

The logo for the G-20Y Summit, featuring the text "G-20Y" in a large, bold, black sans-serif font, with "Summit" in a smaller, red sans-serif font directly below it. The background of the entire page is a light gray with a white dotted pattern that forms a world map.

G-20Y
Summit

We design **our world**



G-20Y Summit 2020

Final Perspectives

7-11 October 2020
Evian, France

www.g20ys.org

There are a few places in the world where the future is being built.

The G-20^Y Summit is one of them.

We design our world

ABOUT G-20Y ASSOCIATION AND G-20Y SUMMITS

The 11th G-20Y Summit took place in Evian, France from October 7 to 11, 2020.

The G-20Y Association is an inspiring, independent and innovative platform for a new generation of business leaders addressing the biggest challenges of our times to shape a better future.

The G-20Y Association organizes G-20Y Summit each year to bring together a select group of executives from 20 of the major economies worldwide to engage in meaningful dialogue and co-creation, building a strong network of executives across industries and geographies.

In 2020, the G-20Y Summit overarching theme was dedicated to: Redefining Success For People, Planet and Profit with the focus on New Normal in Post Covid World and how business can win the fight and transform to win the future.

We are at a time where all businesses across all sectors, and even all individuals, have been going through a transformation process. Among other things, this requires the transformation of business activities/functions; business processes; business models; business ecosystems; business asset management; organisational culture; ecosystem and partnership models; and customer, worker and partner approaches.

Together we tried to find solutions on how business leaders should react and run the corporations in a challenging times of COVID-19 outbreak and economic instability.

Each G-20Y Summit delegate joined the work of one of the Summit's Committees to co-create actionable insights implementable for businesses on upskilling initiatives and on how to redefine business activities to improve operating effectiveness, to stay competitive and meet customer expectations.

During the G-20Y Summit, the executives participated in meaningful discussions and exchange of best practises in different committees and subsequently develop their perspectives:

1. The Future of Jobs;
2. Joint sessions of the Future of Banking - Beyond Financial Services & Innovative Insurance and InsurTech;
3. Joint sessions of the RE-thinking Energy Markets & The Smart Cities and Innovative Technologies.

The companies that have participated at G-20Y Summits from 2010 to 2020 are: HSBC Holdings, MasterCard, Statoil, Société Generale Group, PepsiCo, Credit Suisse, McKinsey, London Stock Exchange Group, Marriott, ORIX Corporation, FedEx, KPMG, Nestle, ING Group, Eni, Rolls-Royce, Insurance Australia Group, Generali Group, Prudential Financial, Total, Intesa Sanpaolo, Airbus, Standard Bank Group, E.ON, Bosch, Bayer AG, EDF, Zurich Insurance Group, PwC, Lufthansa, Enel, Philips, Microsoft, Uber, Deutsche Bank AG, Royal DSM, Swiss Re, Unilever, Munich Re, Lafarge, Nordea Bank, Daimler, GDF Suez, Hellenic Petroleum, PPC, Infineon Technologies, Siemens, Sabic, Aflac, Schneider Electric, Danone, SAP, Bank of America, ATOS, BT Group, Amal Alliance and more. The list of participants also includes senior official representatives of national and regional governmental organisations.

G-20Y SUMMIT FINAL PERSPECTIVES 2020

We, the individuals in corporate executive leadership positions of the world leading companies, gathered for the 11th meeting of the G-20Y Summit on October 7-11, 2020, with an overall view to strengthen international cooperation between business and financial leaders and to find innovative ideas towards sustainable prosperity on a mid- to long-term perspective. As a result of three days and 4 formal sessions of discussions, we have assembled a set of perspectives on the following topics on the G-20Y agenda, namely:

- I. The Future of Jobs;
- II. The Future of Banking - Beyond Financial Services & Innovative Insurance and InsurTech;
- III. RE-thinking Energy Markets & The Smart Cities and Innovative Technologies.

The G-20Y business community adds value and contributes by raising fresh thinking and capturing the attention of the relevant leaders to identified questions in order to inspire them to create a better future.

DISCLAIMER: THE PRESENT PERSPECTIVES ONLY REFLECT THE VIEWS AND RECOMMENDATIONS OF THE G-20Y SUMMIT PARTICIPANTS THEMSELVES, NOT THOSE OF THEIR COMPANIES OR EMPLOYERS.

THE VIEWS AND PERSPECTIVES ON THE TOPICS ARE THOSE OF THE COMMITTEES WORKING ON EACH OF THESE TOPICS. THEY DO NOT NECESSARILY REFLECT THE POSITION OF ALL OF THE G-20Y SUMMIT PARTICIPANTS.

G-20Y SUMMIT 2020

THE FUTURE OF JOBS - FINAL PERSPECTIVES

“What Covid has done is to apply an extraordinary and unusually powerful microscope to worldwide governance. And much of what we see through that lens of the microscope is not pretty.” — Cardinal Michael Czerny

NEW NORMAL

COVID-19 is not a temporary affliction, but rather an involuntary transition. While initial responses gravitated more towards survival to return to a pre-covid state, it is now evident that we must embrace the opportunities to transform and transition to a New Normal in both the working environment and education.

The year 2020 has undoubtedly become a turning point, and we have yet to fully understand the real cost of this pandemic from both a health and economical perspective. There is basically no sector or aspect of our life that has not been impacted, and the working life does not make an exception. In February, the coronavirus struck the world economy with the biggest shock since the second world war. Lockdowns and slump in consumer spending led to a labour-market implosion in which the equivalent of nearly 500 million full-time equivalent jobs disappeared almost overnight.¹

We have moved from an “offline” world to a hybrid model, which consists of a big number of tasks that previously could not be seen as being performed remotely, and now demand the renegotiation of a new social and family contract. With work-personal boundaries blurring, we are pushed to rethink the dimension of trust.

We unexpectedly experienced many people visiting our home – through the camera providing the essence of our house.

The pandemic has also influenced how people think about leadership, forcing us to question what it means to be a good leader. Effective leaders might not hold the top position in a powerful organization, but be the person who helps the largest variety and number of people to contribute constructively to solutions.

NEW NORMAL IN JOBS

The world of jobs has embarked on an ambitious and unprecedented experience, testing the efficaciousness of working from home. Thus far, we have learned organizations can reduce premises and facilities costs while increasing employer branding and accessing wider and distributed pools of talents. Employees can save time and costs by avoiding commuting, and also improve their work-life balance with the increased flexibility. The access to distributed talent pools will become a key competitive advantage for both employees and companies that are technology and culturally remote-ready.

Society as a whole can also benefit from improved sustainability, with lower CO2 emissions, energy savings and paper-use reduction. The concept of taking care of our planet has now become a staple within our lives and organizations.

It seems from the results of our experience, that remote work will likely remain in place as a structural way of working, since it brings advantages for all stakeholders involved. Despite the sudden shift to remote work with little-to-no preparation, recent employees’ surveys have shown that productivity has

¹ [ILO Report](#)

predominantly stayed at the same level or even improved.² **However, productivity improvements cannot come at the cost of employees' wellbeing.**

Employers must now pay extra attention to take care of employees' mental and physical well-being, safeguarding the separation between personal and professional time and affirming the "right to disconnect." Individuals must know that they can and should disengage to sustain a work life balance and improve mental health. While technology has certainly facilitated collaborative work and enhanced communication, it has added new stressors and created the unrealistic expectation of constant accessibility. To this effect, a survey published in 2020 found that 44% reported feeling burnout symptoms.³ Stress creates mistrust in institutions. Thus, it is our social responsibility as good leaders and humans to question how we can best support the total well-being of our teammates in both their personal and professional lives, especially now that boundaries are blurred.

NEW NORMAL IN EDUCATION

The Future of Jobs is tied to the Future of Education, specifically how to respond to the disruption in education that the COVID-19 pandemic has produced. The crisis has forced us to examine education systems around the world, and adopt new models of learning and innovation beyond the classroom. Education in this sense is not specifically early childhood development, schools, and universities, but rather the ongoing "learn-work-life balance".

The COVID-19 crisis is a signal that school systems around the world need to move beyond existing approaches to embrace more radical innovation, rethinking some fundamental elements of how we have educated students for generations. Education systems now have an opportunity to reimagine the school systems that were forged in the 18th century. The challenge isn't just to adopt new technologies, but also to incorporate them in ways that improve access and quality.

In the digital era, educators need to expand their understanding of what it means to be literate in the 21st century: not replacing traditional learning, but complementing it. Computer programming and digital literacy are becoming core skills. For example, England has integrated computer science into all levels of primary and secondary education, so students start learning about coding and internet safety from the age of five.

In a time where companies are increasingly looking to prepare their employees for the future, it's important to know what skills and competencies the workforce currently possesses. The exchange of information would help the educators to complement its traditional learning, equipping its alumni with critical skills.

There is a disconnect between the skills individuals are taught and those that employers are seeking in new hires with 96% of universities believe they produce employable people while only 11% of employers believe universities produce employable people.⁴ Shockingly, 80% of employees don't believe they have the skills to do their job.⁵

Given the rate of industry change, the skills gap is growing every year unless people continue actively learning new skills and technologies. This is where lifelong learning, eternal learning, or 'cradle to grave' education plays an important role. A number of countries are setting in motion new ambitious agendas to support the upskilling and reskilling of the adult population, showing a strong convergence

² [BCG Report](#)

³ [Employee Burnout Survey](#)

⁴ [US Chamber Foundation](#)

⁵ [Gartner Report](#)

between national policy agendas, and the objectives pursued by Upskilling Pathways. These include new initiatives in France, Germany, Ireland, Nordic countries, and the Baltic countries.⁶

There is an increased need for soft and social and emotional skills, including creativity, problem-solving, and critical-thinking skills to be ready for the future's fastest growing job segments.⁷ A mastery of social emotional skills are required not just for better learning outcomes, but also for improved outcomes related to life, health, and well-being.

CALL TO ACTION: CORPORATIONS, GOVERNMENTS, EDUCATIONAL INSTITUTIONS, COMMUNITIES, & INDIVIDUALS

This pandemic has given us the opportunity to reimagine the world around us and prioritize the following solutions for a better future:

- 1) Establish faster decision-making mechanisms to expedite innovative solutions;
- 2) Subscribe to the notion of Mental Sanitation, the concept of being responsible for the wellbeing of the whole person to produce optimal health. This is not just a corporate responsibility, but also a call to governments to produce state level programs to mitigate long term ramifications;
- 3) Champion the internet as a common good and increase accessibility to technology at full quality and fair price across the globe;
- 4) Improve both internal and cross-sectoral communication and coordination, creating an accountability model where workers can identify their needs and seek out resources to build their capabilities;
- 5) Perpetuate the positive and neighborly relations that have emerged.

Corporations and academic institutions need to work together to produce learning outcomes that are conducive to employability. The establishment of think tanks would foster cross-sectoral coordination through strategic dialogue across multiple stakeholders. Individuals can review training that provides the necessary skills to succeed in the workforce. [Take for example the new Google Certificate, where instead of a traditional university diploma, individuals can attend a three to six month program that would facilitate career placement with a competitive salary.]⁸

CONCLUSION:

Historically institutions have employed a “customer centric” approach. Yet, a clear takeaway of this pandemic has been the need for a “human centered” approach. This approach should take into consideration the human aspects of both employees and customers, such as wellbeing, human touch, and fear.

Our success in transitioning from pre-covid to the New Normal depends on our ability to support the whole-person approach, focusing on the well-being both inside and outside of the work environment.

⁶ [European Commission](#)

⁷ [McKinsey & Microsoft Report](#)

⁸ [Google Certificate](#)

G-20Y SUMMIT 2020

JOINT SESSIONS OF THE FUTURE OF BANKING - BEYOND FINANCIAL SERVICES & INNOVATIVE INSURANCE AND INSURTECH - FINAL PERSPECTIVES

A) CURRENT CHALLENGES FOR THE FINANCIAL INDUSTRY

*“Banking is necessary, banks are not.”
-Bill Gates*

In the aftermath of the financial crisis which threatened the very essence of the banking and financial sector, the industry is faced with a new set of unprecedented market challenges, overlaying geopolitical and technological trends with a pandemic that has touched every part of the global economy and society itself. Recent developments such as the US - Chinese trade war, increasing nationalism, as well as longstanding trends such as demographic shifts are changing the world as we have known it for decades, and are doing this at an unseen pace.

In addition, the financial sector has been involved for years in a digital transformation that has impacted service models, methods of relating with customers, the physical structure of branches, staff skills, communication styles and investment priorities. Pathways to de-materialization, mobile financial services, multi-channels in the provision and sale of services, and business intelligence are just some of the areas where technological innovation has triggered changes in established models. With the rise of the digital revolution, customers' needs, habits and expectations have changed; new and untraditional competitors have entered the market, offering a better user experience as well as innovative services and lower costs.

With that, the sources of revenue and profit are changing, cost pressure is mounting, customer behaviors are evolving, and regulators are subjecting the industry to increasing levels of disclosure and compliance. Therefore, business models (the way we act and the way we operate) must change. In the near future, customers will expect financial institutions to design products that dynamically adapt to their fast-changing circumstances and addresses their needs; they will expect to be always individually addressed or have the possibility of creating their own profile.

Furthermore, the recent pandemic has revealed the urgency for change in culture, posture, and approach and has acted as an accelerator of necessary changes that had begun in recent years. It has been a disruptor, unveiling weaknesses and gaps as well as strength and opportunities. We cannot expect to return to the normal as we knew it. In order to stay competitive and relevant in the current crisis as well as prepare for the next normal, we will need to adapt fast and with determination and anticipate and lean into the changes we see in the future.

Consequently, financial institutions have to re-think their strategies to successfully position in the new normal and substantially change their processes given the challenges they need to address.

From our perspective, there are two main drivers that will shape the strategic agenda and lead to substantial change within society, the economy and each organization in the financial industry: (i) the digital transformation at the core of the technological advancements we are experiencing and (ii) the rise and prominence of environmental, social and governance (ESG) in corporate practice.

The pandemic reinforced the relevance of these factors, as technology proved a critical tool for businesses and society as a whole to adapt in the wake of a complete shutdown. The rapid and widespread adoption of these technologies cannot easily be reversed and will likely have long term impacts on the way businesses will operate in the future. Conversely the crisis also raise the further awareness of key ESG issues such as social inequality, which was further exacerbated during a crisis.

Looking to the future, the COVID crisis also provided a wake-up call of the catastrophic scenarios that could unfold in the wake of inaction around climate change.

B) HOW TO TURN THE REQUIRED CHANGE PROCESS INTO AN OPPORTUNITY WHEN DEVELOPING FROM TODAY'S BUSINESS MODEL TO THE TARGET MODEL OF THE FUTURE

ESG and digitalization require financial institutions not only to overcome their traditional approach and adapt their businesses but also to reinvent their entire business model.

The development of technology captures all parts of the financial industry's value chain and goes beyond revising and automating current processes. It creates entirely new landscapes and ways to operate and interact with clients, regulators and other stakeholders. The use of new technological means such as big data, artificial intelligence and quantum computing allow for greater client insights, better customer experience, efficient back-office processes, more accurate pricing of risk, and new products and services.

The rapid change in the digital landscape has also resulted in a change of the competitive landscape, where traditional financial services providers are facing threats from new entrants. Financial technology companies, which had emerged largely niche players have stepped into a larger role of disrupting and disintermediating the banking system. Additionally, BigTech companies are expanding into the financial services arena, putting further pressure on traditional providers to make significant investments in order to deliver a strong digital client offering.

Similarly to the technological change, the sustainability has emerged as one of the most important benchmarks to operate in the future and therefore will affect the way we operate across the financial industry. In order to meet the growing demand, risk framework changes, and changing regulatory landscaping driven by ESG, there will be a need to assess the implications across the financial industry's value chain such as in the underwriting process, client interactions, risk management, and the development of back-office and infrastructure support.

Therefore a cohesive approach will be important to ensure that people and systems are considered in the integration of ESG across a business.

There are few key aspects along the financial industry's value chain elements that can mitigate the negative effects of those ongoing changes and turn them into an opportunity to create a winning business model for the future.

Certainly, implementing a new business model requires significant investments that might not be available for every market participant, which will lead to strict prioritization and aggressive resources reallocation, resulting in potential structural changes in the market. These developments will require addressing the social impact that comes with such change. The sooner the change comes, the bigger its impact on people and society. Hence, there is no time to lose finding robust models to deal with the impact of such change processes.

EVOLVING RELATIONSHIP WITH CUSTOMERS

Customer demand will basically drive which business model will be successful in the future. Customers will expect to receive tailored and personalized products and services, designed to constantly adapt to their fast-changing circumstances and needs. To successfully respond to the customers' demands, the financial industry has to change the way it operates: become more agile, re-shape of the strategic priorities, redesign products, and re-engineer of internal processes, to name a few.

With these pre-requisites in mind the industry can focus on:

- Making the shift from pure product provider to solution provider with high quality experts skilled to work in a "new normal";

- Becoming an Open Banking (banks) and a trusted long term partner (insurance), where customers can find a range of products and services, not limited only to banking and insurance sector but including those added value services that strong partnership network can provide;
- Guiding the customers on how to address ESG and sustainability in their business models and supporting the growing demand of sustainable products;
- Offering of personalized products and services for customers and prospects, leveraging on data and analytics;
- Re-thinking new brand loyalty drivers;
- Enhancing the risk management approaches by fully capturing the opportunities offered by the new technologies;
- Implementing new perspectives to look at risk integrating the ESG criteria;
- Accelerating cash-less society development, utilizing new technologies and building the required infrastructure.

DISRUPTIVE TECHNOLOGIES

- Accelerate digital transformation, adopt new development methodologies as agile and scale-up to significantly reduce time-to-market and increase productivity;
- Transition from legacy systems, introduce end-to-end fully digitalized processes where human interaction is not required and move the people to added value activities;
- Cloud computing, AI, Biometrics and virtual assistance to reduce cost, improve the efficiency and improve customer satisfaction;
- Use of technology to increase efficiency, become more eco-friendly and demonstrate the institution's social and environmental responsibility;
- New technology allows to expand to new client target groups (e.g rural areas, underprivileged communities, younger demographics, etc.) in a cost efficient way and thereby increasing 'financial inclusion'.

CHANGE the BUSINESS MODEL

- Introduce a client-centric approach;
- Improve—customer experience—by simplifying processes, increased personalization and convenience;
- Set industry standards, build utilities and outsource non-core activity (e.g. KYC) to focus more on value add services;
- Build products and services aligned with the customer journey of the day and next future;
- Increase focus on R&D and create new competitive service offerings and products, rationalize business lines, improve operational efficiency;
- Consider changing customer demographics to develop differentiated products/services and customer experiences, thereby tap into new client segments;
- Seamless omni channel experience vs. human interactions only;
- Redefine KPIs to steer the businesses reflecting the sustainability and inclusion aspect which is expected to become one of the main aspects that defines the licence to stay in business.

COPE WITH INCREASING AND CHANGING COMPETITION (e.g. Bigtech and Fintech)

- Disruptors such as Fintech players, BigTech and non-regulated market participants entering the arena, changing the “rules of the game” creating new market standard for which incumbents are forced to comply;
- Re-defining its own strategy and re-focussing on its own core USPs may be a winning strategy for incumbents when traditional value chains are being disintegrated;
- New ecosystems are emerging opening up new opportunities if those ecosystems are linked to the own strengths/assets;
- New emerging competitors from non-financial industries are disintermediating the incumbent from the ultimate customers and, in the process, are retaining a part of the value, however, new partnership structures and ways to collaborate with different players may help financial

institutions broaden the product and services offer to customers, amplifying the network effect and achieving cost efficiency;

- New fee and remuneration models need to be developed that work in the world of a disintermediated value chain.

REGULATORY/COMPLIANCE PRESSURE

- Regulators and governments are advocating for increasing controls, transparency and even harsher penalties for companies that do not comply to market standard, RegTech, the use of technology such as AI and the harmonisation and integration of systems may help to reduce the failure rate of controls and decrease operating costs;
- Technology often create new “compliance needs” like IT security that is becoming increasingly important and generating significant capex investment and absorbing a lot of management focus and at the same time improves the security and control standards;
- Needs to create a compliance culture around many topics (privacy, cyber, anti-terrorism, financial crime, e.g.) and Implement compliance structures and systems.

C) CONCLUSION

The Covid-19 pandemic has been a wake-up call, and financial institutions should now take the chance to speed up the structural change that has already begun in recent years. Focusing on the right topics and developing a clear strategy that is able to sustain the high costs required by such a structural revolution are key priorities.

Legacy businesses cannot be adjusted smoothly, though. The change will be disruptive and will likely be deployed in a relatively short period. Therefore, it is of utmost importance that the transformation is developed from inside the system, involving the workforce and fostering the cultural change. However, the impact of the change should be managed properly and potentially mitigated in order to maintain stable political and social system.

In all the anticipated changes, human needs have to become the cornerstone for defining the success of the transformation. Human capital is the key resource to impact the business models, so the effectiveness of any strategy is contingent on prioritizing investment into up-skilling and educating the workforce. Such a strategy will also help to attract and retain talents with new required profiles that are important for the successful transformation process.

Therefore, life-long learning and re-tooling will be necessary for the employees to keep the pace with ongoing developments required by new technologies which also help them to remain relevant in the world of “new normal” and be successful in the changing environment of the next future.

G-20Y SUMMIT 2020

RE-THINKING ENERGY MARKETS & THE SMART CITIES AND INNOVATIVE TECHNOLOGIES

THE PATHWAY TO SMART CITY

More than half of the world's population lives in cities, and one in eight urbanites reside in one of the 33 "megacities" with more than 10 million inhabitants. While urbanization creates challenges that threaten the quality of life, it also represents our best hope of solving these challenges; dense cities provide the testbeds needed to gauge the effectiveness of related solutions. Never have cities been tested as they have by the COVID-19 pandemic, which unfolded in early 2020 with unprecedented rapidity and severity.

Clearly, only through the collective efforts of governments, the private sector, non-governmental organizations, and the public, through the harnessing of transformative technologies and enlightened policies, will we be able to protect and realize the true potential of cities.

RETHINKING THE SMART CITY OF THE FUTURE

Smart cities today are increasingly the reference concept in the context of urban planning, regional economic development, community building, infrastructure development. The term is used in a wide variety of contexts, but the underlying concept is dynamically evolving every day acquiring new meanings and perspectives. The combination of all such factors make defining a smart city difficult, but some of their defining characteristics in terms of their purposes can help:

Enhancing the quality of life - Economies of scale drive urbanization but quality of life in cities is / has worsened. Smart cities are here to change this trend and to create improvements in access to resources / services but also in social interaction and cohesion.

Improving sustainability - Smart cities aim to create a sustainable environment from a 360° perspective, reaching from people, companies, institutions to resources, infrastructure, climate.

Providing key enablers – Smart city elements and technologies aim at empowering citizens and enabling them to:

- A sustainable development;
- An improved quality of life;
- A better and more efficient use of resources;
- An active role of citizens.

Mapping also the key dimensions of a Smart City may be difficult. As the concept and purposes of a smart city evolve dynamically adapting to fast moving contexts, also its dimensions vary. However, as the concept has emerged, some key dimensions of Smart Cities have emerged and include:

1. **Environment**
 - a. air quality (electric heating/cooling and transport);
 - b. access to clean water (efficient use, infrastructure, management of integrated water cycle);
 - c. sports / leisure (intelligent use of infrastructure spreading peak loads).
2. **Safety & Security of citizens**
 - a. Crime control (surveillance of public spaces, smart lighting);
 - b. Reduction of accidents (smart lighting, smart signalling);
 - c. Infrastructure resilience.
3. **Mobility**
 - a. Electric vehicles (recharging infrastructure);

- b. Traffic control;
- c. Modal switch (sharing, increased usage of assets);
- d. Alternative transport (e-bicycles, e-skates, etc).
- 4. **Sustainable electricity supply**
 - a. Deployment of renewable sources, green energy procurement (emission reduction, better use of public spaces);
 - b. Smart grids (resilience, reliability).
- 5. **Affordable housing**
 - a. Liquidity of rental market (better access to transport, revaluing certain city areas);
 - b. Access to credit;
 - c. Creating inclusion / avoiding polarization.
- 6. **Good governance**
 - a. Inclusion;
 - b. Transparency;
 - c. Participation.

Having in mind the key dimensions of a smart city, smart urban development based on a shared vision should be directed according to specific smart city targets and metrics articulated on the short, medium and long term and related to:

1. **Environmental parameters** - such as water and energy consumption levels, CO2 emissions and local pollution, reduction in the amount of urban waste or factors that affect the community as a whole;
2. **Social parameters** - such as access to information and education, health facilities, culture and leisure activities, inclusion in decision-making processes;
3. **Economic parameters** - such as obtaining new funding sources, setting up new projects or defining new forms of cooperation.

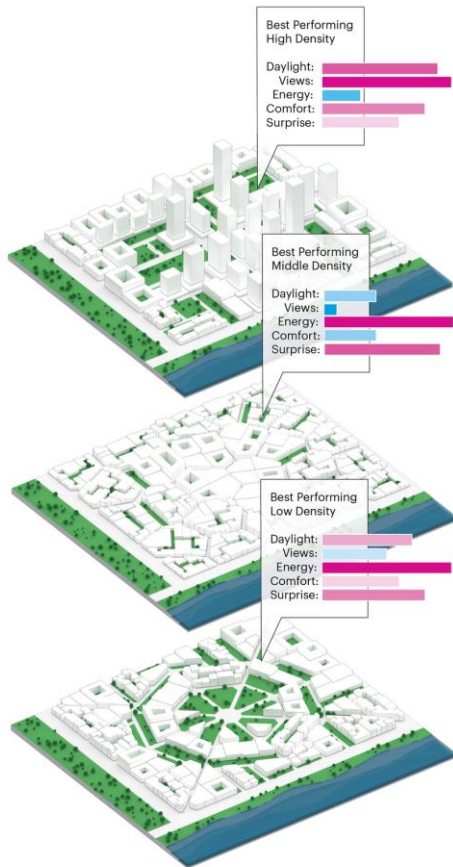
While the above metrics focus on the purposes of a smart city, they should be integrated with another set measuring the necessary deployment the tools to fulfil such purposes. Such tools tend to be technological and relate to the adoption of new technologies and their level of integration within city activities.

DESIGNING THE IDEAL SMART CITY

The Smart City concept represents an opportunity to consider both the future of cities, and the future of how cities are designed. Large-scale master planning takes months or even years to create an ideal design that satisfies multiple parties, often struggling to adapt to the demands of ambitious urban projects. With this bottleneck in mind, mindful city designs should be developed before building any urban, suburban and rural infrastructure that affect layout and distribution of technology advanced and connected cities. Such designs are the result of data science and machine learning workflows, and engagement of multiple stakeholders to solicit feedback from a broader audience. This approach allows a cross-disciplinary team to quickly prototype high performing scenarios capable of addressing the complexities of the smart cities of the 21st century.

Digital Twin

Digital Twin has emerged as a technology to simulate implementation of architecture and landscape before construction can commence. This technology represents the next step in the evolution of complex information presentation. For cities to be more resilient, they should consider the power that virtual twin simulations offer to see and ultimately transform the future. “What if” scenario planning can be a key difference in readiness levels; using virtual and augmented reality to enable robust “what if” planning makes it possible to see multiple potential futures, test their consequences and implications, and then work to build the best possible city layouts.



KPF Urban Interface

Source: <https://jdanforth.com/>

Rather than introducing new technology onto traditional urban design without proper planning, a Smart City privileges performance over form, and merges the concerns of human experience (comfort, daylight, visual interest) with functional efficiency: sustainability, building efficiency, access to transit and green spaces. This iterative, simulation-based workflow embeds computational intelligence directly into the built form of the city, creating an urban fabric that is resilient, flexible, functional, and livable.

10 Minute Trip

Livelihood, at both individual and city scales, is dependent on the ability to move from place to place with relative ease and sufficient speed. The “**10 Minute Trip**” is a tool that creates a comprehensive visualization of everyday movement, from pedestrians to public and private transportation. The tool overlays these movement paths to a city map, providing a comprehensive view of the varying conditions of connectivity that exist within a layout. Simulations from movement from point A to B under different conditions is then introduced to optimise routes and designs.

CARBON FOOTPRINT

Continuous urbanisation has resulted in population growth, sprawling land use and changes in mobility behaviour. Despite public transit investments, congestion is worsening globally. The sheer volume of inter and intra-urban transportation has outpaced improvements in uptake of clean transport technology.

As a result, air quality has deteriorated in many cities, large and small, and city leaders are accepting that, at its core, poor air quality is an issue of public health and wellbeing. However, it is also an issue of environmental justice: air quality in cities tends to be worst in the poorest communities, and disproportionately affects vulnerable communities, such as the young and the elderly.

How can we improve city life? The quick answer is: **data**. Cities, in all their complexity, generate huge volumes of data, all the time. We can use these insights to optimise the systems that support our urban lives, from transportation and health, to energy consumption and safety. And these are real, tangible changes: by utilizing data, it's possible to **decrease emergency response times, reduce greenhouse gas emissions, and improve commutes**. Dedicated solutions help leverage smart data to maximise city potential.

By collecting emissions data and simulating measures that improve air quality, councils can adopt **AI-powered technology to remedy high carbon dioxide emissions** using reliable data. Highly-accurate air quality forecasts are projected using sophisticated algorithms based on historical data and current weather inputs. These prediction on level of CO₂ in the atmosphere can simulate actions that a city can take in the short term to avert breaches of air quality standards and limit respiratory stress on the most vulnerable citizens.

By ensuring data-driven decision making, cities are able to save on costs, maximise efficiency and foster long-term air quality improvements. The deployment of sensors and digital analytics provide unique opportunities for city leaders to harness data to make better decisions and take action in the short term. New digital technologies will contribute to tangible improvements in local quality of life by enabling citizens to improve their health and make more informed decisions about how they travel, and by giving city leaders a better understanding of the causes and severity of local air pollution.

Measuring citizens' carbon footprint is also an opportunity to introduce rewards, in the form of tax relieves or similar, to incentivise the population to adopt a greener and more environmentally-friendly lifestyle.

CHALLENGES AND REWARDS

Although there are clear challenges on the path towards ever smarter cities, the rewards are also substantial. Cities today are spontaneously becoming smarter, an evolution driven by technology, policy and stakeholder needs (i.e. citizens, governments, business). However, for the process to be efficient and effective a number of challenges need to be addressed. Such challenges include:

Joint private and public sector leadership – Leadership is key in setting the process in motion, providing the funding, deploying the assets. Such leadership need to develop the right balance between the public and private sector. The public sector should ensure medium to long term planning, real time coordination while private sector should provide the necessary market creativity in delivering solutions. In such context, there are two types of assets critical for the development of a smart city:

- **Physical assets** – Hardware and the physical investments needed to provide smart city functions. Within this area government should provide growth platforms based on effective infrastructure (e.g. ICT, electricity, health, waste management) while the private sector should then come in connecting to such infrastructure its physical assets and services;



- **Cultural assets** – Smart cities to be truly sustainable need to build on solid and well rooted cultural assets. The latter include strong sense of belonging, shared vision, information and education. The presence of such elements are critical to make smart cities happen. In this area city governments play a key role in developing roadmaps aimed to facilitate shared visions and creating the necessary platforms (physical and virtual) for the interaction among stakeholders.

Education and information – Engaging stakeholder is a critical area to ensure education in the initial stages of the smart city development and information in the following ones. In order to be credible such activities need to be based on a relationship of trust, which in turn requires strong ethics by those involved. This is true whether the process is driven by either public or private sector actors, both have important roles to play and need to be fully aware of the corresponding responsibilities.

Cyber exposure – In the increasingly digital and virtual world of smart cities, managing cyber exposure is an imperative. Such exposure goes beyond vulnerability to cyber attacks and encompasses also exposure to fake news and data privacy. The challenge requires both technological but also educational solutions. Such solutions need to be backed by a transparent governance and strong codes of ethics.

Inclusiveness and access – Access to smart city functionalities needs to be ensured across income levels, generational classes, education levels and spatial areas. In this area the public sector will inevitably have to take a role, the challenge lying mainly in the right level of subsidization and the form it should be delivered through (i.e. private, public or mixed vehicles).

Connecting the roots and reaching across the globe – Smart cities to thrive cannot grow and evolve in isolation. They need to connect their roots to their surroundings, to the non-urban districts and communities around them. In doing so they will create a multiplier effect, they will receive energy and resources while providing growth opportunities. At the same time smart cities will need to reach across the globe, networking with other smart cities and reaching across cultural and geographical boundaries. Doing so will allow them to thrive in the global smart city diversity through sharing and exchanging best practices.

BENEFITS TO THE COMMUNITY

Although the challenges may appear great, the rewards to be achieved are significant in terms of benefits to all of the community's stakeholders including citizens, businesses, government. Some of such rewards include:

- **Economic efficiency** - Providing more with less is one of the fundamental rewards of smart cities. It implies better use of energy, of transport and of infrastructure. It will also allow economic actors to be more productive by reducing time requirements for delivery of both goods and service, but also their optimal timing;
- **Citizens' well-being** - Enhancing the quality of life and making the city more attractive for its citizens is another key reward. It involves improved quality for the the environment, health and safety. It also involves more leisure time arising from more efficient commuting and access to public and private services;
- **Participation** – From a citizen point of view, smart cities can bring significant rewards in terms of sense of belonging. It can do so by ensuring greater participation of citizens in city decision making, promoting the sense of community, contributing to the building of network economies. The information flows provided by a smart city play a critical role in building up participation;
- **Economic growth** - Development opportunities are easily triggered by the networking and connectivity of smart cities. Such opportunities in turn lead to attracting jobs and companies and the ensuing economic growth. The increased attractiveness of smart cities is a substantial reward. It is delivered through improved infrastructure, expanded business networks, a more effective job market on both the supply and demand side;

- **Resilience** – Smart cities bring substantial rewards in terms of resilience. This involves resilience to economic shocks (i.e. local or sectorial crisis) through diversification of economic activities. It also includes resilience to climatic and health crisis including heat waves, hurricanes and, last but not least, the current pandemic.

THE IMPACT OF COVID-19

In light of recent developments and as some of the rewards of resilience relate to health crisis, one question emerges naturally: how does Covid impact the phenomenon of smart cities?

Covid-19 has enabled smartworking and thereby reduced the need to work from offices and to actually live in cities permanently. It has questioned the need and motivations to continue the urbanization trend and therefore the development of smartcities. The drivers of urbanization, mainly the scale that enables a wider use of resources by a larger part of citizens, will continue despite covid. The pandemic will, however, help to accelerate certain trends such as digitalization, cohesion and participation that are key levers for smartcities.

The Covid-19 pandemic and its economic fallout have caused governments, business and households to focus on short-term crisis management. Squeezed businesses, institutions, municipalities may be less willing to smart cities investments during this recession, but that would be short-sighted. Massive investment plans have been launched to help countries and sectors worst hit by the covid-19 pandemic recover quickly and this represents a great opportunity to foster the development of smart cities.