant with the latest sustainability standards. In this sense, "smart" has become the word of the

day. A smart home, for example, is a structure that's capable of helping its users properly manage their energy consumption. The implementation of such precise functionality, however, requires much more detailed information. In order to achieve this goal, the research efforts have led to the development of NILM (Non-Intrusive Load Monitoring) methods for analyzing consumption data. Engineering's solution exploits the Group's expertise in the IoT and Machine Learning sectors for reading and interpreting the consumption data in order to attribute them to the device/appliance that generated them. This solution represents a true revolution in the field of energy consumption control.

By using these types of systems, and choosing the right components, it is possible to monitor the electrical consumption of individual appliances, as well as the overall consumption generated by the home. The analysis of the consumption data allows us to understand the users' habits, and identify any incorrect behavior that can be improved.

The entirely Cloud-based Home Energia solution brings NILM technology to the home. From a single reading point on the main electrical panel, the aggregated current, voltage, and active and reactive power readings, as well as the relative harmonics sampled at over 1 kHz, are uploaded to the Cloud in real time by a smart meter, over a Wi-Fi connection (prerequisite of the home).

The project entails the construction and installation of a special smart meter at the homes of dozens of pilot users, and the creation of a central server for collecting the transmitted data, executing the NILM algorithms, and hosting a analytic web interface for consulting the disaggregated data.

Using NILM technology, Engineering aimed to cre-

⁸ Research conducted by Scenari Immobiliari.

ate a system capable of capturing the aggregated electrical load information at the user's home, processing it to extract significant parameters, and transmitting it to remote algorithms, where it is disaggregated in order to determine how much energy each device consumes at a given time. The system even allows the user to access their disaggregated data using a mobile devices for consultation and analysis purposes.

The Artificial Intelligence algorithms developed and continuously implemented by Engineering guarantee the disaggregation of the home energy consumption data in order to identify each individual energy-consuming device and its relative usage and consumption data.

The platform provides for two flows of information to the customer:

- real time: returns what happens at the home in real time
- periodic analyses: summaries, analyses, and reports elaborated and stored in the Cloud.

Furthermore, in order to keep the data load negligible with respect to the home's Internet bandwidth, the smart meter operates using edge computing logic. The adaptive disaggregation algorithms interpret the signals sent to the Cloud, and compare them with the energy fingerprint libraries of the various loads/appliances present. In this manner, the electrical device is identified, and its functionality is "monitored" using Fast Fourier Transformation analysis. The constant updating of fingerprints and an advanced Machine Learning methodology guarantee the algorithms' improvement and the solution's continued efficiency over time.

The Home EnergiA Smart Device also differs from other products on the market in terms of its installation type, which is completely integrated into the customer's electrical panel and can only be operated

by qualified personnel: this allows for communication independent of the distributor/meter pairing. The use of a solution of this type ensures greater security for the customer, fewer after-sales interventions for faults and support, and highly reliable readings compared to those obtained using traditional current clamps.

● ECOSPRAY AND ENGINEERING

● SHIPS MONITORED

● FOR POLLUTANT EMISSIONS

The continuous increase in maritime traffic driven by the cruise sector is raising awareness of the need to address the issue of the pollutant emissions generated by the engines used to propel and power these vessels. In particular, the main concern regards atmospheric sulfur emissions, which vary depending on the type of fuel utilized.

Since new and more restrictive rules are expected to be implemented in the coming years in order to reduce these emissions, all the shipping companies are currently preparing themselves using various strategies. The current challenge is to reduce SO₂ emissions using low sulfur fuels or EGC (Exhaust Gas Cleaning) Systems, commonly known as "scrubbers", which use salt water carry out the fume desulfurization (DeSO₂) process.

The main techniques for eliminating the sulfured compounds present within the fumes are carried out using desulfurization towers. Inside these towers, the stream of exhaust gas to be purified flows through a conduit and interacts with sea water, which serves to capture the pollutant compounds themselves.

Ecospray Technologies, a leading manufacturer of these systems, has patented its ECO-ECTM OPEN LOOP system, which uses sea water to eliminate the SO₂ contained within the exhaust gas. Its efficien-

cy always meets and exceeds the IMO limits for gas emissions and wash water quality, with no limits to the sulfur content in the fuel (up to 3.5%).

Ecospray Technologies, which was looking for highly specialized personnel with process automation skills to collaborate on the automation development and plant start-up phases, partnered with Engineering in 2015. Being a reliable and competent partner, Engineering initially integrated two of its technicians within the Ecospray Technologies working group. Within the span of 3 years, Engineering's support gradually increased, reaching a total of 6 units in 2017.

In particular, Engineering has contributed to the development of the control system software that allows for the autonomous management of the sea water pumps for regulating the towers' flow rates and for optimizing their performance and consumption. The GUI has been carefully designed and developed in collaboration with the on-board staff to ensure maximum ergonomics. Particular attention has been paid to the development of communication functions capable of interfacing with the system's various essential components, such as the fume and water analyzers, and shipboard automations.

Numerous sensors acquire information elaborated by the automation system in order to manage the process in complete safety and prevent flooding; the fume and wastewater analysis data are acquired and stored in encrypted databases.

● **RED** ● **AGAINST THE RISK OF AVALANCHES** ● **AND ROCKSLIDES**

According to the Legambiente 2017 Ecosistema Rischio data, the hydrogeological risk has rendered

Italy increasingly unsafe, due to climate changes that are amplifying the effects of landslides and floods. At least 7.5 million citizens live and work in areas at risk. 70% of Municipalities have homes in areas at risk, while 27% have entire districts in areas at risk, and 15% have schools and hospitals in areas at risk. Over the past five years, the country has recorded 102 extreme environmental events involving floods or landslides, resulting in 56 state of emergency declarations, for an economic cost of € 7.6 billion, and an even greater cost in terms of loss of life.

These figures clearly reveal the need for research and innovation projects capable of preventing these phenomena, in order to limit them whenever possible, and, above all, to prevent them from claiming additional victims.

Engineering is heading up a research project, funded by the Valle d'Aosta Region within the context of the 2014/20 Investment Program for Growth and Employment (FESR) and the 2014/20 Program in Support of Growth and Employment (ESF), aimed at creating an operational risk management dashboard linked to the phenomena of avalanches and rockslides. The RED (Risk Evaluation Dashboard) project intends to use specific algorithms to provide the information required by land management bodies in order to carry out careful and timely assessments of the type of mitigation action to be taken during emergency and non-emergency situations.

The RED project consists of three sub-projects belonging to two distinct operating units: the first deals with the modeling, monitoring, and management of data relating to hydrogeological instability phenomena through in-depth research, while the second is aimed at developing a complete, reliable, and easy-to-use software application capable of providing appropriate landslide risk scenarios and avalanche probability assessments.

▶ THE DIGITALIZATION OF ENERGY FOR THE DE-CARBONIZATION OF THE ENERGY SECTOR



by ANTONELLO MONTI

In my experience, digitalization plays an important role in the energy sector, especially in terms of supporting the de-carbonization process, and therefore in the fight against climate change. In particular, the growing role of renewable energy requires an increase in the application of intelligent systems in order to guarantee operational stability. In fact, the Italian mix of electricity production has witnessed a considerable increase in renewables in recent years, which needs to be supported by a change in the design, management and connection of the Italian electricity grid, and by support from end users throughout the market. The modernization of the energy system requires the automatic processing of data to be constantly balanced by a computer, on both a local and global level. In this sense, certain IT technologies, such as cloud computing solutions, offer major opportunities in terms of scalability and flexibility. In this regard, there has been a recent shift away from the smart electricity grid concept, and towards the neutral grid concept. Neutral grids represent much more than just the next genera-

tion of smart grids, which basically consist of mechanical transmission and distribution networks enhanced by pockets of automation, connectivity and centralized IT systems. In fact, neutral grids imply a much more powerful platform of hardware and software resources, which exploit ubiquitous connectivity, cloud computing, robotics and artificial intelligence to carry out a wide range of energy and non-energy related applications.

It is the last act of the grid's modernization, capable of transforming the existing infrastructure into a platform that will support a fully mature Energy Cloud environment. Much progress has now been made in this sense, even if a long-term vision for the system has not yet been established, despite several studies indicating that the distributed energy resources, like photovoltaics, energy storage, and microgrids, could provide a sufficient energy capacity to meet the global demand by 2035⁹.

With regard to the creation of a unified digital energy market within Europe, one successful instance that I would like to mention, because I follow it directly, is that of the FIWARE platform, whose network participants include both Engineering and

This instrument will therefore serve as a risk management support tool, by helping to define guided pathways of navigation among the processed data. In fact, the RED project is dedicated to meeting the need for an integrated product capable of acquiring and processing territorial and environmental data. The system will implement the existing databases, as well as new types of data obtained through the development of low-cost geophysical sensors and the performance of LiDAR (Light Detection And Ranging) surveys by helicopters. The dashboard is thus mainly

intended for Public Administrations, as an evaluation tool for local planning and management decisions, and for professionals, as a tool for conducting and supplementing in-depth sector studies aimed at facilitating the planning of risk mitigation measures. In the future it will also be available to freelancers who deal with the issues in question. In addition to Engineering, in its capacity as project leader, four other partners are also involved in the project.

⁹ From Smart Grid to Neural Grid (Navigant Research 2018)



the RWTH Aachen University research center, with which I collaborate.

FIWARE arose with the aim of accelerating the development and adoption of technologies for Europe's Future Internet, and its greatest contribution consists of the possibility of breaking down the so-called data-silos (i.e. the management and exploitation of information in watertight compartments) and sharing the data, from different sectors and ganglions of society, which are the true drivers of change, and can now be exploited and put to common use through Open Source technologies and platforms. This free exchange of data opens up countless possibilities. Within the context of the European FISMEP (FIWARE for Smart Energy Platform) project that I'm coordinating, we're significantly expanding FIWARE's energy applications.

In fact, FISMEP is exploring the possibility of creating an open cloud platform for energy systems. The project is analyzing a series of usage cases in three different countries, which involve the end-user's experience and behavior, smart build-

ings, and advanced network monitoring, as well as the automation of the DC network and its transfer to the FISMEP cloud platform. Our hope is that the work we're carrying out might help align the energy sector with other sectors in which FIWARE is already more active, thus creating new cross-sector opportunities.

Looking to the future, one of the IT developments with the greatest potential impacts in terms of sustainability that I foresee in the next 5 years is the possible convergence of the IT and telecommunications sectors. In this sense, the coordinated use of 5G and edge cloud computing opens up incredible possibilities in terms of distributed processing, which will come to play an important role in many sectors, including energy and transport.

Antonello Monti

Director of the Institute for Complex Systems Automation at the Technical University of Aachen (RWTH).

Among various other positions, he currently serves as coordinator for the European FISMEP (FIWARE for Smart Energy Platform) project.

● GREATER ENERGY EFFICIENCY FOR THE ● DATA CENTERS

The introduction of digital offerings, and the relative services made available to the end user, have led to an increase in ICT resources. In turn, this situation has generated an increase in the resources used at the data centers themselves, and, consequently, an increase in the energy requirements needed to manage them. Engineering's offering covers a particularly broad range of ICT services, and even includes a line of

Managed Services. This includes professional services associated with all sorts of data center issues, including design, security, Disaster Recovery, the Cloud, and data center optimization and efficiency. Through these services, Engineering offers itself as a reliable partner capable of identifying and carrying out transformation, rationalization, and consolidation processes for the technological infrastructures typical of data centers.

One of the most recent streamlining projects was carried out for the company Tiscali, which selected

Engineering as the full outsourcer for its Information Technology services. The main objective was to combine an improvement in the service levels offered to Tiscali's customers, with more efficient internal IT processes and a general reduction in management costs. Within the specific context of Tiscali, Engineering carried out a Data Center Transformation project, using the consolidation and optimization of the use and acquisition of ICT resources as the main drivers. The consolidation of the Tiscali data center involved the entire technological infrastructure associated with computing, storage, and the network, with all the possible optimizations being highlighted. The design work initially carried out highlighted the areas of intervention through which the new executive architecture was created, with the goals of ensuring greater resilience, scalability and efficiency. The percentages by which both the spaces occupied and the number of physical devices analyzed were reduced ranged from approximately 50 to 70%, depending on the technological area of reference: physical servers, storage, or network. The spaces occupied by the physical devices were reduced by about 70%. The physical servers, on the other hand, shown a reduction of 65%. Similarly, the storage and the network showed a reduction of 50% and 60%, respectively.

The transformation project also provided for a drastic reduction in the systems' energy consumption. In particular, the consolidation of the servers led to a reduction in electricity consumption of approximately 60%. That which was carried out for Tiscali therefore stands out as a particularly successful data center transformation project in terms of sustainability. The technological choices made during the execution of this project tended to lean towards virtualization and optimization, with the aim of saving resources and creating lean and efficient information systems, while at the same time ensuring greater resilience and scalability.

- **WEGO**
- **SOFTWARE AND SERVICES**
- **FOR ENVIRONMENTAL HYGIENE**

The explosion of consumption in industrialized countries has become a serious cause for concern in terms of both the quantity of resources available and the quality of the environment in which we live. Man not only continues to draw water and energy from the environment, thus rendering the available raw materials increasingly scarce, but also continues to disperse waste materials and pollutants, thus causing irreversible damage to the land, air, and water.

This problem can be tackled through integrated waste management. It is therefore necessary to valorize every resource from the time of its production, bringing the various phases of waste management together into one single process: collection, recovery, treatment and disposal. In fact, waste constitutes an enormous reserve of resources that, if properly managed and exploited, can guarantee a continuous and sustainable supply of materials and energy over the years.

In this regard, Engineering, Municipia, and Ekovision have entered into an agreement to offer companies and organizations operating in the environmental sector an integrated solution that brings together their respective skills and expertise. The agreement was stipulated following Municipia's acquisition of 19% of the share capital in Ekovision (thus positioning it alongside Sei Toscana, the company's historical majority shareholder), a company with considerable expertise in the ERP field that's dedicated to the design and development of software for companies operating in the waste sector, as well as the provision of the relative support services.

The solution resulting from the agreement, which can also be delivered via the Cloud, arose from the

logistical activities of vehicle management, measurement, and geolocation, and includes the scheduling of collection routes, industrial accounting, precise rate planning, and the management of physical and mobile contact channels in self-caring mode. It also includes the classic billing and back-office activities, collections and payment reminders, verification of tax evasion, and the management of the tax payer's file, notifications, and compulsory collections.

The integration of these services gave rise to Wego, a Web-based global environmental solution for companies operating in the environmental hygiene sector, which is aimed at establishing functional coverage for the same. These companies are thus able to rely upon a comprehensive solution, made up of products and consulting services, which is based on functional skills and new innovative technologies gained from over thirty-five years of experience, market presence, and technological research. According to Paolo Cenderelli, CEO of Ekovision, the agreement introduces this market segment to the concept of the "single point of contact": a single reference point that allows companies to optimize their processes and costs in an increasingly green world, and enables them to solve problems and face the challenges of the future with the help of qualified expertise and dedicated innovative technologies.

● **WAKOZA** ● SUSTAINABLE RESOURCES IN ● THE ZAMBEZI RIVER BASIN

As the demand for drinking water continues to increase, the world's available water reserves are becoming increasingly scarce. The greatest challenge therefore lies in the ability to distribute water equally among households, farms, and industries, as well

as among countries. The estimates¹⁰ indicate a 30% increase in demand for drinking water by 2030 due to pollution, which will reach unprecedented levels. Every day, two million tons of wastewater and other effluents are released into the environment without being treated beforehand. In most cases, the aquatic ecosystems' self-purification abilities are entirely insufficient. Up until 2025, half of the world's population will live in areas exposed to water stress, which will weaken local economies, forcing millions of people to find new homes. The challenge will therefore be to use water within the limits of its regeneration possibilities, and to distribute it fairly.

In this regard, on behalf of the European Commission, and the Joint Research Center in particular, Engineering Belgium is coordinating the WAKOZA project for the sustainability of resources in the Zambezi river basin.

Focused upon ensuring the sustainable use of resources in developing countries, the project is dedicated to innovative research and the integrated management of water, energy, and agriculture. The initiative arose from an ambitious partnership between the European Commission's Joint Research Center and a network of 20 African universities, with the support of Engineering.

The plan represents a broad and structured response on the part of the institutions, thanks to which three regional networks have been established in the areas of West Africa (with a focus upon the Niger and Senegal rivers), East Africa (for the Nile river basin), and Southern Africa (for the Zambezi river basin).

With a basin of 1.5 million square kilometers, and an average flow of 3,500 cubic meters per second recorded at the mouth, the Zambezi is Africa's fourth longest river. The Zambezi passes through eight dif-

¹⁰ Estimates by DEZA Globalprogramm Wasser.



ferent nations along its course, and its protection is entrusted to the Zanco, a river basin authority dedicated to the sustainable management of this water resource.

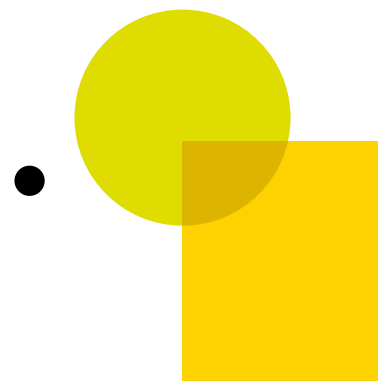
The basin has a current population of approximately 40 million people distributed in a non-uniform manner along the river's course, with several major urban centers and large expanses of desert in between.

Climate change is generating situations of water stress, with an increase in the frequency of extreme events affecting the region: especially in Mozambique, where the already considerable impact of these extreme events could potentially worsen. In this regard, through research and knowledge sharing activities, the project aims to create a complete framework of useful information that will allow policy-makers to make conscientious and, above all, sustainable decision relating to local development plans.

In light of the growth rate of the population, which,

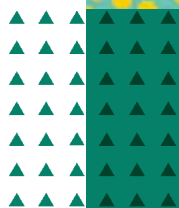
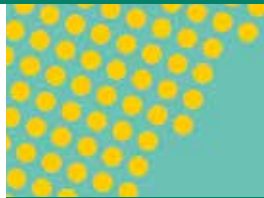
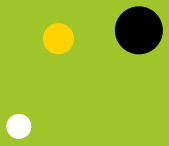
according to some estimates, could double in the coming years, the project aims to understand the potential impact of the demographic pressure increase on the river basin itself, based on the current knowledge.

Engineering's role is to assist with the coordination of the 10 university research centers, which collaborate with one another by sharing data, models, human resources, and knowledge. The goal is to obtain state-of-the-art knowledge of the hydrogeological, irrigation, and electricity production sectors that can be shared with policy makers through training and capacity building, using what has been defined as a "south-to-south cooperation" approach that's capable of filling in the local knowledge gaps.





APPENDIX



METHODOLOGICAL NOTE

GRI 102-1 GRI 102-45 GRI 102-46 GRI 102-48 GRI 102-49 GRI 102-50
GRI 102-51 GRI 102-52 GRI 102-53 GRI 102-54

The reporting standards adopted for the preparation of Engineering Group's fifth Corporate Social Responsibility Report (hereinafter also referred to as Engineering) are the "GRI Sustainability Reporting Standards." This report was prepared in accordance with the GRI Standards: Core option. The standard's indicators, which correspond to Engineering's material topics, are reported at the start of each chapter. The complete list of the standards utilized, along with the descriptions of the relative topics and in-depth disclosures, can be found in the GRI Content Index. Engineering's Corporate Social Responsibility Report refers to data, completed projects, and services provided by the organization in 2017, and indicates the main impacts resulting from Engineering's proj-

ects, with a particular focus upon Italy, where the Company conducts most of its operations and collects most of its revenue.

While the report also contains information regarding the foreign subsidiaries in terms of missions, activities and staff composition, the environmental data refers exclusively to Italy. The economic-financial data presented in this Corporate Social Responsibility Report are the same as those published in the 2017 consolidated financial statements, the audit of which was carried out by Deloitte according to the principles and criteria recommended by CONSOB.

For more information, please write to the following email address: csr@eng.it.

MATERIALITY ANALYSIS

GRI 102-46 GRI 102-47 GRI 103-1

The materiality analysis, which was conducted for the first time in 2014 and updated in 2016, began with the identification of the issues generally recognized as important because indicated within the Global Reporting Initiative standard, which is generally considered representative of the external perspective of the Company, as identified within the context of multi-stakeholder debate and discussion at the international level.

We then proceeded to evaluate the sustainability issues covered by the corporate documents, such as the policies, internal procedures, the Code of Ethics, and the previous Corporate Social Responsibility Reports.

The second phase for the identification of material topics has aimed at identifying the aspects of sustainability more closely related to the business of Engineering and relevant to the field of Information Technology and the reference scenario.

With this objective, the following were analyzed:

- the GRI (Global Reporting Initiative) document “Sustainability Topics for Sectors: What do stake-

holders want to know?” with regard to the “Software as a Service” sector

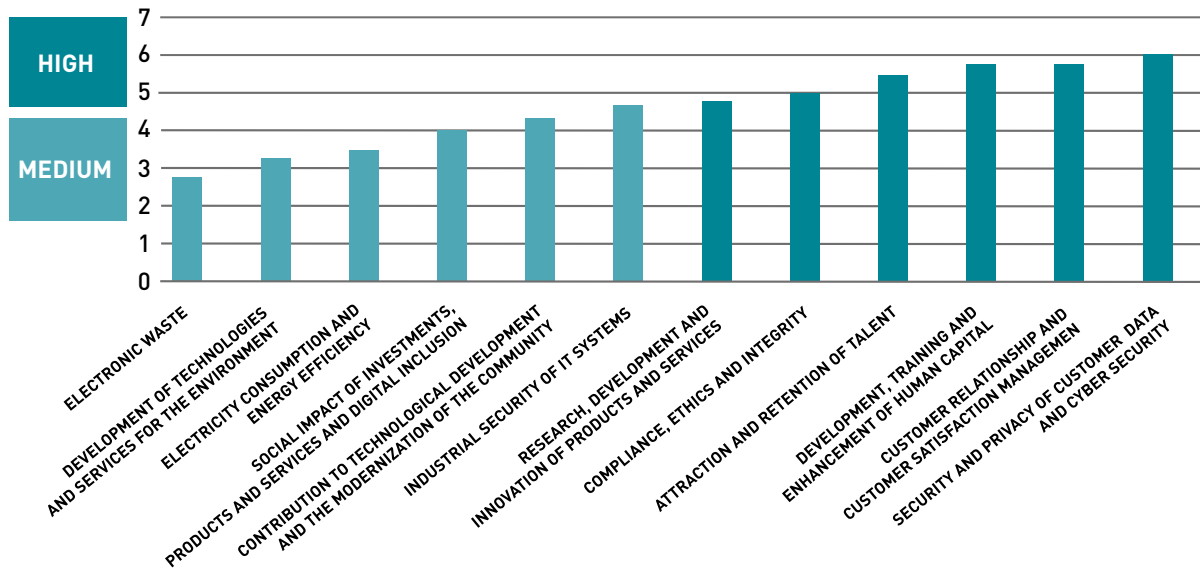
- the SASB (Sustainability Accounting Standards Board) Materiality Map with regard to the “Technology and Communications” sector and, in particular, the “Software as a Service” sub-sector
- the report of the GeSI (Global e-Sustainability Initiative) “#SMARTer2030, ICT Solutions for 21st Century Challenges”
- the 2016 Yearbook of RobecoSAM, with regard to the “IT Services & Internet Software as a Service” sector.

The list of topics that emerged during the course of the preliminary analysis was discussed, analyzed and weighed during dedicated interviews involving all the Company’s top executives, using an approach that allowed the top management to evaluate each Corporate Social Responsibility issue from an internal perspective (in relation to the Company) and an external perspective (in relation to the Group’s external stakeholders).

RESULTS OF THE MATERIALITY ANALYSIS

Corresponding Material Topics	Priority	GRI Aspects	Scope Internal relevance	External relevance
Security and privacy of customer data and cyber security	High	Privacy of customers	Engineering	Customers
Management of customer relations and customer satisfaction	High	-	Engineering	Customers
Development, training and valorization of human capital	High	Staff training and development	Engineering	
Attraction and retention of talent	High	Employment	Engineering	
Compliance, ethics and integrity	High	Employment Socio-economic compliance	Engineering	Customers
Research, development and innovation of products and services	High	-	Engineering	
Industrial security of IT systems	High	-	Engineering	Customers
Contribution to technological development and the modernization of the community	Medium	Economic performance Indirect economic impacts	Engineering	Customers Community
Social impact of investments, products and services and digital inclusion	Medium		Engineering	Customers Community
Energy consumption and energy efficiency	Medium	Energy	Engineering	
Development of technologies and services for the environment	Medium	-	Engineering	Community
Electronic waste	Medium	Waste	Engineering	

PRIORITY DETECTED IN THE FACTORS OF MATERIALITY



Why these topics are important for Engineering

Security and privacy of customer data and cyber security: Engineering stores and manages a great deal of information of various kinds at its Data Centers, a large volume of the data of the National Health System, the Central and Local Public Administrations and customers of all the productive sectors of the Country. Data security and privacy is therefore an issue of primary importance. The Group is also actively engaged in the planning and provision of external cyber security services.

Management of customer relations and customer satisfaction: Engineering's activities, which include a wide-range of business integration, application and infrastructural outsourcing and strategic consulting services, are characterized to a significant extent by the fact that they need to adapt to the businesses and requirements of its customers (more than 1,000) with whom it is therefore necessary to maintain a constant relationship and a satisfaction survey system that can measure the effectiveness and quality of the company's work and strategy.

Development, training and valorization of human capital: competing in advanced sectors, like that in which the Company operates every day, means that people are the primary resource for Engineering; therefore, within a context of continuous evolution that requires particular focus upon updating and developing skills and the creation of new professional figures (such as Data Scientists) through significant investments in training, the development and valorization of human capital is one of the company's priorities.

Attraction and retention of talent: the sector in which Engineering conducts its business is characterized by a limited market availability of resources with specialized IT skills; in this respect, it is important for Engineering to implement effective policies to attract the best talents from the job market, even in partnership with universities; likewise, the internal career development paths are designed to boost loyalty and retain the best resources within the Company.

Compliance, ethics and integrity: considering the large number of players with which the Group interacts (often of a public and institutional nature), and given the sensitivity of many of its projects and the information processed, Engineering is on the front lines in terms of preventing and combating unlawful behavior, in adopting and promoting ethical business conduct, and in guaranteeing maximum compliance with the applicable laws and regulations.

Research, development and innovation of products and services: research and development activities and innovation represent a critical factors for success on the market.

Industrial security of IT systems: ensuring the reliability of IT systems and infrastructures is a primary objective for Engineering, which operates on the market as a system integrator and designer of cutting-edge technological platforms.

Contribution to technological development and the modernization of the community: Engineering is the top Italian company in the IT sector, and is therefore by its very nature dedicated to making a major contribution to the technological and digital development of the community in which it operates, rendering available its skills and experience for the benefit of the country's modernization.

Social impact of investments, products and services and digital inclusion: Information Technology is having an increasing impact in terms of improvement of quality of life and social well-being, and therefore represents a possible response to citizens on the part of customers, especially in the Public Administration and Healthcare sectors.

Energy consumption and energy efficiency: the main environmental impacts attributable to the Group consist of the electricity consumption necessary to maintain the Company's four Data Centers, which also manage the information technology infrastructure upon which the Group's roughly 50 locations rely for their remote activities.

Development of technologies and services for the environment: many IT solutions are suitable for providing solutions to problems and reducing environmental impacts, and will be increasingly requested by customers operating in various sectors in the future.

Electronic waste: Engineering's business activities do not generate large quantities of waste. The most significant item, in this regard, consists of the electronic waste generated by the management of the Data Centers, and is due to the replacement of the systems' components; another significant item consists of the computers used at the offices.

OUR STAKEHOLDERS

GRI 102-13 GRI 102-40 GRI 102-42 GRI 102-43

The table shows the major categories of Engineering *stakeholders*, the main forms of engagement, and the frequency and types of activities whereby the Company communicates and interacts, based on an ap-

proach that considers the relationship's legitimacy, closeness, and power of influence, and the impacts upon the Group's activities.

Main categories of stakeholders	Engineering Map	Forms of interaction, listening, and engagement
Employees	10,273 employees located at 50 branches in Italy and abroad, including Belgium, the Republic of Serbia, Germany, Brazil, Argentina and the United States.	<ul style="list-style-type: none"> • Internal communication tools (newsletters, intranet, mailings) • Internal and external events dedicated to employees • Constant presence of the Personnel and Organization Department at branch offices • "Ingenium" corporate magazine
Clients	Approximately 1,000 domestic and international customers in the following sectors: <ul style="list-style-type: none"> • Local and Central Public Administration (Municipalities, Regions, Ministries) • Healthcare (Hospitals, LHAs) • Finance (large banking and insurance groups) • Telecommunications (all the major Italian players) • Energy (energy producers and distributors) • Industry • European and international institutions 	<ul style="list-style-type: none"> • Periodic satisfaction surveys • Continuous interactions with our staff of consultants • "Ingenium" corporate magazine
Suppliers	Suppliers concentrated in the following sectors: <ul style="list-style-type: none"> • instrumental goods (in particular hardware and software) • management and maintenance of real estate owned by Engineering 	<ul style="list-style-type: none"> • Daily interactions with the Procurement Department and the corporate functions involved in the activities carried out. • Dialogue with the main associations representing the suppliers • Suppliers' portal on the Website known as PAGE (the Engineering Group Procurement Portal) page.eng.it

Main categories of stakeholders	Engineering Map	Forms of interaction, listening, and engagement
Category and sector associations	National associations of the computer, software, ICT industries	Periodic meetings, preparation and sharing of good practices, participation in jobs within the technical and representation commissions
Financial Institutions	National and international banks and credit institutions that fund the Group's main investments	Meetings with top company management
Non-profits	<ul style="list-style-type: none"> • Associations for the promotion of the environment • Cooperatives/Non-profits 	Sponsorships, donations, sale of goods or services, projects in partnership, training and internships
Trade unions	Metalworkers' trade unions	<ul style="list-style-type: none"> • Collective and territorial contracts • Meeting with company union representatives
Universities and Research Institutes	National and European university and research institutes	<ul style="list-style-type: none"> • Development of partnership projects, economic support for research, training and support for product research and development • Business testimonies at educational institutions
Average	<ul style="list-style-type: none"> • Newspapers, magazines, national radio and TV • Industry journals • Newspapers, radio broadcasters and local TV stations • Online publications 	<ul style="list-style-type: none"> • Contacts on the occasion of the launch of important projects, publication of company documents, interviews, events • "Ingenium" corporate magazine
Project partners	<ul style="list-style-type: none"> • Small and large Italian and European companies (e.g., energy sector, healthcare) • European hospitals 	<ul style="list-style-type: none"> • Coordination within the context of projects funded by public European and national bodies • Development of partnerships

PERSONNEL DATA

GRI 102-8 GRI 401-1

Number of personnel employee by contract type and gender as of 12/31	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
Open-ended	5,588	2,465	8,053	6,050	2,631	8,681	6,990	3,037	10,027
Fixed term	58	25	83	99	62	161	143	103	246
TOTAL	5,646	2,490	8,136	6,149	2,693	8,842	7,133	3,140	10,273

Total workforce (expressed as average staff AWU) by nature of the employment relationship and gender	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
EMPLOYEES	5,188.83	2,214.9	7,403.73	5,748.45	2,417.28	8,165.73	6,657.08	2,792.35	9,449.43
CONSULTANTS	/	/	3,100	/	/	2,900	/	/	3,300

Total number of employees expressed as average staff/AWU by geographical area and gender (including employees and other types of non-employment contracts)	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
Northern Italy	2,166.74	1,022.23	3,188.97	2,416.30	1,131.01	3,547.31	2,660.2	1,250.69	3,910.89
Central Italy	1,972.31	888.33	2,860.64	2,144.10	926.63	3,070.74	2,379.08	1,058.73	3,437.81
Southern Italy and Islands	689.61	194.19	883.8	753.39	219.43	972.82	1,031.93	283.9	1,315.83
Brazil	329.3	98.66	427.96	332.62	92.05	424.67	365.94	104.54	470.48
Belgium	13	8.5	21.5	7.91	6.67	14.58	5.9	7.41	13.31
Serbia	9.97	1.32	11.29	14.55	6.32	20.87	14.82	5.33	20.15
Argentina	7.9	1	8.9	12.91	2.00	14.91	9.58	2	11.58
USA	0	0	0	0.17	0.17	0.34	51.71	6.99	58.7
Germany	0	0	0	66.50	32.99	99.49	135.26	71.76	207.02
Norway	0	0.67	0.67	0	0	0	0	0	0
Luxembourg	0	0	0	0	0	0	0.91	0	0.91
Spain	0	0	0	0	0	0	1.75	1	2.75
Other	0	0	0	0	0	0	0	0	0
GROUP TOTAL	5,188.83	2,214.9	7,403.73	5,748.45	2,417.28	8,165.73	6,657.08	2,792.35	9,449.43

Number of Group employees by Professional classification and gender as of 12/31	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
Managers	284	43	327	304	42	346	305	49	354
Middle Managers	1,275	401	1,676	1,323	406	1,729	1,481	456	1,937
Office Staff	4,087	2,046	6,133	4,522	2,245	6,767	5,347	2,635	7,982
Factory Workers	0	0	0	0	0	0	0	0	0
TOTAL	5,646	2,490	8,136	6,149	2,693	8,842	7,133	3,140	10,273

Breakdown of employees by age group, gender, and geographical area as of 12/31	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
ITALY									
Age < 30 years	373	197	570	433	235	668	553	263	816
Age 30 - 50 years	4,017	1,855	5,872	4,117	1,914	6,031	4,648	2,173	6,821
Age > 50 years	863	309	1,172	1,036	361	1,397	1,216	466	1,682
ABROAD									
Age < 30 years	116	52	168	212	43	255	258	64	322
Age 30 - 50 years	240	69	309	323	134	457	421	163	584
Age > 50 years	37	8	45	28	6	34	37	11	48

Number of personnel belonging to protected categories as of 12/31 by contract type	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
ITALY	212	129	341	236	139	375	266	155	421
ABROAD	0	0	0	0	0	0	0	0	0

Number of personnel with open-ended contracts by professional category and gender as of 12/31	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
Managers	281	43	324	300	42	342	301	47	348
Middle Managers	1,268	401	1,669	1,318	406	1,724	1,476	454	1,930
Office Staff	4,039	2,021	6,060	4,432	2,183	6,615	5,213	2,536	7,749
Factory Workers	0	0	0	0	0	0	0	0	0
TOTAL	5,588	2,465	8,053	6,050	2,631	8,681	6,990	3,037	10,027

Number of personnel with open-ended contracts by type of employment as of 12/31	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
Full Time	5,552	2,063	7,615	6,012	2,152	8,164	6,943	2,479	9,422
Part Time	36	402	438	38	479	517	47	558	605

Newly hired employees by age group, gender and geographical area as of 12/31	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
ITALY									
Age < 30 years	238	136	374	223	109	332	291	119	410
Age 30 - 50 years	507	153	660	839	226	1,065	793	355	1,148
Age > 50 years	69	12	81	218	42	260	123	63	186
TOTAL	814	301	1,115	1,280	377	1,657	1,207	537	1,744¹¹
ABROAD									
Age < 30 years	/	/	/	/	/	/	/	/	/
Age 30 - 50 years	/	/	/	/	/	/	/	/	/
Age > 50 years	/	/	/	/	/	/	/	/	/
TOTAL	/	/	91	/	/	317	/	/	416¹²
GROUP TOTAL	/	/	1,206	/	/	1,74	/	/	2,160

Outgoing employees by age group, gender and geographical area as of 12/31	2015			2016			2017		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
ITALY									
Age < 30 years	47	17	64	82	26	108	63	38	101
Age 30 - 50 years	221	98	319	661	159	820	214	82	296
Age > 50 years	49	10	59	225	44	269	103	24	127
TOTAL	317	125	442	968	229	1,197	380	144	524
ABROAD									
Age < 30 years	/	/	/	/	/	/	/	/	/
Age 30 - 50 years	/	/	/	/	/	/	/	/	/
Age > 50 years	/	/	/	/	/	/	/	/	205
TOTAL	/	/	91	/	/	317	/	/	205
GROUP TOTAL	/	/	533	/	/	1,114	/	/	729

Strikes and industrial disputes	2015	2016	2017
Hours lost due to sector strikes, pickets and industrial disputes	/	/	/
Hours lost due to national strikes, pickets and industrial disputes	/	/	/
Hours lost due to strikes, pickets and industrial disputes against the Company	387	3211	85.35
% strike hours out of total hours worked	0.003	0.025	0.001
Employee union membership rate	10.80%	10.31%	11.69%

¹¹ This data is broken down as follows: 809 new hires; 713 external company acquisitions; 53 branch acquisitions from external companies; 169 branch rentals from external companies.

¹² This data is broken down as follows: 313 new hires, 103 company acquisitions from external companies.

GRI CONTENT INDEX

GRI 102-55

The compliance verification carried out by the Global Reporting Initiative certifies the accuracy of Engineering's GRI Content index with respect to the requirements of the 2016 GRI Standards.



GENERAL STANDARD DISCLOSURES 2016

Indicator	Description	Page, references, notes and any omissions
Organizational profile		
102-1	Organization name	Methodological note Page 122
102-2	Main brands, products and/or services	Profile; Our business Page 12
102-3	Location where the organization's headquarters are based	Via San Martino della Battaglia, 56 - Rome
102-4	Name and number of countries where the organization operates	Profile Page 12
102-5	Ownership structure and legal form	Lots of companies, one single Group Page 12
102-6	Markets served	Profile Page 12
102-7	Size of the organization	Profile Page 12
102-8	Workforce characteristics (including significant changes) broken down by employment relationship and contract type, geographical area, and gender.	Personnel data Page 130
102-9	Description of the organization's supply chain.	Our suppliers: allies in the pursuit of quality Page 29
102-10	Significant changes during the period in question (size, structure, ownership, supply chain)	Profile; our business Page 12

Indicator	Description	Page, references, notes and any omissions
Organizational profile		
102-11	Modes of applying the precautionary principle or approach	The precautionary approach referred to under principle 15 of the Rio Declaration of the United Nations is applied by Engineering to protect the environment from the development to the introduction of new services and in planning its operational activities.
102-12	Subscription or adoption of sustainability-related codes of conduct, principles, and charters	Ethics and principles, the architecture of our business Page 22
102-13	Membership in national or international associations and organizations	Our stakeholders Page 128
Strategy of the organization		
102-14	Declaration of the highest decision-making authority (for example, CEO, Chairman or equivalent position) with regard to the importance of sustainability for the organization and its strategy.	Letter to stakeholders Page 8
Ethics and integrity		
102-16	Description of the organization's values, and the principles, standards and rules of conduct, such as codes of conduct, and codes of ethics	Ethics and principles, the architecture of our business Page 22
Governance		
102-18	Governance structure of the organization, including any committees that report directly to the highest governing body, including those responsible for economic, environmental, and social issues	A Corporate Governance that looks to the future Page 22
Stakeholder engagement		
102-40	List of stakeholder groups with which the organization is involved	Our stakeholders Page 128
102-41	Indication of the percentage of total employees covered by collective bargaining agreements	100% of the employees in Italy (therefore over 95% of the total workforce) are covered by the National Collective Labor Agreement - CCNL. With regard to the foreign subsidiaries, there is no collective labor agreement in Belgium, but instead there is a Commission Paritaire, which for our Company is no. 218; with regard to Engineering Do Brasil, there is only one type of contract and Engineering complies with the current legislation.

Stakeholder engagement		
102-42	Principles for identifying and selecting the main stakeholders with whom to undertake engagement activities	Our stakeholders Page 128
102-43	Approach to stakeholder engagement, specifying the frequency by type of activity carried out and by group of stakeholders	Our stakeholders Page 128
102-44	Indication of the groups of stakeholders who have raised each of the key issues and indication of the reports	No reports have been received other than within the context of industrial relations.
Reporting		
102-45	List of entities included in the consolidated financial statements and entities not included in the sustainability report	Methodological note Page 122
102-46	Process and explanation of the definition of the contents and scope of the topics contained within the sustainability report	Methodological note Page 122 Materiality analysis Page 123
102-47	List of all the material aspects identified in the process of defining the contents of the report	Materiality analysis Page 123
102-48	Effect of any changes to the information included within the previous sustainability reports, and reasons for such reformulations	Methodological note Page 122
Identification of the material aspects and scope		
102-49	Significant changes in measurement objective, scope, or methods used in the report, compared to the previous reporting period	Methodological note Page 122
102-50	Reporting period of information provided (for example tax year, calendar year)	Methodological note Page 122
102-51	Date of publication of the most recent corporate social responsibility report	Methodological note Page 122
102-52	Reporting interval (annual, biannual, etc.)	Methodological note Page 122
102-53	Useful contacts and addresses for requesting information about the sustainability report and its contents	Methodological note Page 122
102-54	Compliance with the "core or comprehensive" option of the GRI Standards	Methodological note Page 122
102-55	GRI Content Index	Gri Content Index Page 132
102-56	Indication of the organization's policy and current practices for the purpose of obtaining external assurance for the report	This financial statement has not been subject to external review.

TOPIC SPECIFIC DISCLOSURE

GRI Standard	Indicator / description	Page, references, notes and any omissions
MATERIAL TOPICS		
GRI 200 Economic Standard Series		
Economic performance		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Engineering's figures Page 20 Materiality analysis Page 123
	103-2 The management approach and its components	Engineering's figures Page 20
	103-3 Evaluation of the management approach	Engineering's figures Page 20 Our contribution to the country's economy Page 21
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	Our contribution to the country's economy Page 21
Indirect economic impacts		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 The management approach and its components	A more modern society at the service of the citizens Page 68
	103-3 Evaluation of the management approach	A more modern society at the service of the citizens Page 68
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	A more modern society at the service of the citizens Page 68
	203-2 Significant indirect economic impacts	A more modern society at the service of the citizens Page 68
Anti-corruption		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 The management approach and its components	Ethics and principles, the architecture of our business Page 22
	103-3 Evaluation of the management approach	Ethics and principles, the architecture of our business Page 22
GRI 205: Anti-corruption 2016	205-3 Confirmed incidents of corruption and actions taken	During the course of 2015, 2016 and 2017 there were no confirmed instances of corruption within Engineering Group.

GRI 200 Economic Standard Series		
Energy		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 The management approach and its components	Respect for the environment Page 62
	103-3 Evaluation of the management approach	Respect for the environment Page 62
GRI 302: Energy 2016	302-1 Energy consumption within the organization	Respect for the environment Page 62
Refusals		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 The management approach and its components	Respect for the environment Page 62
	103-3 Evaluation of the management approach	Respect for the environment Page 62
GRI 306: Effluents and waste 2016	306-2 Waste by type and disposal method	Respect for the environment Page 62
GRI 400 Social Standards Series		
Employment		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 The management approach and its components	New professional figures to write our future Page 34
	103-3 Evaluation of the management approach	In search of new talents Page 34
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	Personnel data Page 130
Personnel training and development		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 103
	103-2 The management approach and its components	Ongoing training to stay competitive on the market Page 44
	103-3 Evaluation of the management approach	Ongoing training to stay competitive on the market Page 44

Personnel training and development		
GRI 404: Training and education 2016	404-2 Programs for upgrading employee skills and transition assistance programs	Ongoing training to stay competitive on the market Page 44
	404-3 Percentage of employees receiving regular performance and career development reviews	Investing in people to grow the Group Page 35
Customer privacy		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 The management approach and its components	Protecting data to protect customers Page 27
	103-3 Evaluation of the management approach	Protecting data to protect customers Page 27
GRI 418: Customer privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	Protecting data to protect customers Page 27
Socio-economic compliance		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 The management approach and its components	Ethics and principles, the architecture of our business Page 22
	103-3 Evaluation of the management approach	Ethics and principles, the architecture of our business Page 22
GRI 419: Socioeconomic Compliance 2016	419-1 Non-compliance with laws and regulations in the social and economic area	During the course of the last three years, Engineering has not incurred any penalties, penal convictions, or sentences requiring it "to do/not to do" something (e.g. prohibitions) due to non compliance with the applicable laws or regulations.

Material topics not associated with GRI aspects		
Management of customer relations and customer satisfaction		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
GRI 103: Management Approach 2016	103-2 Management approach and its components	Quality objective Page 26
	103-3 Evaluation of the management approach	Quality objective Page 26
Research, development and innovation of products and services		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 Management approach and its components	The imperative of innovation Page 18
	103-3 Evaluation of the management approach	The imperative of innovation Page 18
Industrial security of IT systems		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 Management approach and its components	Protecting data to protect customers Page 27
	103-3 Evaluation of the management approach	Protecting data to protect customers Page 27
Social impact of investments, products and services and digital inclusion		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 Management approach and its components	Supporting our communities Page 50
		A more modern society at the service of the citizens Page 68
103-3 Evaluation of the management approach	Supporting our communities Page 50	
		A more modern society at the service of the citizens Page 68

Development of technologies and services for the environment		
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	Materiality analysis Page 123
	103-2 Management approach and its components	A more modern society at the service of the citizens Page 68
	103-3 Evaluation of the management approach	A more modern society at the service of the citizens Page 68

GRI Standard	Indicator / description	Page, references, notes and any omissions
MATERIAL TOPICS		
Other specific non-material indicators		
401-1	Total number of new hires and turnover by age group, gender, and geographical areas	Personnel data Page 130
402-1	Minimum period of notice in the event of corporate restructuring/reorganization for offices and (if included) collective agreements	The minimum period of advance notice in the event of corporate restructuring/reorganization is determined based on the laws of the countries in which the Group operates, and in accordance with the national industry contract and the 1st and 2nd level union agreements.
403-2	Rate of workplace accidents, sickness, lost work days, absenteeism, and total number of deaths, broken down by geographical area	Workplace safety Page 38
414-1	Percentage of new partner suppliers analyzed in terms of labor practices and actions undertaken	Our suppliers: allies in the pursuit of quality Page 29
305-1	Total direct greenhouse gas (GHG) emissions	Respect for the environment Page 62
305-2	Total indirect greenhouse gas (GHG) emissions	Respect for the environment Page 62
307-1	Monetary value of the main monetary and non-monetary penalties for non-compliance with environmental laws or regulations	In the last three years, there have been no environmental incidents or leakages of hazardous substances at the Group's offices and Data Centers that could compromise human health, the soil, vegetation or surface and ground water. In 2017 there were no disputes, fines or penalties due to non-compliance with environmental laws and regulations.

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The illustrations contained in this publication
were made by the children and grandchildren
of the employees who participated in the
“My Selfie” project (see page 40)



See all the images
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