

# Smart Milan

Innovations from  
Expo to Expo (1906–2015)

Mattia Granata

Fondazione  
Politecnico  
di Milano



Springer

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# Foreword

**M**ilan, a city of a thousand hues, multiple possibilities, variable identities. Milan, a city that sometimes appears to sparkle; but more often hides itself. Milan, key player of the Risorgimento, engine of innovation, centre of the economic miracle, capital of business and labour, lynch pin of internationalisation.

There seems to be a common thread among the various possible identities: Milan, the intelligent city, capable of anticipating and carrying out the changes and looking to the future even during the most difficult times. Milan, the intelligent city thanks to its economic fabric, its social relationships, its cultural vitality; but also thanks to its centres of study and research and its institutions of higher education. It is as if, silently, the vitality brought by the tens of thousand of students and the thousands of professors and researchers permeated its fabric and made it sensitive and attentive to the innovations. This openness and search for the new, this speed in absorbing changes, has inevitably made it impressionable and reactive at times of crisis and during the difficult years of its history.

The Politecnico di Milano was created specifically by the desire of a few intellectuals to emphasize intelligence as an economic factor on a par with capital, the workforce, the infrastructures, and, by the awareness of some entrepreneurial groups, to consider technical-scientific education as one of the principal "sources of progress" capable of contributing to the development of the country.

The Politecnico's relationship with the territory, with the manufacturing industry, and with the public administrations is close, pursued with perseverance and attention, also through the initiative of creating structures and centres dedicated to cooperation with the outside world,

among which the establishment of a Foundation together with the businesses and the institutions, was particularly innovative.

And it is precisely from the desire to contribute to development that this work began, while dedicated to Expo 2015, an opportunity to focus attention on a subject of growing significance, to compete in the international arena, and to make the true soul of Milan better known also through its history.

Giovanni Azzone  
*Rector*  
*Politenico di Milano*

Giampio Bracchi  
*President*  
*Fondazione Politecnico di Milano*

## INTRODUCTION

# Milan, History of a Smart City

**S**ant'Ambrogio, patron saint of Milan towards the end of the IV century A.D., was appointed Bishop of the city against his will by acclamation of the Milanese people, and during the time he was in office, among other things, he had several important churches built, including the Romanesque basilica which today houses his remains.

The importance of this saint for Milan is also confirmed by the fact that the city has historically been called "Ambrosian" and that his image is in fact depicted in the banner of the Municipality which is kept in the Hall of Honour of Palazzo Marino, historic seat of the city government.

These facts also indicate that the relationship in Milan between public and religious institutions developed over time in a particular way, through a type of constant dialectic, and remained very secular in the mutual separation of the spheres of influence, which during some periods even formed a powerful element of development in the life of the city.

Sant'Ambrogio Day, 7 December, consequently represents every year a significant moment in Milanese life. The Catholic citizens gather in the churches and in particular in the Basilica of the Saint, where the current successor of the patron saint celebrates his memory. In a less spiritual way, but no less ceremonial, the ruling classes of the city, and the country, traditionally parade in their most elegant clothes in the foyer of the La Scala Theatre where, on the most important social occasion of the year, the opera season opens. Traditionally, in recent decades, it has similarly become a habit that this display of luxury and power be protested in the plaza in front by angry citizens.



Most Milanese, however, at least since the middle of the XIX century, on this day crowd into the traditional markets of the “o bej o bej”, originally located right in front of the Basilica, and in the cold December weather they enjoy a day off and start to buy the first Christmas presents.

This book on Milan should start right from here because of some combinations that cannot be ignored. In fact, on this day, last December during the homily in the Basilica dedicated to the saint, always crowded by the faithful and representatives of the civilian, military and religious institutions, the Archbishop of Milan, pausing to speak of the imminent World Exposition and the role that this could have for the city, in a controversial passage of the speech urged Milan to “find its soul again”.

Since, apparently, this authoritative statement implied a crisis in the city that was not only spiritual, shortly afterwards the Mayor responded stating that “Milan does have a soul, it has many”. Also in light of this dialogue, which renewed the historic dialectic relationship between the civilian and religious institutions of the city, and the underlying comparison of views, a book must unfold on the history of Milan during the period between the 1906 Expo and the upcoming Exposition in mid-2015, which therefore does not intend to ignore the point of arrival of this long path, in other words the Milan of today, our Milan.

These two authoritative views, between those who say that Milan no longer has a soul and who on the contrary maintain that it has many, apparently irreconcilable views, in reality have a common point: in other words that Milan, no matter how good things are, apparently does not have a *single, unanimously shared soul*. This is a starting point, if nothing else, connected in any case to the twenty year old scientific and public debate; namely, when was a centuries-old history interrupted in Milan, as if short-circuited, which opened a long and controversial transition phase, full of lights and shadows which not everyone, obviously, agrees has ended with a secure and safe landing place?

It must be specified that there is no one who does not maintain, with good reason, that Milan has excellent qualities and is, in and of itself, an excellent city. During its history, the city has always been the capital “of something”, with the exception of an administrative capital.

During the nineteenth century, during the period of conflicts with the other nations which led to the Unification of the country, Milan earned the title of capital of the Risorgimento. Afterwards, it became the “moral capital” for its role as leader during the development which it managed to assume vis-a-vis the country, and then the “modern capital”, during the first two decades of the century, as was also obvious

from the impression made on the world during the 1906 Expo. Later the city, after two decades of dictatorship which afflicted the country, earned through the bombing and in the field the title of "Capital of Anti-Fascism", before retaking the lead in the process of economic reconstruction of the country and afterwards driving the *golden age* during the period of the "economic miracle".

The true distinctive trait, which deeply identified the city and its citizens, in any case, the common thread throughout the century running from the first processes of industrialisation to the second half of the nineteenth century on, was as "capital of business and labour". Milan truly built its own self-identity on the presence of the large factories, the entrepreneurs and workers together, albeit in the obvious dialectic of the industrial companies, on the value of work and effort which supported and promoted the economic and civil development of the communities. In Milan, no one would ever have denied in the city of work *par excellence*, "se sta' mai coi man in man" [we never stay idle].

It was therefore perhaps natural that the end of this specific development model of the industrialised companies would also here, as was happening in other world cities, cause a collapse also of identity, a great "disorder", the start of processes of economic and social reorganisation with a result which could not be taken for granted and certainly not guaranteed. This is precisely what happened during the last two decades, after the city had reached its lowest point at the beginning of the Nineties.

The great initial trauma, in fact, did not prevent even during these processes, disagreements, full of light and shadow, that the city would evolve, develop, be renewed even in an amazing way. In fact, in some sectors of the manufacturing and social life, this is precisely what happened. To simplify, it can be stated that the trauma of the end of the "old world" shattered the single identity of the city, which contained and summarised everything, that identified and reassured everyone, and that it fragmented, or rather became a kaleidoscope of many details and changing identities: of localized identities assumed and internalised by individual portions of the city.

Basically, having cracked the shell of the "economic capital", which contained everything, multiple localized identities leaked out which, over the past years, evolved and found their place not only in the city, but in the international excellence in the world. The point lies in understanding whether this breakdown in the processes has reached its maturity, its highest phase, and whether it is now possible, or rather whether there exists within this process the conditions for a synthesis

of this multiform state, in which all of Milan feels welcome. Moreover, it has always been obvious to everyone that it is cohesion that creates strength.

This seems to be at the heart of the recent confrontation between the Mayor and the Archbishop, between the civil and religious authority, between those who see many souls and those who do not see any, rightly (at the spiritual level) searching for a single one.

And it is at this point that the worthy efforts being made within the Municipality to facilitate the safe landing of these phenomena appears to have arrived, supporting them also through a long and reasoned creation of a "Milan brand" which contributes to joining that which has been scattered. Within the context of this process which has involved intellectuals, politicians, and protagonists of the social, economic and public life of the city past and present, analyses have also been carried out which contribute to understanding how the city is perceived both by its citizens, or the city visitors, and by outside observers, in Italy and abroad. As proof of how the ongoing processes have obviously become common opinion, this scientific opinion research produces the perceived image of a city that has become "complex and plural", which, if at the social level it remains welcoming to the extent that it has become a "melting pot", it has become localized without having yet managed to compose itself into a single and unique logic. The end of industrial Milan, but not the "industrious" one, and the now definitively completed transformation of the economic and social fabric, have allowed the city to dominate in various sectors recognised not only by those operating within or near them, but also abroad. Milan has thus confirmed a role, for example, as capital of fashion, design, finance, healthcare, the third sector, university and research, and so forth, without managing yet however, at least obviously, to lead all these aspects back to *ad unum*: hence the many souls, hence the absence of one soul; two views, both true.

But if these processes have reached completion, or are close to the resolution, which now appears in many ways evident, is it then true that Milan has not managed to find an identity or maybe, because everything is happening under our eyes and is still in motion, is it difficult to see the final effect?

To understand what Milan is today, maybe the most representative image is the night-time photograph taken from the NASA satellite which shows the brightest areas of the entire European continent. Milan is the luminous heart of one of the two or three densest areas of

the continent, in a brilliant zone now much wider than just the Lombardy region. This large area represents an exceptional interconnection of tangible and intangible streams, of knowledge, merchandise, people, on infrastructure platforms of transport, and of information which are among the densest in the world and by no coincidence, recently the term macro-region was coined to describe its borders that cross the administrative ones of the twentieth-century institutions, which the President of the Politecnico of Milano was one of the first to use.

Basically, Milan today is this: it has been defined as an "infinite city", in other words that spreads seamlessly over a very vast territory; or a "gateway" of the country towards the world, through which everything passes at the crossroads between Europe, the Mediterranean and Eastern markets; but what is certain is that the old city, progressively crossing its borders, propagating and expanding has spread over a very vast territory of which it has confirmed, and renewed, its role as coordinating epicentre.

That is why, in the "century of the city", this area has found itself again, because of the sum and contribution of many of the characteristics cited, as one of the principal metropolitan players in the world. Not bad for a city without a precise awareness of itself, which a good psychologist would obviously recommend to stop thinking about itself and let itself go, trusting more in its own abilities and in instinct.

It is in light of the current conditions which have emerged from these transformations that Milan in recent years, by following a road opened by many other cities of the world also smaller ones and equipped with fewer resources, has started the process to develop a strategy that would improve the aspects of "smart city". It is realizing, moreover, that over the years and without awareness, it has achieved many results in this context, for example in the field of energy savings, waste management, traffic management and environmental pollution. In this sense, the city and its industries little by little came to life, drawing in the Municipality and the Chamber of Commerce, universities, already active in this field, research centres, multinational and territorial companies, associations, and players of various kinds. The involvement of all these entities made it possible to identify strategies which, in the various contexts, emphasize the initiatives also in relation to the parameters identified internationally in this field.

In relation to the other cities, moreover, Milan has become part of the international circuit and, in Italy, has forged relationships and shared objectives with the most active cities in the sector, in other

words Genoa and Turin. These three cities of Northern Italy have therefore made cooperation agreements by virtue of which those which for decades were the three points of the "industrial triangle" of Northern Italy, have significantly and maybe unconsciously created a sort of "smart triangle".

This concept of a "smart city" in recent years has spread until it has become a type of fashion, an effective brand which, like all effective brands, sometimes risk prevailing over their content. In this case, however, it would be a shame to get tired of the word before having become familiar with it and appreciated its concept, thereby tossing the baby out with the bath water.

Because in effect, given that the involvement which urban density in recent decades acquired in economic and social life worldwide, to the detriment of more traditional institutions which had marked the evolution of the industrial societies and national governments, the concept of smartness cannot be ignored.

This concept, which has spread rather recently, was initially mainly interpreted in the technological sense. From this perspective cities were defined as smart that were equipped or super-equipped with technologies of various kinds, directed at energy savings, efficiency safety, and so forth. This aspect, certainly significant, was however widely influenced by the views of the technologists and, in no less degree, by those of the multinationals of the sector, often interested in selling products on a large scale, or simply not directly capable, because of the prevalent cultures, to develop other less immediate and direct aspects of the concept of smartness.

This last, however, due to the progressive participation of more "humanistic" sensitivities also incorporated requirements other than pure efficiency. Therefore the technology, while remaining an essential aspect, was progressively from end to middle, being interpreted, as it effectively is, as one of the instruments for reaching, for example, better performance in the economic, social, institutional, transport, and environmental fields and quality of life, etc.

In this broader and more realistic sense, the intelligence of a city is considered as its capacity not to be "stupid", in other words, in brief, to know how to transform itself in a balanced manner, both in terms of production, politics and institutions, by adopting the solutions as progress makes them available.

But the solutions that emerge with the passage of time make available, if one considers the concept of smart city in its broadest sense, in

other words not relative just to technological evolution, are the “innovations” that in every context the city can adopt, incorporating them and placing them at the service of the citizens continually modernize. In this way “a smart city connects the past through the present with the future.”

This last statement, probably uttered to reiterate the concept that a smart city designed on the drawing board by adopting all the existing technological solutions does not necessarily produce a liveable city but the realization of an Orwellian dystopia, in reality achieves a more useful purpose, in my opinion, in other words that of “historicizing” the concept of smart city. To reintroduce, that is, not only the factor of time, to some extent already present in the need to plan the smart city for the future, but also in the sense of the past in the evolutionary flow of a city, in its history. By doing so, therefore, one implicitly assumes that the concept of smart city, by its nature progressive because functional to the improvement of the vital contexts such as the communities of people, can also change over time, obviously as the environmental conditions change. A smart city in the twenty first century, which adopts the innovations available today to improve itself and the life of the citizens, is certainly different than a city at the end of the nineteenth century. But if this last was able in turn to adopt all the innovations of the era available, was it maybe not a smart city as well?

Milan today, criss-crossed under its streets by 375,000 km of fibre optics, is certainly a smart city. And wasn't the city which in 1883 was establishing the largest European electric power plant also one? And if “social innovation” today makes it possible to face in a modern way the most deep-rooted social problems, wasn't the first Maria Montessori kindergarten tested by the city welfare associations at the beginning of the twentieth century or, also, the first public housing district of the Umanitaria which provided a dignified life to the less affluent classes, maybe social innovation?

The innovation in the field of design of products and services is certainly an important parameter in a smart city and makes Milan avant-garde because of the state of progress reached today by the cultural innovation in these sectors; cultural innovation which, moreover, made the city avant-garde internationally even in the past, thanks to the constant state of progress were created by these sectors.

In the same way, isn't the emergence noted recently of an exceptional vitality in all the phenomena connected to the so-called “sharing economy”, in the field of production and sharing of public and private

goods and services, which has also found a premature desire for stimulus and accompaniment of these fertile ecosystems by public institutions, maybe an element of proposing again and renewing a traditional innovative role in the constant transformation of the productive fabric?

Beyond the shifting positions in the always debatable international rankings, in which Milan recently demonstrated its vitality, the point is that all the parameters with which one observes the city confirm that

*Earth at night seen  
from the NASA satellite*





the rate of promotion and absorption of the innovations available has always been the true distinctive trait of Milan. It resides in the individual sectors, sometimes even regardless of the painful, indirect consequences that this historically caused, and it exists at the level of the city overall.

And if in the past there was also a constancy, a persistence through the various eras during which Milan was “capital of something”, this was certainly relative to the capacity to welcome, internalize and adopt





the elements of innovation in every setting: from the commercial ones to the social ones, even the spiritual, both positive and negative.

If, therefore, the concept of smart city is a concept that can be historicized and is consequently evolving, Milan is certainly one of the world cities which are "historically" smart cities; and if the capacity to renew itself can be the distinctive trait of a city, Milan has certainly always been a "capital of innovation."

This book attempts to travel through the last century and a half of the history of Milan from this specific point of view: looking backward, and taking a backward path. The goal is not to communicate to the Milanese, but to all those from other parts of the world who will look at this city during Expo 2015, and not recount the history of Milan but some of the salient aspects of its past. A city, in fact, is a complex organism, too complex to be understood, told and explained in a few pages which would perforce be recapitulatory and sometimes simplified.

However, the person who wants to understand what lies behind the Expo, behind the capital of fashion and design, behind the city of business and the stock exchange, behind the shopping and luxury streets, may be able to catch a whisper here of the spirit of Milan.

And someone observing this city, which is always working and always has "its heart in its hand", from a greater distance than the Milanese of today, may be able possibly to contribute to identifying the soul that everyone is looking for, and come and tell us.

M.G. 25 December 2014

# Prologue

## The moral capital

Over a century ago, in 1906, Milan hosted an International Exposition which, over several months, attracted economic firms, representatives of international institutions, Italians and foreign tourists to its attractions. For the first time, it showed the world what development processes were taking place in the country and especially in Milan: a modern city.

The tourists who, without ever having been there before, arrived in the city by train passing through the old Central Station, by their own admission must have had the impression of finding themselves “on the edge of a stormy lake”, overwhelmed by the coming and going of trams, carriages, the first cars, and the stream of people which was in constant motion.

Italy, at the beginning of the twentieth century was still a predominantly agricultural country, in which there were few large scale urban centres and, among these, maybe only Milan had characteristics in common with the other major European cities. Or, at least that is what the Milanese believed and, in fact, that is how the city decided to portray itself in the eyes of those coming to visit the Expo. Not only did the ruling classes and the organizers of the event identify this aspect as the characteristic trait of the city, but the tourist guides of the era, introducing it to the visitors, emphasized the evolution of its metropolitan dynamism: “It does not offer” - they wrote about Milan - “a large number of monuments valued for their art and antiquity: many smaller cities in Italy surpass it from this point of view. But the foreign-

ers coming to Milan can admire the bustle of the streets, the luxury and elegance of the shops, the number and prosperity of the public meeting areas, and the good organisation of certain public services, such as tramways and electric lighting". Moreover, in fact, compared to the art cities such as Venice and Florence, Milan could certainly claim a far smaller quantity and quality of monuments, the legacy of a sumptuous and distant past. Then compared to cities such as Rome, Turin and Naples, the capital of Lombardy, in previous eras might have had less importance at the administrative level, in terms of size or political influence. What is certain is that at the beginning of the century, and the Expo made it obvious, the city had already brought its own role into focus, the result of the processes of a transformation which had taken place in the preceding decades: in 1906, Milan, looking in the mirror, could see the future.

The opportunity to organize an event of the kind, and the capacity to make it successful, was already in and of itself representative of the potential that this city was able to express at that time and the role assumed in relation to the other Italian and international cities.

Compared to the other cities, Milan had already affirmed a specificity that derived from having managed to emphasize its own characteristics and energies. After the construction of the new Italian state, during the second half of the nineteenth century, the major processes of economic and social transformation had visibly concentrated in the northern part of the country, and especially around this urban area more than elsewhere. Here there was a progressive and intense industrialisation on the model of the most advanced European countries. So, at the economic level, the strong industrial development had spread factories and plants everywhere and these had become an integral part of the urban and suburban fabric.

Then the expansion of the new production systems had strongly affected the urban and social transformation. First of all, the economic development had produced a great influx of people from the rural areas of Lombardy, and a concentration of new inhabitants in the Milanese suburbs, contributing to a profound change in the characteristics of the city. This urban redefinition was paired with the emergence of new social classes, such as the industrial working class, and the contradictions that, everywhere in the past, had accompanied the processes of transformation connected with the industrial revolution.

Milan, therefore, in the Italian landscape had become the most sizeable social and political "laboratory" where, along with the positive

features of these phenomena, the more negative and contradictory aspects had also appeared: social conflicts through which new relations were forged within the community. Here, shortly before, during a demonstration in Monza in the summer of 1900, Umberto I, King of Italy, had been killed by a pistol bullet during an anarchistic attack.

And also here, in September 1904, sponsored by the Chamber of Labour of Milan, the first general strike ever in Italy was held, which lasted five days and spread rapidly throughout the country.

On the other hand, fortunately, Milan, in its role as economic and social laboratory, also shone due to its capacity to channel into social and political processes the tensions released by these rapid transformations. It was here that the principal Italian labour union was born, and the greatest development occurred in Italian reformist socialism. At the political and social level, its spread had allowed the working class to become part of public life, feeding social tensions, but also providing a necessary form of representation for the new manufacturing classes, which often achieved control of the major municipalities and were capable of contributing to the modernization of the country.

Straddling the two centuries, not by chance, the major political families and the different cultural trends could be said to have contributed significantly to the civic public administration, which constituted a model of pluralism which made it possible to manage even the most traumatic and controversial processes of economic and social transformation.

In summary, in the landscape of the Italian cities, Milan was able to become the main interpreter of the "new world", concentrating ideas and ideals, artistic expressions, realizations and experiments which characterized the moral and material climate of the beginning of the last century.

So, on these solid foundations, Milan had built the well-proportioned ambition of regaining a strong international dimension which had always been part of the tradition of the city. This occurred in connection with the development of the manufacturing industry, which had attracted important foreign investors interested in the capacity of the market and the manufacturing conditions; but also on the cultural level, since at the beginning of the century artistic and intellectual groups flourished, which, in harmony with the European cultural climate of the period, played a primary role in the renewal of Italian culture.

The Milan International Exposition of 1906, consequently, had to serve as a showcase for all these changes and developments and, at the same time, strongly confirm and reiterate the city's role as leader of the country and its capacity, or at least its ambition, to get involved and possibly place itself on a par with the major capitals of the most advanced Western nations.

Naturally, the Italy of 1906, and Milan in particular, had no doubt changed compared to those of the previous decades and radically compared to 1861, when the Unification of Italy had its founding moment.

At the time of the Unification, in fact, Milan had just under 200,000 inhabitants and, among the large Italian urban centres, it ranked after Naples with 440,000, Rome with 244,000 and before Turin, Genoa and Bologna. The boundaries at the time were marked by the so-called "walls" of the Spanish period which encircled the city centre like a rink, composed at the time of about 832 hectares. The territory surrounding this area was completely independent at the administrative level and formed the municipality of the "Corpi Santi (Holy Bodies)" eight times larger than the other (6382 hectares), composed of small villages closely connected to the capital but also competing with it. At the time, about 50,000 people lived in this neighbouring territory.

Around the middle of the XIX century, the plan of the city was rather simple. The city centre was enclosed by the circle of waterways, a series of navigable canals crossed by bridges which, while several of the old waterways had already been covered over, made Milan look like a city of water and were used to move merchandise and equipment. Routes traversed this tight circumference, in turn, like spokes connecting the city with the surrounding territory. Each of the main city boulevards branched out in the various directions starting from the centre, and passed through the ten gates called Tenaglia, Comasina, Nuova, Orientale, Tosa, Romana, Vigentina,



Ludovica, Ticinese, Vercellina. These gates still exist today, albeit with different names, and split the Spanish city walls.

Obviously, the economic heart of city life in that period was in the centre, within the canals, where in a very small area there were buildings, residences, places of work, production and trade. Later, during the incessant process of development of the city, while commercial and productive activities connected to urban life remained in the centre, larger factories and warehouses progressively moved into suburbia, outside the walls.

*Milan, trams circulation in Piazza del Duomo and adjacent streets, early 1900's (Civico Archivio Fotografico, Milano)*



It was at this time, around the middle of the century, that the businesses could also start to rely on a railway system which made it possible to connect to the major lines of transport towards Venice to the east, Turin to the west, and Piacenza to the south. These lines left from the Central Station, which had been inaugurated in 1864 and was located in the northern section of the city, at that time next to the walls connecting Porta Venezia and Porta Nuova.

The area immediately outside the urban setting was varied and not homogeneous. The northern area, in fact, which from Milan extended towards the lakes, was one of the earliest industrialised areas of the entire Lombardy region made up of small urban areas but which gathered, and later would beckon, population flow and economic activities. Still outside the city, but in the southern area, conversely, due to the characteristics of the territory, the settlements were more widely spaced, and the presence of farmsteads and later agricultural companies was widespread, as well as smaller urban centres which in history had become places for trade and commerce. This entire area which descended towards the Po plain was historically distinguished for its great fertility and a specialisation in agricultural and agribusiness activities, a characteristic maintained virtually up to the present day.

The City of Milan and its surrounding areas, in any case, were complementary and interconnected both in terms of flow of people, who daily poured into the capital to go to work while living in the outer areas, where the cost of living was lower, and in terms of the flow of merchandise and economic activities.

These characteristics, in other words the division between city and the territory, and the differences in specialisation between the North and the South, remained constant even during the subsequent development of the Milanese urban area.

This initial snapshot, all things considered, certainly described a city not too different from what it could have been during previous periods, and represented a situation which after the Unification and in a rather short period of time, was destined to change radically.

In particular, it was during the period between 1871 and the first decade of the next century that, after the expansion by decree of the city borders, there was an intense growth in the population which, in the span of about thirty years, took the number of residents of Milan and the neighbouring municipalities to over 400,000.

In fact, during this period there was a real "demographic fever" which saturated the centre within the walls and then, progressively,

overflowed into the outer area and towards the periphery, in particular the northern suburbs, where in the meantime the industrial facilities had started to become denser and the network of urban and suburban public transportation was developing.

## The pioneers of Milanese industry

The size Milan, around the middle of the XIX century was therefore comparable to that of other Italian cities, but during the period following the Unification of the country, changes took place which led the city to taking a leading role in the Italian landscape. A series of conditions were concentrated here that made it possible for the ongoing economic and social processes to find an environment that was particularly fertile for generating the benefits of the modernization.

One of these first conditions was certainly a characteristic openness of the city. During the nineteenth century, a type of myth spread that the city was a place of opportunities, where foreigners willing to take a challenge and a risk, if brimming with ideas, initiative and desire to work, could invest their resources and, by gambling, possibly emerge winners. Milan was a “bourgeois” city and, therefore, the values of economic initiative, work and social mobility were certainly widely shared.

Another significant aspect in promoting this development of Milan was obviously due to the presence in the city of personalities capable of interpreting the spirit of the times and to acting on transforming the situation around them, while spreading ideas and innovative practices. One of these central personalities in the life of the city in the second half of the nineteenth century, who is entitled to a place of honour, is certainly Giuseppe Colombo. He was born in 1836 to a lower middle class family of the city and graduated very young from the ancient and prestigious University of Pavia, where wealthy youth of the capital studied at the time. While he was there, he was the favourite student of Francesco Brioschi, Dean of the University as well as both an important mathematician and politician, and afterwards he became Professor of Industrial Mechanics and Machine Design at the Society for the Encouragement of the Arts and Crafts of Milan. In addition to having participated in the nationalist wars, fighting with the troops of Garibaldi, Colombo was in particular an important entrepreneur who had the capacity, before anyone else, to under-



stand the importance of electricity and to find the way to introduce it to Italy thus contributing to the birth of the Italian electric industry.

At the time of the “International Exposition of Electricity” held in Paris in 1881, in fact, he obtained from the company founded by Thomas Alva Edison the exclusive Italian license for the system being promoted. The following year, he visited the founder of that company, participating in New York in the inauguration of the first electric build in Milan a large plant to produce electricity. It was based on this that, on 28 June 1883, in via Santa Radegonda near the Cathedral, the first electric power plant of continental Europe was inaugurated.

The real turning point, the christening of electricity in the city, however was realized a few months later when on the evening of Saint Stephen in 1883, during the opening evening of the La Scala opera season, thanks to the new power plant, the majestic chandelier hanging in the centre of the Theatre, the symbol of the city, lit up for the first time.

*Edizioni Broggi, Milan, Duomo, Santa Radegonda,  
first power plant of Continental Europe, with view, 1882-1890  
(Civico Archivio Fotografico, Milano)*



The lighting of 2,450 electric bulbs before the eyes of the entire well-to-do class of Milan gathered in their festive finery for the most elegant event of the year, finally gave the symbolic depiction of what modernity could produce, to the extent that the newspapers of the day described the enthusiasm and the wonder that this light display had produced: "the success of La Scala has given us more confidence" - wrote Colombo later; adding as proof of the speed with which progress was pressing - "and now we are quickly wiring at least 100 more lamps".

Soon afterwards, in fact, the power station of Milan started to produce "hydroelectric power", in other words the energy to light the city centre, the first tram network encircling the Cathedral and the nearby manufacturing activities. Thus the first electric plants started to become widespread.

Spurred on by these successes, in addition to becoming in the following years the Chairman of the Edison Electric Company, which assumed the task of promoting the development of the Lombard electrical system, the liberal Colombo also continued a successful political career which took him from the Town Council of Milan to the National Parliament and important positions in the conservative governments in office in Rome between the nineteenth and twentieth centuries.

In addition to his entrepreneurial and political activity, however, Colombo's real passion was in the field of research and education. Colombo, for example, ran for a long time the journal "L'Industriale" and wrote, then around the end of the Seventies, the first Manual of the Engineer, published by Hoepli, a cultural reference point for the middle class of the city during that period. But, especially, his commitment was devoted to educating directly at least one generation of the city and national management class.

Starting in 1865 and for decades, he was in fact the chair of Mechanics and Industrial Engineering of the Technical College of Milan, the school of higher education that would then become the Politecnico di Milano.

In fact, it was with the competition at the foundation of this important Milan institution that his activity made it possible to achieve an additional indirect factor of modernisation for the city, in other words the early existence of a university capable of supporting the ongoing general manufacturing transformation, by conveying information, knowledge and values capable of accompanying the processes then under development.

The oldest university of Milan, Il Politecnico, was in fact founded in the aftermath of the Unification of the country, in 1863, through the impetus of the Society for Encouragement of Arts and Crafts with the