An aerial photograph of a city highway with multiple lanes of traffic. The highway is elevated and runs through a dense urban area with various buildings, including modern glass skyscrapers and older, more traditional structures. The scene is captured from a high angle, showing the flow of traffic and the surrounding cityscape. A semi-transparent white box is overlaid on the left side of the image, containing the text.

**Who will
create the
new digital
era?**

The SAP logo, consisting of the letters "SAP" in white, bold, sans-serif font, set against a blue background that tapers to the right. A small registered trademark symbol (®) is located to the right of the letters.

SAP®

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Foreword

In spring 2017, more than 100,000 people converged on Barcelona for Mobile World Congress (MWC) – one of the world’s biggest annual technology fairs.

We were there, of course, along with 2,300 other companies, to showcase how global firms can “run live” in a connected world. Running live means gaining instant insights and unprecedented agility, powering entirely new business models.

It was clear that exhibitors are embracing technology to deliver on the promise of digital transformation.

They’re supporting disruptive new business models, meeting the rapidly changing demographics of their workforce and customer base, and collaborating on technological ecosystems that can benefit society.

The congress focuses on the impact of connectivity and mobility on our society. Ubiquitous devices and connectivity are producing innovations in practically every area of life.



Foreword (continued)

Connected cars and connected cities have almost silently become part of our everyday existence, and we're seeing the beginning of massive cultural change as a result of digital disruption.

Data plays a central role in all of this, but there remain important questions to be answered. How can we collect this data? How can we handle and store it? How can we share it? How can we derive insight from it? And what does that insight mean for people's lives?

This paper explores the three major trends of MWC 2017, and attempts to help the reader understand their potential. We hope you find it useful and welcome your thoughts.

Join the conversation on Twitter at [@SAP_telco](#).

Pat Bakey
President,
SAP Industries at SAP

Ubiquitous devices and connectivity are producing innovations in practically every area of life.

Pat Bakey



The transformation of the **automotive industry**

Car manufacturers have always looked to make their processes and vehicles more efficient through technological innovation.

These improvements bring benefits to their own operations and result in better vehicles for customers.

Despite this, consumer demand for car ownership could slow down in the coming decade. The era of ride-sharing, driven by apps such as Uber and Lyft, has reduced the need for owned vehicles, especially among young people who live in cities. These millennials also have less disposable income than their parents' generation, and are more likely to avoid car ownership out of concerns over its effect on the

environment. Furthermore, there are concerns over the capacity of road networks in the western hemisphere to handle any more cars. Consequently, automotive companies of all types must look to develop new offerings if they're to remain competitive. This doesn't just affect car manufacturers, but car rental companies, parking companies, and fuel and technology suppliers too.

Connected cars – vehicles that are connected to the internet as part of the internet of things (IoT) – are well established. Since the late 1990s, they have been making their owners' lives easier by interfacing with the wider



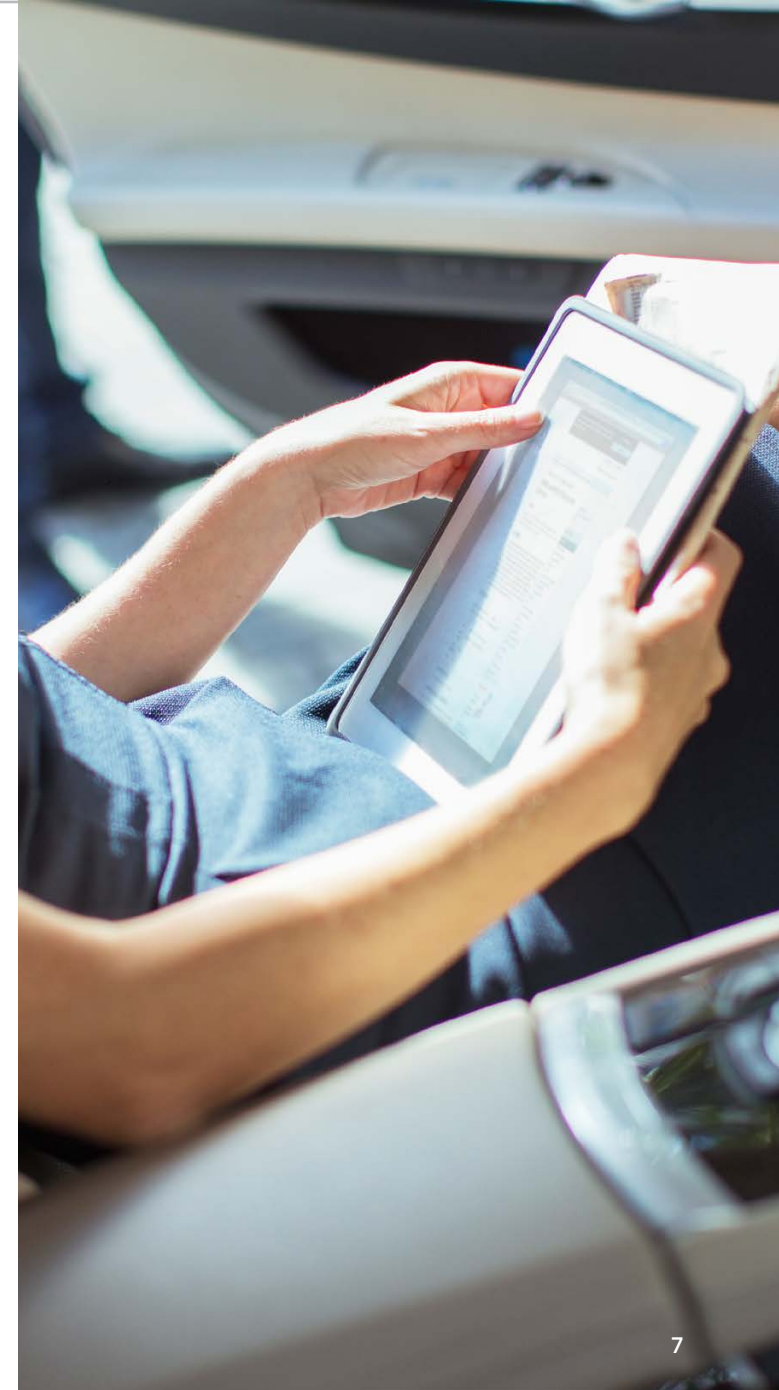
transportation infrastructure, including tolls, fueling stations, garages, parking facilities, and recovery services. The next leap is the autonomous car, with several prototypes already on public highways. However, there are philosophical, technical, practical, and attitudinal hurdles to overcome before they become an everyday sight on the road.

These developments take the car beyond traditional automotive supply chains into the world of IT. This expansion of an industry is a perfect opportunity for forward-thinking companies to gain a foothold. Companies have an opportunity to build an infrastructure for a sector where revenues are predicted to

quadruple between 2015 and 2020, adding more than US\$149 billion in revenue in the passenger car segment alone.

Take the example of our recent collaborations with Hertz, Nokia, and Mojio – three companies that are part of Nokia’s IoT network. Each firm plays its part in providing an intelligent, automated experience for Hertz rental car users.

It’s easy for users to pick up and pay for their cars, find the most convenient parking spaces, find gas stations and pay for fuel, navigate to their destination, and manage expenses if they’re business travelers.



NOKIA

Nokia provides its Intelligent Management Platform for All Connected Things (IMPACT) to control and manage devices and sensors in the vehicle securely. Users can also personalize driver settings and entertainment systems, as well as automatically configure in-vehicle communications without Bluetooth. IMPACT works in conjunction with payment systems in SAP's Vehicles Network for parking and fueling authorization.

Hertz

Hertz is developing new products and services for its car rental customers. It uses connected-car technology to integrate travel and itinerary planning, along with in-car personalization through its customer apps.



Mojo's cloud integration with the SAP Vehicles Network enables drivers to plan and reserve parking based on calendar events or search, as well as to find and pay for a space in real time based on the connected vehicle's location.



SAP's Vehicles Network makes any car smart and transactional by providing drivers with cashless access to on- and off-street parking and connected fueling stations. It minimizes unnecessary drive time and fuel expenditures, and helps reduce traffic and emissions caused by drivers searching for spaces.



What's clear is that building the connected-car ecosystem will require input from organizations beyond the automotive industry. It's an opportunity for companies in all areas of technology – from telecoms to cloud hosting – to invest and develop expertise in an industry with a colossal global potential for growth.

Connected cities

Cities will need to partner with the multitude of companies that provide the sensors, devices, networks, platforms, and software that make up a city's IoT.

Paul Taylor



The world's urban areas are predicted to be home to nearly 6 billion people by 2030.

They have long been a magnet for those looking for work, opportunity, connections and culture, but packing humans into a small area comes with the inevitable problems of traffic congestion, pollution, shortages of service availability, and crime.

Those seeking to improve urban infrastructures have long struggled to understand the complexities of their cities to find out where and how underlying structural problems surface as human problems. Since the dawn of the IoT, data collected from the city environment has provided new insight into how it works – who is going

where, what air and water quality are like, where money is being spent, and innumerable other metrics. The goal for city managers is to convert that data into insight, and that insight into policy to make cities more livable and their populations happier.

As SAP's Paul Taylor says : "The real value comes from breaking down the barriers between data silos, combining massive quantities of relevant data from multiple sources and then using technology to analyze it in real time, make decisions and take action. If a city gets it right, the results are better services and quality of life for citizens."

The world's urban areas are predicted to be home to nearly

6 billion
by 2030



Take soccer club Bayern Munich's stadium in Germany. On match days, the club has to manage an influx of 75,000 people, and it wanted to make that experience as seamless as possible for fans as well as organizers.

To do this, it collects data from systems in and around the arena, including parking garage systems, stadium entrance systems, and cashier systems. SAP HANA consolidates and processes the data, and detects critical situations before they arise. Staff get real-time access to the analysis of this data through a mobile app. This includes alerts when stadium thresholds are close to being met, for example. Fans will experience

less stress in finding a parking space, shorter queues in front of entrances and cashiers, and faster services at catering stations inside the stadium.

What's already working for Bayern Munich represents a microcosm of what could be rolled out citywide. But just as with connected cars, cities will need to partner with the multitude of companies that provide the sensors, devices, networks, platforms, and software that make up a city's IoT. Most likely, a public transportation system will have its IoT systems, parking providers will have theirs, air and water quality monitoring systems will have theirs, and so on. Making sense of all this data requires

a way to aggregate and analyze it quickly, and provide that analysis to the right people.

Connected cities promise their leaders the ability to make better decisions based on data rather than hunches or ideologies, but getting to this stage requires collaboration between cities and their commercial partners.



Digital disruption: A boost for equality?

The lack of women in tech isn't a philanthropic issue. It isn't a men issue. It's a system issue.

Dr. Patti Fletcher,
SAP SuccessFactors





Human civilization has been pushed forward by its technological developments. Fire, the wheel, gunpowder, the printing press, penicillin, the internet. Each breakthrough in innovation was accompanied by leaps forward in how human beings interact with each other.

Today, the internet – and the multitude of new opportunities for communication that it provides – is causing huge shifts in behavior.

Human cognitive bias has always existed, and has long been the cause of much inequality and suffering. Today, legislation, policy, and initiatives seek to foster equality. But decisions still have to be made by humans trying to understand situations from limited experience, or relying on belief systems that go unchallenged.

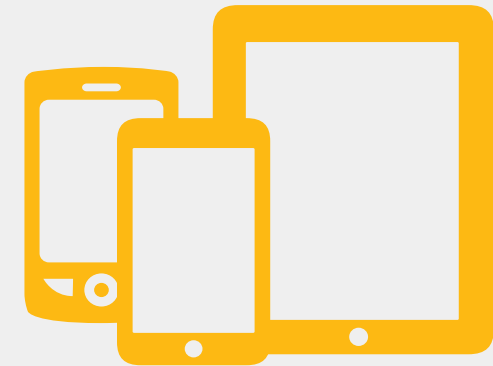
Diversity and inclusion programs in the workplace are designed to address inequality. This encourages a wider range of views to be shared, enabling organizations to more effectively address their diverse customer or user bases. Moreover, plurality in the workforce – whether that's in race, religion, nationality, sexual orientation, age, or anything else – gives an organization a better chance of finding the fresh ideas that can help it stay agile in a rapidly changing world.

Of course, technology could take systematic bias out of making business decisions, whether that's who to hire, or why a high number of people with a certain skill or from a certain age group are leaving a company.

Artificial intelligence, machine learning, and big data analytics can provide insight, and can do it before an organization makes those biased decisions that could lead to problems further down the line.

At MWC this year, the Women4Tech initiative launched, aiming to address the relative lack of female representation in the mobile industry. As part of this, Dr. Patti Fletcher from SAP SuccessFactors shared her research into equality in the workplace,

and explained that the infamous glass ceiling isn't just below the board, but sits firmly in middle management – the layer in organizations from which most workers are managed. This is significant, she explained, because the main reason why people stay or leave a company is because of their direct manager, and in technology, women leave at twice the rate of men. So how can we address this, when, as Patti points out, there are 150 unconscious biases at work in our brains?



“74% of the world's economy runs on SAP software. If we're not able to drive cultural change through technology, then who is?”

Dr. Patti Fletcher,
SAP SuccessFactors

Patti and her team identified the nine key decisions that determine whether an organization “hinders or harnesses” the best available talent, regardless of who that talent is. Companies use analytics to determine what problems they face – how well represented minorities are at each level, which parts of the organization are seeing the highest staff turnover – but this only serves to highlight issues without

solving them. Artificial intelligence could identify and eradicate bias in things like job descriptions, which can be subconsciously written to appeal to certain demographic groups – nursing jobs for women, software developer jobs for men, for example. Could machine learning enable unbiased performance reviews, assessing just the value an employee brings to the business? As Patti puts it: “No blame, no shame – just leveling the playing field.”



Conclusions

“Data is the currency of the 21st century – everything revolves around it. The insights we gather will help us shape a vision for where we must go. How do you make people happier? How do you make societies more successful and our environment more sustainable? This is where the world is going and technology will lead us.”

Bill McDermott, CEO of SAP SE



Conclusions

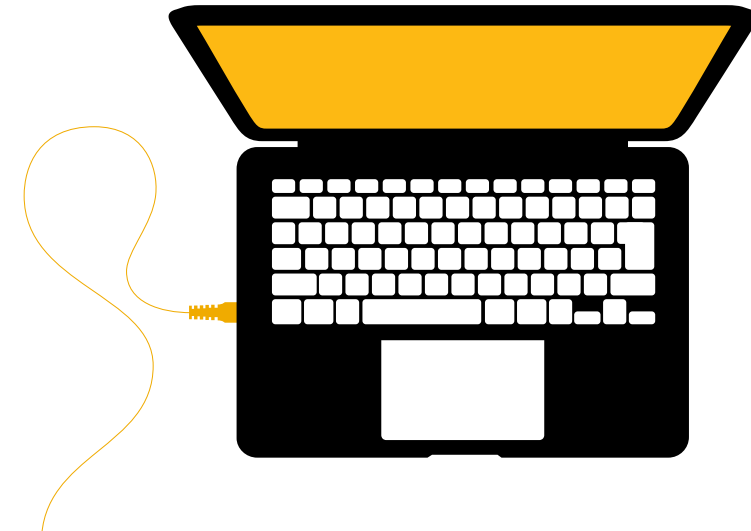
We've seen how ecosystems are forming around connected cars and connected cities, and we've seen the possibilities of these technologies. At the same time, new methods seem to promise new levels of objectivity in the workplace. But what links these seemingly disparate trends? The answer is data.

Data is the currency of the 21st century, and those who know how to collect, analyze, and derive insight from data will be at the front of each wave of progress.

An openness to collaboration, too, will be crucial. At SAP, we're proud of the network of partnerships we've developed to make the most of digital disruption. Not least among these partnerships is our work with Apple.

Ahead of MWC, we announced a software development kit that allows iOS developers to build beautiful enterprise apps for iPhone and iPad.

Mastery of data and an open attitude are what has driven the latest wave of digital disruption. They put organizations on the right footing to move fast, spotting new trends before they emerge, and being first to market with solutions that combine the best that each partner has to offer.



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