



# TECHNOVISION

Parallel Digital Realities 2 0 1 7

People matter. results count.

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# Foreword

As we introduce the 10th anniversary edition of TechnoVision, TechnoVision 2017, we remain inspired by the continued relevance, alignment, and adoption this thought leadership and digital transformation guidance have seen in the market globally. Consistent with prior years, TechnoVision 2017's authors and contributors have been motivated by the pace, source, and impact of emerging technologies, new business model introductions, and digital disruptions to further refine the content and its applicability to today's business opportunities and challenges. Our clients, partners, and colleagues have provided invaluable input and insights as they continue to experience TechnoVision and the many benefits it affords.

For this milestone edition, we resisted the temptation to radically alter, let alone re-orient, a framework that has proven increasingly successful and impactful in assisting global enterprises confront and respond to an ever more intense set of market dynamics. Instead, we continued to build upon and to refine what has already proven successful and delivered tangible business results. While most principles and a majority of trends have been replaced to recognize the pace of change in the market, the fundamentals stay:

TechnoVision continues to stand the test of time. We also continue to see attempts by others to emulate TechnoVision - perhaps a testament to the resiliency and value of this 10-year young model of applied intellectual capital.

We face an unprecedented time in business and in technology. A time that leaves no business, government entity or not-for-profit institution unaffected, regardless of size, location, or mission. The digital enterprise is a reality today as it will be for years to come. This enterprise and the environment in which it operates are complex, marked by continuous change and innovation, filled with opportunities, confronted with many challenges, and infused with a variety of risks - some of which with the potential to cripple the enterprise in multiple ways.

The questions we face are not ones of if, but instead ones of how, how fast, at what cost, who, with whom, with what certainty, at what scale, how secure and with what risk. The answers are not obvious and, once determined, the actions to be implemented may even present the greater challenge. Fortunately, there is guidance, direction, assistance, and an impetus to align and mobilize. Fortunately, there is TechnoVision 2017.

We wish you continued success in your digital journeys and offer TechnoVision as one of your most important instruments for charting your course, aligning your teams, and navigating your way.

With all of our very best,



**Lanny S. Cohen**

Group Chief Technology and  
Innovation Officer, Capgemini

# Introduction

You've seen our story about the [business technology mega trends](#) driving changes within organizations on their way to becoming digital enterprises. Now, it's time to play and get busy with the components behind these innovations to create your own unique, digital stories and incite real action.

## Welcome to the 2017 update of Capgemini's TechnoVision.

Yet again, we have put together 37 compelling technology trend building blocks—or more accurately, “boxes”—as a repository of inspiring, challenging, and disruptive perspectives.

This 2017 edition marks the 10th anniversary of the TechnoVision series and it also happens to coincide with the 50th anniversary of the Capgemini group: quite a special occasion indeed. We contemplated just how we have seen technology trends pop up over time, create business impact (or not), disappear again, or change into something entirely different.

One thing that's for sure, in a world that sometimes seems to be ruled by tweets, we accordingly heard a loud cry for simplicity: less detailed content, better summaries, shorter pitches. There is a reason why our hands-on “theater”, working with plain cardboard boxes and elevator pitches, turned out better and more effective than any other way of engaging with TechnoVision.

The 2017 edition ostensibly features these boxes again, with simplified one-pagers to accompany them that contain an elevator pitch and four sections: **What** (a more detailed description of the trend), **Impact** (the potential business impact), **Use** (examples of actual usage), and **Tech** (relevant technology links). Furthermore, more detailed content for each and every block will be made available through the Capgemini website as the year progresses.

The containers holding the 37 trends remained the same: **Invisible Infostructure** (about the evolution of infrastructure ultimately morphing into the pluggable utility it is meant to be), **Applications Unleashed** (liberating the legacy application landscape and unleashing the next generation of powerful, agile, cloud-based apps), **Thriving On Data** (leveraging data as an asset to increase the “Corporate IQ”), **Process on the Fly** (building processes that match the dynamics of the digital

outside world), **You Experience** (creating unique and excellent user experiences), and **We Collaborate** (tapping into the power of the connected everything). Also, the seven **Design for Digital** principles are a crucial mindset guide for creating the next generation of business technology solutions.

The main theme of TechnoVision 2017 is “parallel digital realities”: the need for organizations to meticulously mirror the capabilities of the digital outside world. Digital enterprises and “Digital” IT need to provide at least the same speed, intelligence, connectivity and experience as what the digital consumer—out there in the real world—is accustomed to. With these realities so entwined, there is no longer “digital” or “non-digital”; digital just *is* and quite soon may be forgotten as a concept.

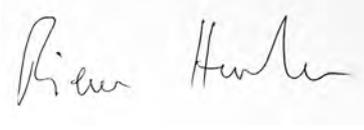
In TechnoVision, we capture the invaluable contributions of many of Capgemini's leading business technologists, all of them active through our [Expert Connect](#) community as well. A special mention should be made of our CTO network—led by our group CTO Lanny Cohen—that has been driving the bulk of the efforts. Every contributor is happy to further engage with you on the topics they have covered, so do not hesitate to contact them; in fact, they expect you to do so.

Also, we're very open to hearing from you how we can improve further, so feedback and suggestions are more than welcome. We like sharing our perspectives and hope you can build on them.

Now, what's *your* story?



Ron Tolido  
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# Ten years of TechnoVision: Lessons Learned

It sounds like an oxymoron: a sustained decade of identifying and presenting technology trends. And in a way, it is. While we all acknowledge that technology drivers pop up and disappear at an ever-increasing pace, we find that the way they are presented, absorbed, and used is rapidly changing, too.

The following hits and flops taught us a thing or two about the process:

- Few appreciate complexity. And just for your information, a two-dimensional matrix that maps business drivers on technology trends is considered by many to be abhorrently complex. In the first few years of TechnoVision, we preferred to directly apply the TechnoVision content and it discouraged (or downright scared) more people than we ever anticipated.
- After this sobering experience, we turned to storytelling as the way to get real with the TechnoVision trends. Overall, it worked much better for our audience, although various IT specialists (typically blessed with analytical skills) asked for a more systematic approach...you know, like using a two-dimensional matrix.
- A few years ago, we achieved a breakthrough when colleagues created a simple set of 37 cardboard boxes adorned with the elevator pitch and accompanying visual. People loved to touch the colorful boxes, carry them around and stack them up. This low-tech way of building and communicating a storyline turned out to be the missing link in digital storytelling.
- Choosing the right names for trends and technology clusters proved to be crucial for their acceptance: we changed the visionary but unintuitive “Sector as a Service” to “Applications Unleashed” for this reason. Equally so, the early “From Transaction to Interaction” cluster had a much better life when it was rebranded to “We Collaborate.” In names, we have always been looking for a delicate balance between a certain level of self-explanation, intriguing associations, and a light-hearted tone. “Train to Scooter” did very well for us, just like “My Data Is Bigger Than Yours,” “Business, Mon amour,” and “What Would Amazon Do?” Putting “no” in front of a technology or concept has also often worked wonders.
- A bigger crew does not always guarantee more success. The year we failed to produce an update was when we invited too many skillful and visionary contributors to work with us. The lessons learned in open source projects apparently apply to us as well: minimize the leadership core but maximize the “halo” of people that are willing and able to build on it.
- Detailed content is usually overrated by its writers and underrated by its receivers. It may be a sign of the times: as we now live in an era where the world can be ruled by tweets, we have consistently cut the amount of content produced and presented. Therefore, a desire for more simplicity is arguably the most notable phenomenon we have observed. TechnoVision 2017 is no exception. For the first time, we have limited ourselves to one-pagers for each trend. We realize it may still be too much for some and way too little for others. That’s why we have created an online platform for TechnoVision that will allow us to add more content to each topic, to accommodate the “free spirits” that like to disconnect their smartphones and dive deep into the subject matter.

What may future versions of TechnoVision look like? Will they be communicated through tweets, Snapchat pictures, an augmented reality application, a specialized chatbot, Amazon’s Alexa (or perhaps her lookalike)? Why don’t you pick up a few of the 2017 boxes and weave together your own unique Digital scenario? We’re sure you will tell us some good stories and we’re all ears.

# TechnoVision 2017 and “Digital”

If you suffer from digital fatigue, you are not alone; long-lasting fashion is tiring. The word has been used, abused and misused—especially by those of us who understand it the least. . .

It might well be that the time has come to drop the word digital. It is no longer relevant to qualify our epoch as digital, it just *is*. It is no longer relevant to look at ourselves as digital people, we just are. It won't be relevant much longer to ask for IT to become digital, it just needs to *be*. It won't be relevant much longer to ask for enterprises to become digital, the won't exist if they are not.

If we drop the word digital, what do we see, what do we have? Two characteristics of our time overshadow all others.

**First**, we live in the third era of information technology, the era of cloud computing. After mainframes for central computing, after distributed computing, we are lucky enough to live in the age of ubiquitous computing. Computing power is available everywhere (or close); intelligence is accessible on the go; the world's memory is at our fingertips; the cloud binds everybody and everything to everything and everybody, anywhere.

This changes our ways of living and working; this changes every product and service we use; this changes every company or institution. This changes, or will change, every behavior, every mentality—our cultures, our civilizations.

**Second**, we no longer live in one world, we do live in two worlds, joined at the hip: the physical one we have known for a long time, and the virtual one we are building day by day.

This all started with objects, their 3D images springing to life, now functioning, revving up, vibrating, failing, recovering in the virtual world. As persons, we each have our twin: living, working, traveling, connecting in the virtual world. Enterprises and institutions all have their twins acting and transacting in the virtual world—so much so that they become the sum of their two existences, real and virtual.

## And TechnoVision in all that?

TechnoVision plays two roles in this new era, in these two worlds.

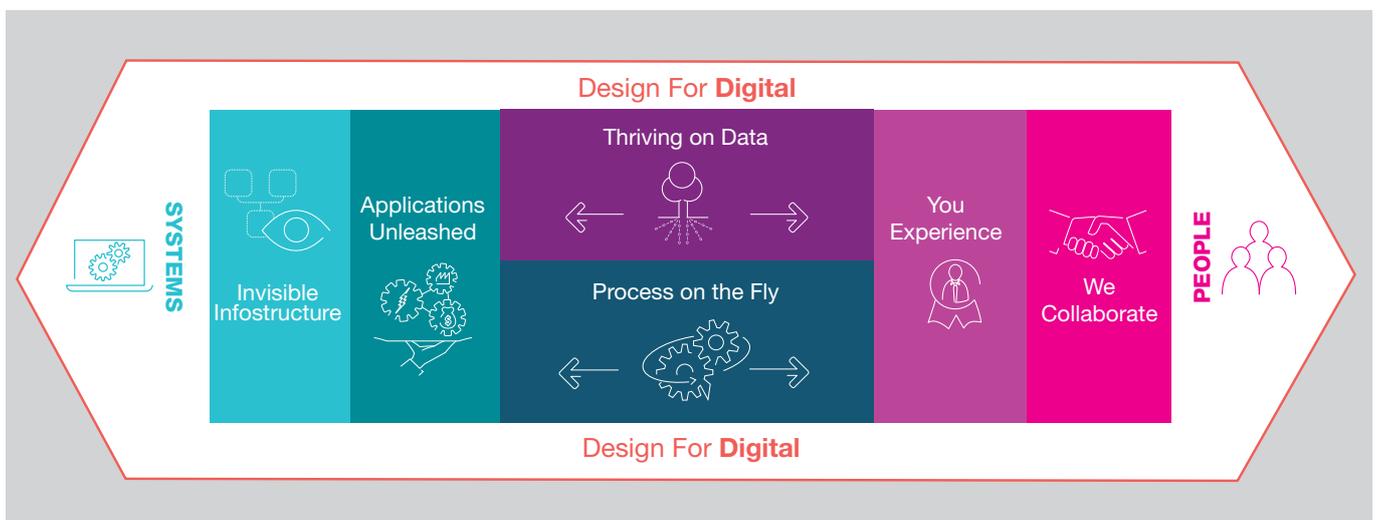
The first role is to help **decrypt** them. The physical world is complex enough; the virtual world grows explosively; the torrential development of virtual twins defies human understanding and ability to adapt. Modestly, year after year, TechnoVision helps a bit to structure, organize, relate, explain.

The second role of TechnoVision is to help **navigate** the new waters. Understanding is not enough, the real question is: what to do? We need stories to reassure us, guide us, motivate us. TechnoVision is designed to tell stories—stories which become applications. With seven principles and thirty trends, it offers building blocks—or more concretely, boxes—that you can arrange, add up, relate, or discard to help tell your story. Their reality makes it easier to cross the bridges between the two worlds we live in.

# Overview of TechnoVision 2017

As you may recall from earlier TechnoVision versions, we categorize technologies with business change potential in six clusters (the “what”). Two of them cover the foundational building blocks of a typical IT landscape (Invisible Infostructure for infrastructure and Applications Unleashed for the applications landscape). Two of them cover crucial IT capabilities to deal with high-speed, high-impact digital change (Thriving on Data for leveraging data and Process on the Fly to manage processes). The final two cover channels to the outside, connected world (You Experience for creating compelling, individualized user experiences and We Collaborate to tap into the power of social connectivity).

TechnoVision framework



When read from right to left, we see how the “real” world of people and their things is mirrored in a virtual world of systems and digital solutions.

Also, there is a crucial cluster of overarching design principles (the “how”) that should be kept in mind throughout the lifecycle of applying technology to Digital Transformation: Design for Digital.

The 37 building blocks are all described through one-pagers. This represents a conscious move away from an abundance of content, a lesson we have gradually learned over the course of 10 years of TechnoVision.

Each building block contains an elevator pitch that briefly describes the trend. Then come the “What” (a slightly more elaborate description), the “Use” (actual use cases), the “Impact” (potential business effect of the trend) and “Tech” (links to leading technology solutions).

There is a certain method behind the sequence of the building blocks within a cluster as well. The first building block is the “101” trend that sets the scene for the entire cluster, covering key technology drivers and their overall effect on business. The second one is more or less free format, giving the contributors the chance to highlight a technology driver that is particularly hot. The third block explores the impact of automation on the cluster, which we deem a powerful, overarching theme that influences the entire business technology landscape. The fourth block zooms in on how the notion of platforms relates to the cluster. Finally, the fifth block typically introduces a more disruptive, forward-looking dimension of the cluster.

The seven Design for Digital principles are described through yet again an elevator pitch, followed by the “Why” (the reasons for principle), the “What” (a slightly more elaborate description), the “How To” (guidelines on how to apply the principle) and the “So What?” (the relevance of the principle).

If you still possess an unabated appetite for more, the [TechoVision](#) microsite contains a growing number of detailed posts and articles that dive deeper into each and every one of the 37 building blocks. Also, if you happen to run into the 2017 edition cardboard boxes, you will find a QR scan code on each block that will bring you directly to the relevant materials.

Have a look at the TechnoVision 2017 building blocks:

### Design for Digital

Overarching design principles to be followed throughout the lifecycle of applying technology to Digital Transformation.

- Le Roi Cloud
- Twin Worlds
- Speed Platform
- IQ Up
- Trust P&L
- Hack My (Business) Model
- What’s Your Story?

### Invisible Infostructure

Evolving the IT Infrastructure into the pluggable utility it was supposed to be.

- Virtual Lego
- Let’s Get Physical
- Build, Release, Run, Repeat
- Orchestrate for Simple
- Ceci n’est pas une infrastructure

### Applications Unleashed

Liberating the legacy application landscape and unleashing the next generation of powerful, agile, cloud-based apps.

- All in the Catalog
- Bot is the New App
- Kickstart my App
- API Economy
- App Maker Movement

### Thriving on Data

Leveraging data as an asset to increase the “Corporate IQ”

- My Data is Bigger than Yours
- You do the Math
- At Your Service
- Data Apart Together
- Max Machina

### Process on the Fly

Building, managing, and running processes that match the dynamics of the digital outside world.

- Shades of Process
- No Process
- Rock, Robot Rock
- Silo Busters
- Work that Machine

### You Experience

Creating unique, excellent user experiences.

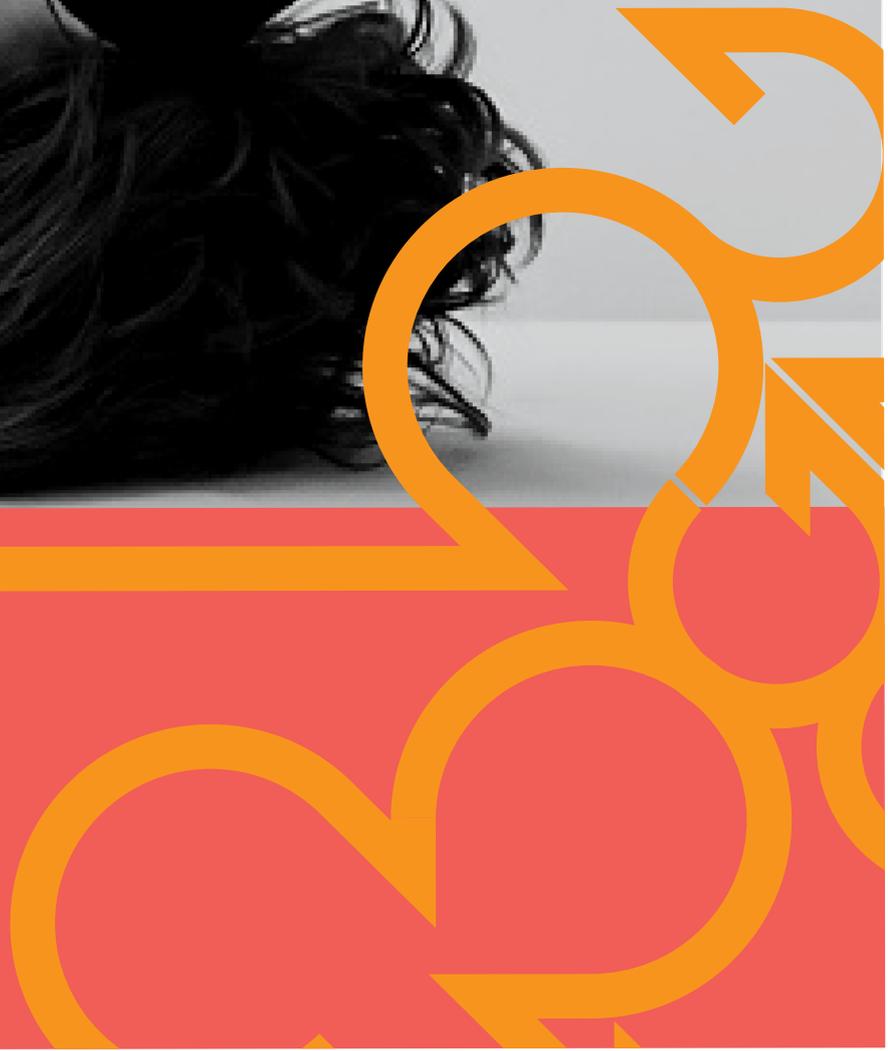
- I’m Happy
- Chat Me Up
- The Bot Effect
- There’s a Platform for That
- Reality Bytes

### We Collaborate

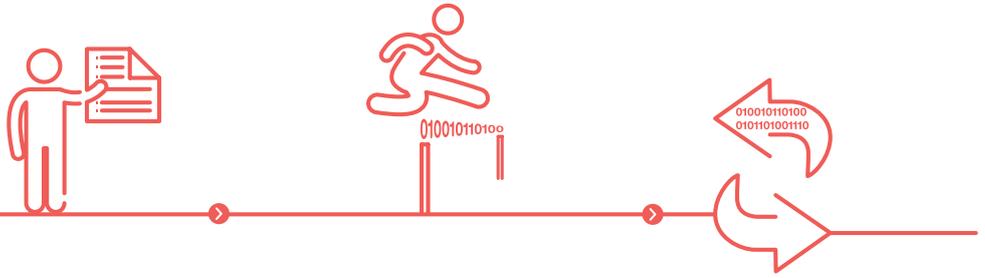
Tapping into the power of the connected “everything.”

- Happy Together
- You@Work
- New Chain on the Block
- Crowd Surfing Allowed
- Friend that Thing

# Design for Digital



# DESIGN FOR DIGITAL



***Design for Digital is different from the other clusters: it wraps the 6 operational clusters; instead of 5 trends, it offers 7 principles; it doesn't describe, it prescribes.***

Its ambition is to serve as a guideline to design the right solutions for our world – which is digital by default. Each of the principles might look innocuous enough; taken together, they are a tall order. Cloud is king, nobody escapes its jurisdiction; we build in Twin worlds, real and virtual, joined at the hip; the enterprise's platform makes it agile; corporate IQ must go up to remain competitive; Trust is so precious one has to count it; every tradition deserves to be hacked; between enterprise and customers, transactions give way to stories.

This ambition might well be excessive – who are we to prescribe? Who can master the complexities of our twin worlds? Who knows what will be right tomorrow?

But we hope the principles of Design for Digital have at least one merit: to draw our attention to new ways of designing – not just systems or solutions, but the enterprise itself.





There's a new ruler in town. And just like the Sun King, his reign will be long and prosperous. The cloud started as an achievement of computing as a utility, the plug to computing power. But now, it's an overarching mindset that connotes immediate availability, maximum flexibility, continuous updates, unlimited scaling, and full connectivity. With that, just "moving to the cloud" is not enough: for the next generation of solutions to be digital, no data or catalogue can be ignored, no acceleration missed, no connection omitted, no delay accepted. Exploiting 720° of the cloud potential—in all its dimensions—is the key starting principle for the digital world. The old ways are dead. Vive le Roi!

### WHY

- The digital world is a real-time world made of instant reactions, constant innovation, nagging impatience, impulsive failures, and hit-and-run successes.
- To cope with this new reality, *immediate computing* like computing power spiking and ebbing, updates applied without delay, development carried out both immediately and continuously, and contained data floods are required.
- Only the cloud can provide this level of applied digital agility. For both for IT, and perhaps more importantly, for a business, it opens up an infinite palette of possibilities, stretching both imagination and intelligence alike.

### WHAT

- Take the qualities of the cloud as a rule, not an option, for your new endeavors
- Just *use* cloud-base services – don't invest in infrastructure
- Work from what's in the cloud catalog, rather than re-inventing your own solutions over and over again
- Develop continuously and in perpetuity
- Create *now, here, and together*

**Each development is a cloud computing development, drawing solely on cloud resources and capabilities – computing power, memory, intelligence, paths.**

### HOW TO

Going 720° on the cloud unfolds in two ways:

- The *technical* way: move to infrastructure-as-a-code, infrastructure provisioning automation, software "container" units of production, serverless application architectures, micro-services, and Software-as-a-Service.
- The *human* way: go beyond the necessary training, develop "cloud-compatible" mentalities and the matching governance with self-organized, customer-driven, agile teams.

Combine the two and create your *Digital IT* processes and organization at the very heart of the digital enterprise.

### SO WHAT

- As with many advances in IT, the cloud has already generated both big hopes and crippling anxieties; they rank from fears for privacy and security breaches to the lock-in power of dominant cloud providers.
- This calls for new rules, new behaviors and a new level of transparency regarding the use of cloud solutions.
- A new benchmark is already in place both on the IT and the business sides; that's how easy and powerful solutions should be developed and deployed.



your expert

Nicolas Gaudillière



In the digital world, everything acquires a virtual life or even a *twin life*: an identity, an image, an existence, a way of working, a reputation. While the concept of “digital twins” started with physical objects, it now extends to people, to processes linking real and virtual steps, to thought processes by automation and artificial intelligence, and to enterprises and institutions. The digital enterprise *is the sum of twins*, virtual and real. New developments no longer just improve the mastery of the real world. They build up, step by step, the various facets of the digital twins. What happens in the real world must also happen in the virtual world, and vice-versa.

**WHY**

- For digital systems to have control of the physical world, they must *represent* it, *control* its representation, and *apply* this control to reality.
- Furthermore, the virtual representation has to be perfectly accurate in order to be useful. This extends to their behavior.
- The digital twin of an aircraft engine is not only statically replicated; it also works like its real counterpart. As a result, all engineering changes, test runs, and maintenance can be *performed* on it before being performed in the real world.

**WHAT**

- The notion of “twin objects” can be expanded to digital representations of people, thought and business processes, and even complete enterprises.
- These models not only contain current states and connections, but also observed and projected behavior.
- All thought and decision-making processes use these digital representations, removing the discontinuity that separates virtual and real worlds.

**HOW TO**

- Entering Twin Worlds requires a mindset change to understand how digital systems actually reflect and control the real world.
- Accepting errors, inaccuracies, or latency is replaced by the *constant demand* for both accuracy and control. It requires a consistent data landscape where governance, trust, and accessibility are core concerns within the fabric of the Twin Worlds.
- A virtual representation of the real world needs to be built up step by step, incorporating an increasingly better understanding of the key real-world assets and an improved ability to translate them into digital terms.

**SO WHAT**

- The digital twin of a physical object can be tangible enough but augmented or virtual reality can make it life-like even if the complex ones are difficult to recreate.
- The twins of persons, processes, or institutions are less tangible, and are consequently challenging to grasp.
- The key is to constantly take a *virtual world perspective*: how do consumers, corporations, and products behave digitally, and how is this translated into the next-generation digital IT landscape?

**Each development enriches the virtual world, progressively building digital twins of people, (thought) processes, objects and enterprises.**



your expert

Steve Jones

# SPEED PLATFORM



There's a need for digital speed. Waiting for requirements from business or external partners to arrive is a recipe for disappointment: too little, too late, and irrelevant-on-arrival. Instead, provide a compelling digital platform with services that your own IT department can use. It will enable the business, its partners, and even its clients and consumers to rapidly build their own solutions while leveraging enterprise-grade data and services. As new developments are built on the platform to launch services with greater speed, they should add new, improved features to it as well. From now on, it's Platform First!

## WHY

- The clock pulse of the digital world requires different flavors of speed and agility in order to make solutions available. These include “train”-style dynamics for robust, predictable enterprise solutions and “scooter-style” dynamics for innovative, viable products.
- Although the solutions may differ widely, they need to be connected and based on a corporate common ground to address security, privacy and integration.
- The future needs of the digital enterprise and its external ecosystem are impossible to predict. A requirements-driven approach is, by its very nature, too slow, and creates a gap between business and IT.

## WHAT

- A digital platform typically features APIs, open datasets, service catalogs, integration, frameworks, playbooks, tools, and development support.
- It supports self-service tools to quickly create solutions, but also features a high level of automation to ensure productivity and enterprise-level security and integration.
- It provides the “art of the digitally possible” to anybody that needs to develop solutions within the IT department, the business side, or externally.

**Each development builds on and adds to the digital platform – the agile foundation for speedy solutions with enterprise-grade quality and scale, internal and external.**

## HOW TO

- Create an overall architectural blueprint for the digital platform, but build it iteratively: a Minimum Viable Product will create early excitement and commitment while mitigating development risks.
- Make the platform applied: offer “internships” to internal and external stakeholders to jointly explore the platform services and create the first solutions. Consider setting up a platform center to accommodate this.
- Develop processes and incentives—and if necessary, directives—for using and contributing to the platform catalog.
- Handle the platform as a product that needs to be “commercially” marketed and managed.

## SO WHAT

- The platform mindset requires a thorough understanding of what drives both the supply and the demand sides of the platform; the number of enthusiastic, committed users ultimately determines it's success.
- It also challenges the concept of central, requirements-driven development in favor of decentralized enablement.
- To a large degree, the platform determines the speed and agility level of the enterprise. It also is instrumental in raising its corporate IQ and digital trustworthiness.



your expert

Ron Tolido

# IQ UP



Digital capabilities already enhance the IQ of both the people and the many corporations that need to keep up with the pace and the intelligence of the world. Now, 100 years later, comes the automation of the virtual world—a parallel development to the physical world’s automation—and with it, the arrival of artificial intelligence. AI builds the “exoskeleton” for our brain and senses, and provides advanced algorithms to predict and even prescribe our future state. Leveraging all of this to raise our Corporate IQ (CIQ) is the next big transformation theme for the digital enterprise. More information, more connections, faster reactions; the only way is up.

## WHY

- Corporate IQ is still uncharted territory: it is difficult to define, to measure, and to compare. But digital customers, clients, and partners can gauge it. They now judge companies directly rather than uniquely through their products and services. Expectations have evolved from IQ behaving reasonably to behaving intelligently: the more intelligent a digital company looks and feels, the more it will be liked and therefore preferred.
- This is why CIQ must be on the agenda as the ultimate and most difficult to emulate differentiator; now, raising the CIQ becomes an essential objective, which puts new demands on the IT organization.

## WHAT

- When an Amazon virtual agent advises you, guides you, and shares its treasure trove of experiences with you, you see and feel the company as an intelligent enterprise. Take a leaf from their book: develop your own intelligent stories.
- For IT applications, codifying the knowledge and experience of an enterprise is no longer enough. They now must measurably and continuously raise one or more aspects of its intelligence of its Corporate IQ.

## HOW TO

- The first step is to analyze which aspects of Corporate IQ are influenced by alternate solutions. Typically, these aspects would be grouped into areas that interface with users, monitor and steer activities, service work items, analyze data, or manage knowledge.
- The second step is to assess and describe the CIQ increment that the new solution can bring, resulting in a measurable contribution to business outcomes.
- The third step is to maximize this increment within the application itself, through links with other data and solutions, or through additional perspectives and assets from clients and partners.

## SO WHAT

- To generalize the Corporate IQ dimension, the evaluation of all potential investments will move to measure their expected “ROI,” where the “I” now ostensibly stands for “Intelligence.”
- In the same way that our character should match our intelligence, Corporate IQ should strengthen various aspects of a firm’s desired reputation; for this reason, IQ Up and Trust P&L should be considered for all developments.

**Each development bears upon one or more facets of the enterprise’s corporate intelligence quotient – CIQ – and raises it measurably.**



your expert

**Christopher Stancombe**



Trust is the key to a solid digital reputation. It is painstakingly built yet easily destroyed due to a lack of cybersecurity or the careless use of personal data. And with regulation only increasing in intensity, it's obvious that trust needs to be cherished, just like any other key asset on the corporate balance sheet. This calls for a full understanding of the latest in data privacy and security technologies and a Privacy by Design mindset. It brings a new responsibility during solution creation: to be the accountant of the enterprise's trust balance not only by protecting it, but also by positively adding to it through each and every new development.

### WHY

- The digital world is a world of relations. Relations are built on trust; therefore, trust is a necessary ingredient for success in a digital enterprise.
- Without trust, there is no connection between enterprise and customers, no distribution of intelligence or roles between B2B partners, and no shared data lake.
- Trust is built at human speed and destroyed at Internet speed.
- Fraud and hacking are obvious trust killers but barrages of invasive advertising, the constant stabbing of the private sphere, and the rain of invasive offers—not to mention fake news—are effective passion killers, too.

### WHAT

- The digital enterprise has to introduce trust accounting, where trust is measured, assessed, and counted. Every digital initiative or investment has to yield a trust increment or at least avoid trust loss.
- With trust accounting comes trust accountability. Designers, developers, and cybersecurity experts need to become the guardians of trust and design thinking is needed to address how to cultivate trust between clients, customers, employees, and partners.

**Each development contributes to the enterprise's trust capital through a positive trust bottom line.**

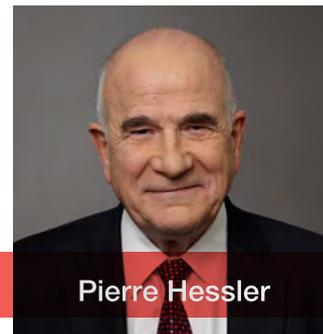
### HOW TO

Designing for trust needs to be transparent, bidirectional, offensive, and defensive:

- **Transparent:** cybersecurity has to be seen or perceived. The private sphere must be unambiguously recognized, sensitivity to data protection must be patent, and the use of personal information circumscribed.
- **Bidirectional:** trust is a two-way street. Trust others so that they trust you.
- **Offensive:** seeking trust gain by replacing the weak links in the trust chain by a blockchain
- **Passive:** avoid trust loss through precautionary measures and cybersecurity.

### SO WHAT

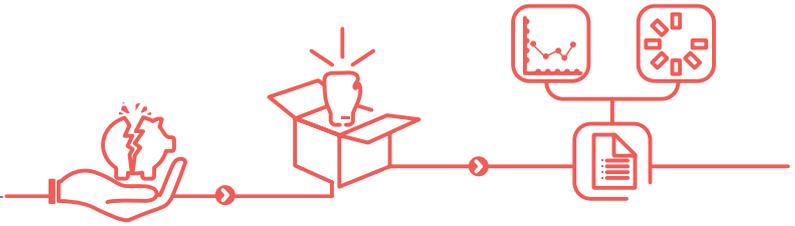
- The more the digital enterprise becomes relatable, intelligent, and trusted, the more it gains power.
- If trust is the currency of the digital world, power is its rule: it can be gained at network speed and dominates globally but runs the risk of vanishing at the blink of an eye.
- Using the trust dimension to leverage power intelligently might be the best survival kit in this digital world—or is it a digital jungle after all?



your expert

Pierre Hessler

# HACK MY (BUSINESS) MODEL



Heck yes, it's definitely the age of digital disruption, with new technology as the engine behind radically reinvented business models. Or should we say just "models?" Clearly, disruption has hit the ways supply and demand meet in the open market place. But with a growing grasp of the digital world, we see that the impact of disruption goes way beyond business models. It includes governance, processes, traditions, and behaviors. This is a tall order for solution designers: their creations have to be game changers with a measurable contribution to the permanent digital transformation companies undergo.

## WHY

- After automating the existent and reengineering processes, digital solutions become the agents of disruption, affecting enterprises that both seek disruption or are submitted to it. As such, digital solutions are actually digital transformers.
- Disruption started with "hacking" business models, driven by the radically changed and constantly changing expectations of digital consumers to start a dialogue, buy, and receive services in the ways that suit them best.
- But business models are just the beginning: the digital revolution penetrates deep into an enterprise... no domain, no rule, no governance, and no mindset escapes it.

## WHAT

- The decision to invest in digital solutions introduces a new parameter: the measurable disruption a new application will cause. Investments that protect, solidify, or embellish the established order are no longer worth it.
- Don't forget that not only business but also IT has to transform its traditions and institutions, creating new customs after the decision to invest, design, and prototype based on digital solutions.

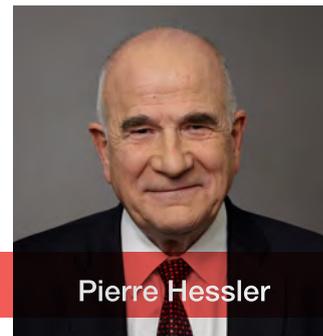
## HOW TO

- Keep hacking business models. Too many outdated approaches are still intact. After disrupting customer relation business models, think of client relations as business models: write the scenarios and scripts of the new roles in your digital ecosystem.
- Then, hack your other models. Revisit employment to give digital employees and freelancers the workplace they want. Rethink R&D to open it up, attach umbilical cords to your connected products, think twins for service, flex your budgets, report the future...
- Finally, hack behavior. Use the new solutions to change mentalities and design new partnerships.

## SO WHAT

- "Hacking" as an activity may sound destructive to some, even if it adequately reflects the vagaries of digital life. Luckily, this design principle does not stand on its own. It will work best in harmony with the others: by all means hack, but make sure your Corporate IQ increases while doing so. Hack, but make sure your Trust balance profits from it. Hack, but make sure your Story sounds constructive to your customers, clients, and partners.

**Each development challenges the established order and embodies new ways of thinking and acting.**



your expert

Pierre Hessler

# WHAT'S YOUR STORY?



Your digital solutions are fighting for intellectual shelf space to exist and to survive in your enterprise. The way to achieve both is to tell a compelling story. Such a story depicts the digital world and shows the way to El Dorado. It speaks to intellect by designing the path and to emotions, making the audience just want to get there. Because we're only human, we prefer compelling stories to dry information, set questions, and formatted answers. The ability to tell a story—and even better, to listen to one—is critical to create digital experiences that excite and delight. It is both a pedagogical and a design tool, and it needs your mastery. End of story.

## WHY

- Information systems have come a long way, from dispensing predefined information in bits and pieces to entertaining conversational transactions and augmented intelligence. It has grown into an essential part of the day in the life of customers, partners, and employees alike.
- With so many options to choose from and a plethora of distracting or confusing features, digital users are now also the producers of their own digital journeys,
- The only way to get and keep someone's attention is to make them part of a story, not just as readers, but also as writers or even better, as co-writers and actors.

## WHAT

- For each development to tell a digital story, its creator needs to become an artist. The writer must appeal to the creative and esthetic side of the brain while remaining an engineer to give the story the logic, rigor, and metrics of IT.
- This is at the heart of Design Thinking, combining the notions of purpose, human-centricity and iteration.
- The story should not stand alone: through connections with other stories, the digital enterprise creates an anthology of its relations with the world.

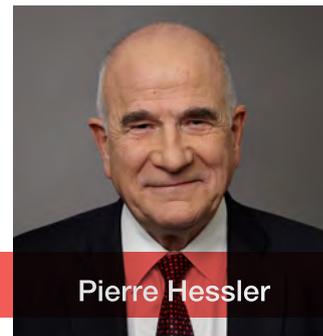
## HOW TO

- From oral tradition, to the written word, and now to digital copy, telling a story is the oldest method for recording, teaching, communication, and entertainment. You learn the craft by listening to the best ones.
- Think through your solution as a story with a good structure from beginning to end, from issue to resolution, from understanding to adhesion, from neutrality to support.
- Use your story as your design to inspire architecture and drive content.
- Tell your story early by inviting users, listeners, and actors to iteratively participate in its development.

## TECH

- The Design for Digital principles are to be seen and used as a whole: the story hatches in the clouds, it stages the play of twins, draws momentum from the platform, makes listeners and players more intelligent, exudes trust, and gently hacks our customs and traditions.
- Over time, stories become the signature of the digital enterprise, the reflection of its style, and the yardstick of its differentiation. Consider the story unfolding before you in these white little boxes...how does it move you?

**Each development tells a compelling story with the declared purpose and result of enriching the narrative of the digital enterprise.**



your expert

Pierre Hessler

# Invisible

Infostructure



# INVISIBLE INFOSTRUCTURE



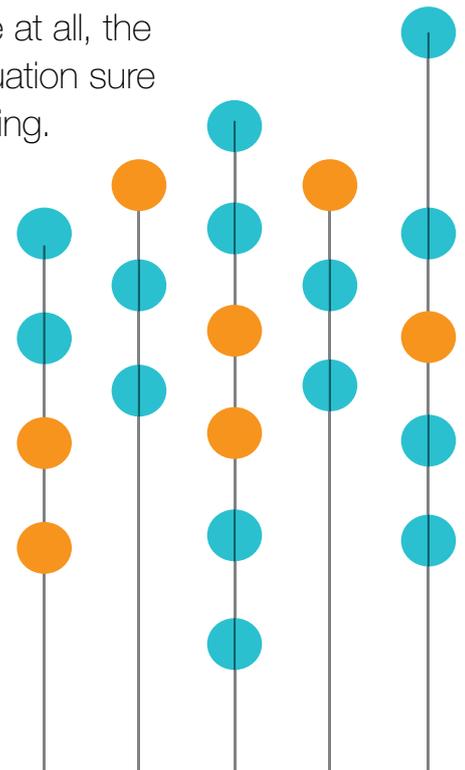
**The infrastructure part of the IT landscape is the crucial foundation for any organization with “post-digital” ambitions. It must deliver the speed, agility and trustworthiness that both the organization and the outside world have come to expect. It also must be able to capture, hold, and provide the data that is needed to continually increase the corporate IQ.**

It doesn't mean that we must meticulously design, construct, and implement our own unique and dedicated IT infrastructure. Instead, we can combine the necessary IT services right from the catalog, as pre-defined, easy-to-combine, Lego-style building blocks. As this is an ongoing transition, most organizations – unless they are starting from scratch – will have to mix the existing and the new, the stable and the innovative, customized and standard, on-premise and cloud-based. All this

while making infrastructural services simpler and easier to consume. Radical automation is the key driver to success, as it will provide both the simplicity, trustworthiness, agility and speed that are now the norm.

As the real and virtual world are merging into one, so will our infrastructure have to evolve into an “infostructure” that is able to build digital twins of whatever relevant, connected physical asset is out there.

And as we are entering the era of server-less solutions that do not require any infrastructure at all, the “invisible” part of the equation sure gets a whole new meaning.



# VIRTUAL LEGO



Here are some bricks you actually want to step on. Virtualization is the key ingredient for rendering the IT infrastructure invisible and benefiting from cloud-based building blocks. It reduces costs and deals with the mounting complexity of divergent technology. What's more, with infrastructure rapidly composed from Lego-style building blocks, businesses can become more agile, more responsive, and scale-up faster. A complete, software-defined infrastructure stack can be deployed in minutes. With "micro services" running in independently deployable containers, it's no child's play; it's a powerful enabler to running a business with similar qualities.

### WHAT

- Hyper-Converged Infrastructure (HCI) is an infrastructure system with a software-centric architecture that tightly integrates compute, storage, and networks in commodity hardware.
- The Software Defined Data Center (SDDC) and Software Defined Networking (SDN) build on this, virtualizing the components and delivering them "as a service," decoupled from specific technology choices.
- With compute, storage, network, and software packaged in autonomous, independent software containers that run micro services, IT infrastructure becomes an ultra-flexible, highly scalable commodity.

### USE

- Netflix, perhaps one of the best advocates of the Virtual Lego approach, rapidly deploys services across multiple AWS accounts and regions over 4,000 times a day. They build and evolve a pervasive, global service that balances service availability, latency, data replication, compute capacity, and efficiency all with standard building blocks.
- Using software containers, a UK news agency reduced its continuous integration of job time by 60%, while also allowing multiple jobs to run at the same time. This significantly improved speed-to-market and reduced the number of errors committed due to inter-dependencies.

### IMPACT

- Reduction of infrastructure costs and complexity, cutting down on technology options and integration issues
- Infrastructure meeting directly with business, together building a floor-to-ceiling capability; combining compute, network, storage, and software to create real business outcomes in minutes rather than weeks or months
- Technology diversity and loose coupling of components, all while taking a very elastic approach towards resiliency and scalability

### TECH

- **Industry standards**
  - [OpenFlow](#), [Cisco Opflex](#), [OpenStack](#)
- **HCI / Software Defined Data Center & Networking**
- **VMware**
  - [NSX network virtualization](#), [Open vSwitch](#), [SimpliVity's OmniCube](#), [Nutanix](#)
- **Container and platform technologies**
  - [Docker software containers](#), [AWS Lambda](#), [Mesosphere](#), [Nginx](#), [Confluent](#)



your expert

Ajith NC



Time to get horizontal. To integrate the physical and virtual worlds, that is. With potentially every “thing” equipped with sensors, computing power, and network connectivity, you can envision a model—or a “digital twin”—of anything in your system. It will supply the business with a radically different perspective on how to develop, operate, monitor, and service physical assets. And it has the potential to open up entirely new revenue streams. With a new, true “infrastructure” that enables digital twins to be precise, trustworthy models of their physical equivalents, there is nothing that keeps the real and the IT worlds from getting really intimate.

### WHAT

- The Internet of Things (IoT) brings a rich infrastructure that connects physical assets to IT systems, often in real-time. This enables the building of virtual models of these assets that not only reflect their current situation, but can also predict their future state and their interactions with other assets.
- These Digital Twins pop up in all major industries, notably in manufacturing, where the Industry 4.0 initiative envisions the merger of operational technology and information technology.
- Producers of physical assets move to create software platforms to model and develop with Digital Twins.

### USE

- [Industry 4.0](#) describes a digital infrastructure in which machines, factories, supply chains, and products are equipped with real-time, “smart” IQ, which improves autonomy, productivity, and quality.
- GE Aviation built the [Configuration Data Exchange](#): a real-time dissemination and integration of digital twin configuration data and exchange of essential operations, maintenance, environmental and event information.
- “Smart” cities are increasing their IQ as well: in Auckland (NZ), sensors in the street lights monitor traffic, and by applying analytics to the collected data, the city is better positioned to manage traffic congestion.

### IMPACT

- Optimize the management and servicing of physical assets through predictive analytics, for example
- Improve business processes and activities that could benefit from a real-time connection to physical assets, for route optimization or customer experience
- Add value to physical products, by providing usage analytics to customers
- Create new business models through the [monetization of IoT](#)

### TECH

- **IoT and Digital Twin platforms**
  - [GE Predix](#) for the Industrial Internet, [IBM Watson IoT Platform](#), [Microsoft Azure IoT Suite](#), [C3 IoT Platform](#), [AWS IoT](#), [SAP IoT Platform](#), [Thingworkx](#)
- **Open Standards**
  - [Open Connectivity Foundation](#), The Open Group, [IoT Work Group](#)
- **IoT marketplaces and communities**
  - [IoT Consortium](#), [IoT Talent Consortium](#)



your expert

Nick Callanan

# BUILD, RELEASE, RUN, REPEAT



Enterprises are raving about DevOps, the agile and perfect fusion between IT Development and IT Operations, supercharging deployments with near-perfect quality. On a unified platform with a highly automated toolchain, DevOps teams develop applications, test, integrate, and package for deployment. They promote a continuous, uninterrupted flow, releasing many times a day without fail. It requires a thorough understanding of the components of a state-of-the-art DevOps platform and a disruptive change of culture within the organization. Build, release, run, repeat in the digital world...all before lunch. What if business could do that too?

### WHAT

- DevOps is a portmanteau of “Development” and “Operations.” It’s a concept that connects these two traditional IT silos throughout the development lifecycle, operating as a continuously delivering factory, able to release new application versions many times a day.
- On the one hand, it depends on a highly industrialized toolchain, automating as much as possible the activities of the entire software solutions lifecycle: a platform challenge for all involved.
- But above all, DevOps is a [seamless team effort](#) that brings together all needed IT disciplines in a high-productivity, multi-disciplinary team.

### USE

- A European bank transformed its IT department into dozens of autonomous DevOps teams, aiming to improve both business agility and to significantly decrease production errors in its digital applications.
- Netflix sets a shining example when it comes to next-generation solutions development. Their approach to DevOps leans on well-architected, platform-based tooling, but also on rigorous testing of their backend services, notably the database systems.
- Digital leaders such as Spotify and Etsy rely on a top-down, business-driven vision on DevOps, making sure the company fully embraces this new culture.

### IMPACT

- Increased speed to market, enabling the quick, initial release of high-quality Minimum Viable Products (MVPs), the ability to continually improve and expand it
- Higher productivity and fewer errors and unexpected bottlenecks due to a high degree of automation and an integrated, multi-disciplinary team
- Perfect approach to explore the new, digital world of cloud, mobile, and IoT solutions
- Helps the enterprise towards agile value delivery

### TECH

- **Collaboration tools**
  - [Slack](#), [Jira](#)
- **Configuration management tools**
  - [Puppet](#), [Chef](#), [Salt](#)
- **Deployment and lifecycle management tools**
  - [Jenkins](#), [ElasticBox](#), [Appdynamics](#), [Splunk for DevOps](#)
- **Integrated DevOps platforms**
  - [IBM BlueMix](#), [Microsoft Visual Studio](#), [AWS DevOps solutions](#)



your expert

Gunnar Menzel



The journey towards a cloud-based infrastructure nowadays seems like a walk in the park. But it's still far from standard. Different perspectives on privacy, security, scalability, costs, and manageability—to name just a few—can lead to wildly varying scenarios. They can involve multiple suppliers, multiple technologies, and a mix of public, private, and on-premise deployment. It's a hybrid world out there, and it could bring more complexity than desired. This is where “Service Orchestration” becomes crucial, providing the power of the cloud through a unified platform of simple, easy-to-consume services, no matter what route is chosen.

### WHAT

- Organizations have different needs centered around attributes such as security, privacy, integration, flexibility, costs, and standards. The near future of cloud delivery models will therefore involve a combination of public (agile and cost-effective) and private (secure and self-managed) deployment, possibly delivered by multiple providers. This hybrid cloud approach is potentially complex.
- An orchestration platform allows transparency and access to all cloud services through a single and central portal. With such an automated platform, the IT department can offer, manage, and charge-back current and future cloud services in the most efficient way.

### USE

- A leading global supplier in logistic services deployed a hybrid cloud solution underpinned by a professional Cloud Management Platform (CMP), with a focus on value through the orchestration and automation functions. The result was an integrated digital factory solution for cloud-native application development, enabled by a robust DevOps delivery approach.
- A Dutch distribution organization migrated its entire application landscape from an on-premise infrastructure to an off-premise, cloud-based IaaS and SaaS, all made possible by an industrialized migration factory. It delivered significant cost savings and increased agility.

### IMPACT

- Taking the full benefits of a cloud-based infrastructure (including agility, security, innovation, and cost reduction), without having to manage the unavoidable complexity of hybrid scenarios
- Transparency of what cloud services are actually being used by what business unit and for which purposes
- Self-service capabilities for the business side, improving speed to market and the alignment between business and IT

### TECH

- **Hybrid Cloud Orchestration Platforms**
  - [HPE Cloud Service Automation](#), [Microsoft Cloud Operations Management Suite](#), [IBM SoftLayer](#)
- **DevOps Tooling**
  - The typical components that underpin DevOps—such as [Chef](#), [Jenkins](#) and Docker—are key for cloud benefits
- **Open Source**
  - [OpenStack](#) is an open cloud platform that can diminish the dependency on specific cloud service providers



your expert

Thomas Sarrazin

## CECI N'EST PAS UNE INFRASTRUCTURE



Sounds like a pipedream. But the ultimately invisible infrastructure—no infrastructure—is certainly within reach. Many startups would agree with this idea, as they prefer asset-free business models for their next disruptive solutions anyway. Software-defined “everything,” radical automation, software containers, micro services, and the cloud are paving the way towards a catalog-based infrastructure, retail-style. Perhaps there is no catalog at all, just software. With software being continuously developed and deployed on an infrastructure that automatically adjusts, IT infrastructure can finally become the powerful utility it was destined to be: always available, just not noticeable. C’est tout.

### WHAT

- A new breed of providers focuses on providing measurable business outcomes for their clients’ consumers with turnkey infrastructures that are transparent and measurable in terms of value delivery.
- The mix of virtualization, software-defined networking and data centers, cloud, APIs, and software containers makes IT infrastructure a commodity that can be procured from a catalog of services.
- This can even evolve into “NoOps” and “serverless” computing, in which applications—or micro services—are instantly deployed on a cloud-based infrastructure that remains fully hidden from the developers.

### USE

- Startups that rely heavily on an event-based combination of IoT sensor reading, image processing, cognitive analytics, and social media functions, now by default favor a mix of third-party APIs, and “server-less” computing.
- Often, cloud-based development—even in full DevOps mode—involves building software, checking it into a source code management system, and deploying it to a web- or application server, scaling up and down when needed. With serverless computing platforms such as Azure Functions or OpenWhisk, it’s only a matter of uploading the code and watching it run, all within seconds.

### IMPACT

- Speed to digital value: no waiting for infrastructure procurement and installation, just on-demand usage
- Elastic scalability, varying with business volumes
- Full business focus on software-based solutions, rather than on the underlying infrastructure challenges
- Easy-to-start new initiatives, based on Minimum Viable Products (MVPs), no limits to scaling out, and small costs for failures
- Modest to no upfront IT infrastructure investments
- Ability to monetize social profile data in and outside the company

### TECH

- **Managed Data Center Services**
  - [Mesosphere](#), [Nutanix](#), [Qubole](#)
- **IT service marketplaces**
  - [AWS marketplace](#), [Microsoft Azure marketplace](#)
- **Platform-as-a-Service**
  - [Google App Engine / Firebase](#), [Salesforce App Cloud](#)
- **Serverless computing**
  - [AWS Lambda](#), [Google Cloud Functions](#), [Microsoft Azure Functions](#), [IBM OpenWhisk](#)



your expert

Gunnar Menzel



# Applications

Unleashed

# APPLICATIONS UNLEASHED



**Show me your application landscape and I'll tell you about your company. In a world of parallel, digital realities this is more than ever true.**

New solutions need to be delivered more rapidly and in various incarnations, as the very notion of “user interfaces” is rapidly melting away. And although minimum viable products are the norm – thanks to the start-up community – the quality of applications need to be enterprise-level, as the trust balance of the organization is at undiminished risk.

The new application landscape is thus ready to be unleashed in two different ways:

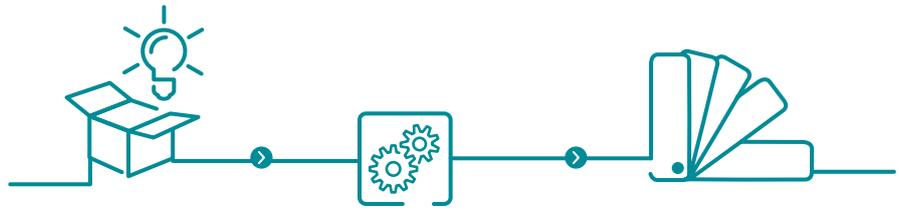
- Existing applications need to be rationalized, simplified, consolidated and decommissioned. One way or the other, what may have once been differentiating solutions for organizational growth, are now all too often petrified, budget-

devouring nuisances. Standard, industry-best-practice solutions from the cloud are a quick – though possibly disruptive – way to break the inertia. Loosely coupled layers on top of silo applications – through bots, APIs, robotic process automation – another.

- New applications are rapidly built and released in DevOps-style: in quick iterations between business and IT, leveraging micro-services, APIs, software containers, serverless computing and radically automated, high-productivity tools. Built-in analytics, cognitive / AI and smart contracts further add to both the corporate IQ and the trust balance of the enterprise.

Time to unleash the power.  
Applications Are Go!

# ALL IN THE CATALOG



Look no further, it's already in the catalog. The Cloud has brought a brand new generation of Software-as-a-Service (SaaS), mobile, and task-oriented applications. And they are not just off-the-shelf versions of software you used to build yourself. They typically contain industry best practices and new functions from which your impatient business can immediately benefit. All of this with a top-of-the-bill user experience, flexible APIs, and mobile-first apps. Even your legacy applications can be turned into easy-to-access catalog items. A growing catalog of next-generation applications is waiting to kick-start your digital journey. Open it up today and start exploring!

### WHAT

- SaaS applications: born-in-the-cloud applications that deliver innovative, next-generation business functionality in areas such as ERP, CRM, SRM, and HRM.
- Task-oriented applications: applications that serve very specific needs such as expenses, project management, and collaboration.
- App Store-style navigation and availability of business applications and application services.
- APIs and web services provide an easy way to create business access to application functions, not only for next generation cloud applications but also for catalog-based access to existing, legacy applications.

### USE

- While re-implementing an ERP system, a large manufacturer decided not to go for the standard "one ERP" approach, but split the functionality in cataloged services to provide more speed and agility for the business.
- A European high tech company changed its formerly requirements-driven approach to defining value cases and impact assessment to catalog-based cloud applications, speeding up both selection and implementation.

### IMPACT

- Quick access to next-generation business functionality without large, upfront investments
- Standardization while still providing agility and autonomy for the business through APIs
- Mixing core enterprise applications with agile and catalog-based solutions
- Speed up application selection and implementation by applying a catalog perspective instead of requirements specification

### TECH

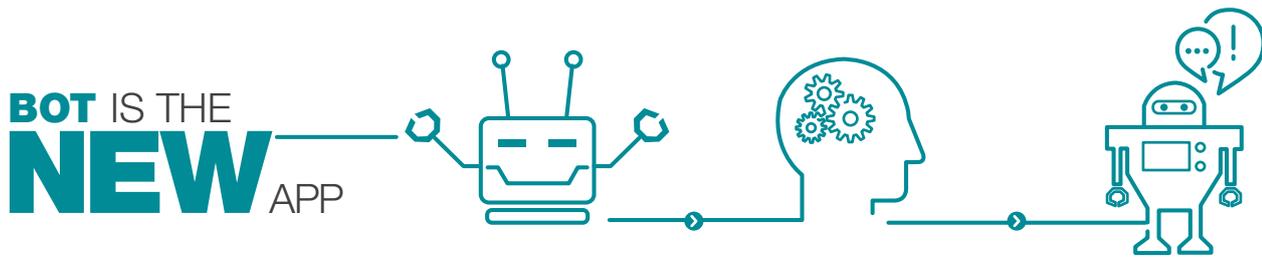
- **SaaS solutions**
  - CRM: [Salesforce](#)
  - HRM: [Workday](#), [Successfactors](#)
  - ERP: [Netsuite](#), [Kenandy](#)
- **Task-oriented applications**
  - [Concur](#), [Asana](#), [Trello](#), [Yammer](#)
- **App stores**
  - [Salesforce AppExchange](#), [SAP App Center](#), [Microsoft Azure Marketplace](#)



your expert

Stephen Brown

## APPLICATIONS UNLEASHED



Say what? Every day, new and exciting applications pop up that don't look like traditional applications. Actually, sometimes you can't even see them at all. Building on powerful Artificial Intelligence (AI), it's just a matter of asking a question in a natural language and an application service will respond. Application bots may involve spoken dialogue or messages and emoticons. Its technological capabilities can seriously diminish the number of applications on a desktop or a mobile device and reduce the number of applications you need to manage. Close your Windows: the Bots are here.

### WHAT

- Virtual assistants apply Artificial Intelligence to recognize and produce natural language and act as a front-end to application services. They can be used from the desktop, the smart phone, the car, or through a dedicated device such as Amazon's Alexa.
- Messaging apps apply similar technology to recognize and produce text and even emoticons; they can be integrated with existing chat platforms or built as stand-alone applications.
- The application services needed typically stay "under the hood" and require back-office applications to be redesigned as micro services and APIs.

### USE

- With Odigo's Voice App, customers can browse, coordinate, and perform services. By using speech analytics, the emotional state of a caller can also be identified and acted upon.
- Several banks now allow their clients to use the virtual assistant of their phone to conduct financial transactions.
- Using the Chinese WeChat messenger interface, 200 million customers already can pay a bill on the spot, transfer money, book a restaurant table, order a taxi, or collaborate with colleagues.

### IMPACT

- Opportunities for better, more timely, and more efficient customer service as well as employee productivity
- Obtaining better understanding of customer needs and sentiments
- Better leverage and use of back-office (legacy) applications
- Opportunities to simplify and rationalize the existing application landscape

### TECH

- **Customer Service interaction**
  - [Capgemini Odigo](#), [IPSoft Amelia](#)
- **Voice assistant platforms**
  - [Microsoft Cortana](#), [Apple Siri](#), [Amazon Alexa](#)
- **Voice assistant devices**
  - [Amazon Echo](#), [Google Home](#)
- **Text assistant platforms**
  - [WeChat Open Platform](#), [Microsoft Bot Framework](#), [Facebook Messenger Platform](#)



your expert

Frank Wammes

### KICK START MY APP



Blessed with a motley crew of brilliant ideas for killer apps? First of all, you'll need the power to deliver new disruptive ideas to the market blazingly fast and with the right quality. Classic software delivery based on manual work and more mythical man months will only get you so far. To leapfrog, you must automate. Radically. Next to industrializing infrastructure delivery, it's a matter of fully automated, vanguard software development, deployment, and management pipelines. These cover the full applications lifecycle, even monitoring the actual business performance of applications and automatically taking corrective actions. Put your app engines on and get ready to rock!

### WHAT

- DevOps-style continuous delivery is based on multi-disciplinary teams that seamlessly work together; it also builds on highly automated “tool trains” often based on open source technology that cover the entire applications lifecycle in the blink of an eye.
- Systems that are purposely architected on the principles of speed, safety, and scalability are stable and yet can accommodate rapid, iterative change.
- Automation can be extended to monitoring the actual business performance of the application, applying Artificial Intelligence to detect and correct inefficiency and anomalies without human intervention.

### USE

- An industrial manufacturer increased its IT process efficiency by over 30% by implementing end-to-end process automation, also covering data integration and the verification process.
- A European bank drastically moved to DevOps-style, highly automated software delivery, changing its image of error-plagued laggard to innovation leader.
- A large stock exchange replaced its incoherent set of application management tools with an end-to-end, automated suite; it enabled them to fluently migrate their application landscape to the public cloud without the danger of failing performance and poor quality results.

### IMPACT

- Rapid delivery of potentially disruptive solutions to the market, starting from Minimum Viable Products that can quickly and iteratively be extended and improved
- Lower cost of software development and maintenance, combined with higher software quality
- Optimization of application performance and opportunities to proactively monitor and improve the business impact of software

### TECH

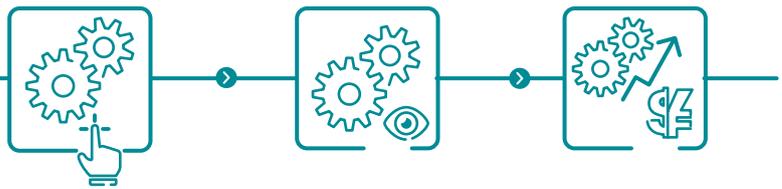
- **Delivery and release automation and DevOps**
  - [Xebialabs](#), [Spinnaker](#), [Concourse](#), [LambdaCD](#), [IBM Bluemix](#), [Chef](#), [Puppet](#)
- **Process automation:**
  - [Cortex](#), [Automio](#), [Ipssoft](#)
- **Applications Monitoring and Management:**
  - [AppDynamics](#), [Splunk](#), [NewRelic](#)



your expert

Frank Wammes

# API ECONOMY



May the best API win. Unleash the power of your applications portfolio through easy-to-use, standardized interfaces to application services. It will allow both the business and IT sides to quickly build flexible solutions that feel like their own even if they are not. And by exposing your carefully managed API catalog to the outside world, it doesn't only open up your business in new ways to customers and partners. It might also give way to a platform for innovative ideas and solutions that you never envisioned yourself. Come to think of it, you may want to intimately know and use the APIs of others as well. Your digital breakthrough may be just one API away.

## WHAT

- An application programming interface (API) provides standardized, [open access](#) to an application service or a data set; it is decoupled from the actual user interface of the application.
- A set of subroutine definitions, protocols, and tools for building application software, APIs provide the building blocks for developers to compose and enrich their application leveraging data from multiple sources. With more and more companies opening their data sources through means of APIs, we no longer have to build all our services.
- APIs can be managed as a product through API management platforms; they take care of versioning, scalability, quality, and monitoring of actual use.
- APIs can be built on top of existing applications in order to provide more flexible access; new applications typically come by default with a set of accompanying APIs.
- APIs can be exchanged with the outside world.

## USE

- Of [Salesforce's](#) daily use of core application services, more than 70% is based on API-usage rather than through the browser user interface.
- The New Zealand Post provides a special [developer resource center](#) that enables its customers and partners to implement digital solutions by integrating their applications with the New Zealand Post's APIs.
- A European tax agency rebuilt its entire core system as a set of micro services and APIs, enabling any flexible solution to be developed on top of it.
- IBM's Watson's [Cognitive capabilities](#) are exclusively available through APIs.

## IMPACT

- Simplification of the application portfolio, as well as better and more flexible access to existing and new application services by both business and IT sides
- Monetizing and enriching application services through the publication of APIs to customers, partners, and external developers
- Leveraging external API catalogs for ready-to-use application functionality and very specific IT services

## TECH

- **Dedicated API management platforms**
  - [WSO2](#), [Kong \(open source\)](#), Tyk, Google [Apigee](#), [Mulesoft](#), [Microsoft Azure Api Management](#), [IBM API Connect](#), [Dell Boomi API management](#), [CA API management](#), [AWS API Gateway](#)
- **API management open standards**
  - The Open API Initiative
- **API marketplaces**
  - [ProgrammableWeb](#), [AWS Marketplace](#)



your expert

Joakim Lindbom

### APP MAKER

# MOVEMENT



Bring Your Own Device? So last year. How about bringing your own applications? Just like the Maker Movement has inspired individuals to create their own 3D objects and robots, it is now easier than ever to construct your own applications and not necessarily by learning how to code. It is done by using powerful, visual DIY tools that leverage API catalogs and prebuilt template galleries to the fullest extent. It gets even better when you collaborate with peers. Sometimes, it's really just a matter of gluing together a few web services. And AI support is on its way to making things even simpler, more effective, and automated. The time is ripe for app democracy. Make your move.

## WHAT

- Powerful DIY platforms are available for “citizen” application development, although IT people may be equally enthusiastic about their productivity and ease-of-use.
- These platforms depend on the availability of robust, enterprise-scale API and web service catalogs (both internal and external), open data sets, and tested and proven template galleries and “plug-ins.”
- Sharing of best practices and collaboratively building on each other’s solutions is a crucial success driver.
- AI will quickly assist in creating even more powerful, DIY applications.

## USE

- An online optical products retailer chose to custom-build its entire stack of core applications rapidly with its senior managers on the Mendix platform, rather than implementing a more expensive, less flexible ERP system.
- Individuals from all over the world routinely create and exchange “applets” on IFTTT.com, based on thousands of web services that give access to the world’s most popular applications and data collections.
- The [WordPress](#) blogging platform provides templates and a plug-in system for the blogger to create serious, compelling websites.

## IMPACT

- Increased application development productivity, on both the business and IT sides
- A much better alignment between the IT and business sides through personally involved and committed “citizen” application developers, and the open, digital platforms that IT supplies to help these citizens along
- More innovative and higher-quality business-facing applications
- Enterprise robustness combined with agile solutions

## TECH

- **High productivity development tools**
  - [Google App Maker](#), [Mendix](#), [OutSystems](#), [Microsoft PowerApps](#), [Salesforce Lightning App Builder](#)
- **Visual web service and API composers**
  - [If This Then That](#), [Apian for Citizen Integrators](#), [Microsoft Flow](#)
- **Maker Movement**
  - [The Maker Movement Manifesto](#)



your expert

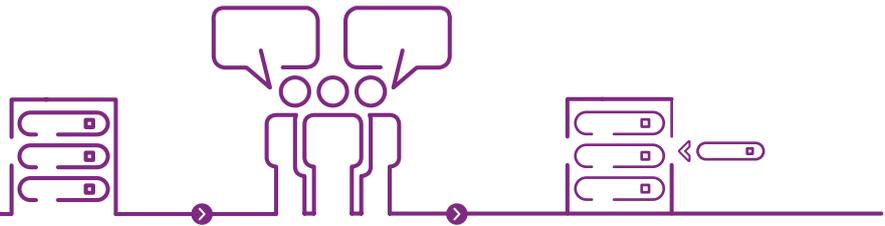
Ron Tolido



**Thriving**  
**on** Data



# THRIVING ON DATA



**The corporate IQ depends on data. Data from many different sources – outside and inside the enterprise, people, things – in all sort of structures or unstructures, in hardly conceivable volumes, coming in at yet unseen speeds.**

It's one thing to ingest all that data and store it for later use. Turning it into insights that actually change a business, is the better challenge.

Technology innovations from the open source community have created an unrestrained enthusiasm for what the entire world has come to know as Big Data. And it's not only about data science and next-generation algorithms. Combine it in a platform with cloud delivery, powerful self-service tools, advanced visualization, fully automated data pipelines plus AI-support, and Business Intelligence – by some considered as classic – gets an entirely new, cool life. It will provide more real value, closer to the business than ever before.

Oh, and it's about data science and next generation algorithms too. An eclectic catalog of high-performance analytics will soon be one of the most valuable enterprise assets, whether it's built in house or carefully acquired from elsewhere.

But personal data, as insightful as it potentially can be, has all it takes to devastate the enterprise trust balance. Creating data-driven solutions through privacy by design is at the foundation of the corporate Maslow pyramid.

Then – of course – there is the augmentation for our corporate IQ through deep learning, artificial intelligence and cognitive systems. While most enterprises are only scratching the surface, the collaboration between man and machine does not only promise more intellect in literally every activity carried out, every solution deployed, every service delivered; it will fundamentally change business and eventually society.

Hopefully for the better. After all, data is to be thrived on.

# MY DATA IS Bigger THAN YOURS



Yes, data is bigger than ever...and it's not just because technology supports you in storing and analyzing data in unparalleled volumes, in any structure, from any source, and at any given time, although that certainly helps. The real breakthrough of the new data landscape is the ability to insert actionable insights into literally any business activity along every step of the way, with the very best next move. It's more than a business on steroids; it's a business on insights. Envision it from before the very first contacts with potential customers, to way beyond the finest details of the final, operational delivery. Insights are the key to boosting corporate IQ...and that's huge indeed.

### WHAT

- The new data landscape combines low-cost, huge-volume data storage and access with cloud-driven flexibility and scalability alongside raw, real-time analytical and visualization power. Many innovations come from open source projects and startups, but industry leaders are quickly catching up, creating a new normal.
- Data can be made available as actionable insights, not just as a separate report but right in the middle of a process flow, a mobile application, or through an API.
- This invites a fundamental redesign of business processes and even entire business models, putting insights from data at the core of digital change.

### USE

- A large European tax agency migrated its entire legacy data warehouse to an open source-based, next-generation data platform, saving considerable costs while increasing delivery speed and gaining access to innovative Big Data capabilities.
- A Japanese insurance company made an insight-driven, cloud-based sales portal available to its more than 100,000 independent agents, supporting their commercial activities with targeted next best actions.
- Media company Entravision used the fine-grained customer behavior data it was collecting to set up [Luminar](#), an entirely new analytics business.

### IMPACT

- Leverage next-gen technologies to simplify and rationalize the existing data landscape, saving costs while increasing agility, speed, and business buy-in.
- Infuse processes, activities, and applications with real-time actionable insights, in turn improving decision-making, efficiency, client intimacy, and ultimately business performance...all with a higher enterprise IQ.
- Explore new revenue streams and breakthrough business models, leveraging data as the key asset.

### TECH

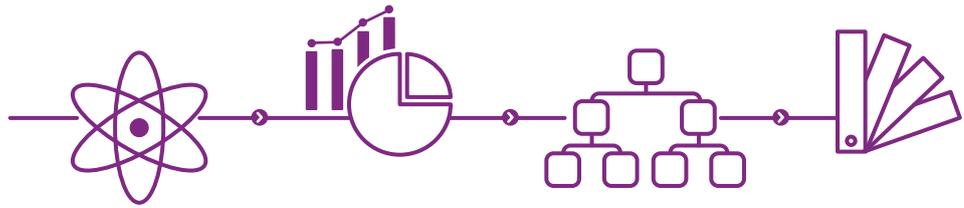
- **Industry leaders' next generation data platforms**
  - [IBM Watson Data Platform](#), [SAS Viya](#), Microsoft [Cortana Intelligence Suite](#), [SAP BW/4HANA](#) and [HANA VORA](#), [Cloudera EDH](#), [Hortonworks HDF and HDP](#), [Datastax Enterprise](#)
- **Integrated insights**
  - [Salesforce Einstein](#), [Oracle Adaptive Intelligent Applications](#), [Pegasystems Customer Decision Hub](#), [SAP Clea](#)
- **Open Source and standards ecosystem**
  - Open Data Platform Initiative ([ODPi](#))



your expert

Anne-Laure Thieullent

# YOU DO THE MATH



We know, we know. Data science isn't only about math. However, the future of your business lies in algorithms. It will rely on these - leveraging internal and external data - to make better-informed decisions, predict the future, and even prescribe what should be done to achieve objectives. An eclectic catalogue of algorithms can be the most differentiating business asset, whether pertaining to the customer experience, internal operations, human resources, risk, fraud, or "things." And there is a quickly growing market of sector and domain algorithms out there as well, algorithms that are ready to be used right out of the box. So you don't need to science your way out of this all on your own.

### WHAT

- An innovative push from the open source world has accelerated the development of advanced analytics and algorithms, shifting from insights that describe or (at best) diagnose, to predictive and even prescriptive algorithms.
- With more – diverse – data available from internal and especially external sources, findings are corroborated, rather than depend on guesswork, and thus become much more accurate.
- A catalog of these algorithms, if made available to the business, can make a decisive difference in business performance and competitiveness.
- Off-the-shelf analytics are a quick, viable alternative to building algorithms yourself; this market is rapidly growing

### USE

- A life science company uses weather and social data to refine forecasts, streamlining their supply chain.
- Unilever actively analyzes social media to refine campaigns, decide on marketing strategies and protect brands.
- A global insurance company develops analytical models to analyze external media for events that could affect their customers, and hence their exposures.
- Daimler China analyzes internal and external data to accurately predict arrival of a car at the dealer, right from its arrival at the port.

### IMPACT

- Getting more new value from data from various – often external – sources, beyond the traditional business intelligence benefits
- A better understanding of future customer behavior, optimizing the supply chain, shortening delivery routes, saving energy, identifying the right personnel for the job, predicting health issues, tax fraud and machine defects
- Modeling, simulating, and deciding around alternative business scenarios and key outcomes to decide the next best action

### TECH

- **Open Source ecosystem**
  - [Hadoop](#), [Spark](#), [R project](#), [Cloudera](#), [Hortonworks](#)
- **Advanced Analytics platforms**
  - [SAS Viya](#), [Microsoft Cortana Intelligence Suite](#), [IBM Analytics](#), [Knime](#), [RiverLogic prescriptive analytics](#), [GE Predix](#), [C3 analytics](#)
- **Analytics solutions, marketplaces, and communities**
  - [Kaggle data science crowdsourcing](#), [Microsoft TDSP](#),  
– [Alteryx analytics marketplace](#), [Data Ventures](#), [BlueYonder](#)



your expert

**Mamatha Upadhyaya**

# AT YOUR SERVICE



“Can I help you?” Every businessperson nowadays should be a bit of a data expert, perhaps even a “citizen” data scientist. The best insights are created in close proximity to the business and to do that that, data must be discovered, prepared, analyzed, and visualized by businesspeople themselves. It requires a highly automated data pipeline that gives agile access to the right data, while ensuring security, privacy, and quality. It also requires easy-to-use, self-service tools that power a business to take data matters into its own hands. Introducing the Data Concierge: an intelligent, one-stop shop for data. You’re welcome!

## WHAT

- The days of a six-month turnaround for a data warehouse requirement are gone. Today’s insights need to adapt to the latest challenges and information, and this means achieving “DatOps” delivery, which allows updates to be delivered quickly and continuously.
- This is driven by an automated, factory-style process to ingest, select, transform, and prepare data.
- As Excel remains the preferred business data tool, its quality of individual insight at speed needs to be trumped by next generation DIY BI and analytics tools that identify and effortlessly connect to the data pipeline.
- AI will assist DIY business users with these activities.

## USE

- A consumer products company created “data science on demand” that enables the business to work with data experts on specific challenges and rapidly have the first proof of solutions—then production versions—to reap early business benefits.
- A financial institution turned its data ingestion into a highly industrialized, automated, managed service where new data and insights are made available from months down to just days.
- A US airline supplied business users with intuitive self service data tools, creating much more data exploration, innovation, and a true “self service movement.”

## IMPACT

- Cost effective production of BI and analytics results, reducing manual effort and increasing quality
- Speedier availability of new insights for the business
- Better access from the business to more relevant data from various internal and external sources
- Increasing cultural and practical awareness on the business side of the potential for turning data into insights
- Improvement of business and IT alignment, with the data platform and data concierge concept being pivotal

## TECH

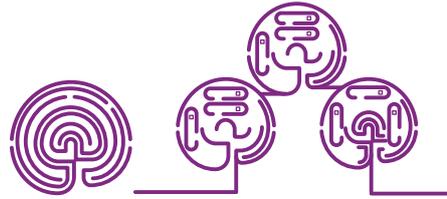
- **Continuous, agile delivery**
  - [Jenkins](#), [Bamboo](#), [Git](#), [Subversion](#), [Puppet](#)
- **Data pipeline technologies**
  - [Alteryx](#), [Informatica Big Data Management](#), [Talend](#), [AWS Data Pipe Line](#), [Microsoft Data Factory](#), [Hortonworks Data Platform](#), [Cloudera EDH](#)
- **Self service BI and analytics tools**
  - [Tableau](#), [IBM Watson Analytics](#), [Microsoft Power BI](#), [SAS Visual Analytics](#), [Talend Data Prep](#)



your expert

Goutham Belliappa

# DATA APART TOGETHER



The single source of truth in corporate data is like the Holy Grail: great to pursue yet destined not to be found. Therefore, organizations must adapt to a federated business reality. As a result, many different sources, uses, and perspectives of data exist both inside and outside the corporate perimeter. Enter meta-data management, master data management, and federated analytics. They deliver integrated yet powerful access to data spread across multiple data stores. Governance is thus more agile and closer to the business than ever before. It complements the crucial quest for trustworthiness and unobstructed collaboration on data. The best of both worlds, really.

### WHAT

- The need to execute not just on internal data but with external partners means that more and more data needs to be connected and collaborated on in a highly federative way.
- Master data management and the cross-reference it supplies between systems is crucial to ensure that connections between data can be both navigated and managed.
- It does not require an undisputed “golden record,” just the minimum to enable people and systems to connect the dots: quality can wait, but collaboration cannot. It must come first.
- Next to MDM, meta-data management, business process management, increasingly powerful DIY exploration, data virtualization and “data tribe” tools all help to thrive on federation.

### USE

- A leader in healthcare and life science wanted to open up distributed data for self-service analytics. It created a data catalog that automatically inventoried every field of data from several data lakes so that business analysts could maximize their time to value.
- With product information residing in multiple systems with different standards definitions across various regions, a global beauty products company spent way too much time finding and aligning data. Through the implementation of federated MDM, it reestablished its grip on mastering complexity while freeing up time to actually work on insights-driven product management and marketing.

### IMPACT

- Business advantage is built on insights from data: wherever it is kept, by whomever, in whatever way
- Getting the right information means knowing what can be obtained: what customer information lives in which lakes and what product information is related to it
- Enabling internal and external data lakes to collaborate to provide better business outcomes
- Creating quick results without lengthy, often unrealistic unification and standardization efforts

### TECH

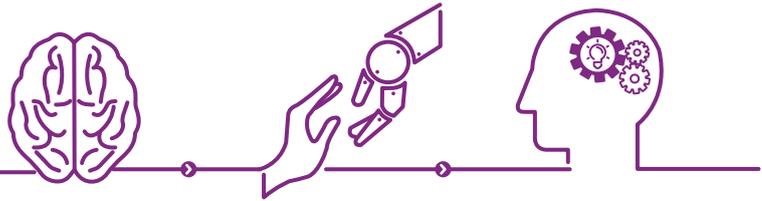
- **Master Data Management**
  - [IBM InfoSphere Big Match](#), Informatica [Big Data Relationship Manager](#), Talend [MDM](#), SAP [Master Data Governance](#)
- **Data Exploration**
  - Informatica [Intelligent Data Lake](#), Cloudera [Navigator](#), [Apache Atlas](#), Waterline [automated data fingerprinting](#), [Microsoft Data Catalog](#)
- **Data Virtualization**
  - [Datometry](#) adaptive data virtualization, [Cisco data virtualization platform](#), [Informatica data virtualization](#), [Denodo data virtualization](#)



your expert

Steve Jones

# MAX MACHINA



No need to race against the machine. Breakthroughs in deep learning and raw computing power are fueling the renaissance of AI and Machine Intelligence, resulting in spectacular progress in the areas of audio, video, image, and text processing. These are human-like, cognitive capabilities, but AI can also absorb and reason around complex data in unearthly ways, surpassing what the human brain can deal with. As such, the mission of AI is to augment your personal and business world. Add AI to an app, a process, a product, a service, or even a thing, and it will quite likely grow both smarter and better. You decide how fast and to what extent AI will do this. After all, these are still “machines” and they’ll do what you told them.

### WHAT

- Artificial (or Machine) intelligence is progressing rapidly due to increased computing power and superior software, notably in the area of neural networks-based deep learning; AI is often only an API call or web service away.
- AI is best illustrated by its cognitive capabilities coupled with human-like capabilities such as image recognition, understanding, speech production, complex text analysis, and—most notably—gaming strategy.
- Pattern matching also enables split-second, “fuzzy” decision making based on huge amounts of parallel data.
- AI works best by collaborating with humans rather than replacing them; in either case, ethical dilemmas will surface.

### USE

- Capgemini brings more IQ to its own (BPO) business services by combining an automation of process steps with AI-enabled [analysis and resolution of service requests](#). It also uses cognitive capabilities to facilitate complex contract management, optimize people matching for assignments, and drastically speed up testing.
- A large financial clearing house uses cognitive natural language capabilities to turn piles of unstructured financial brochures into 80 well-defined data points.
- AI-powered drones combine image recognition and supervised learning to automatically count and control stocks in large warehouses.

### IMPACT

- Cost effectiveness, improved productivity, and higher quality through “smart” automation of human tasks
- Capturing and leveraging collective knowledge as well as decreasing the dependency on undocumented, individual expertise and experience
- Adding “IQ” to products, services, and devices or even “things,” making them more conversational, autonomous, and accurate
- Ultimately enabling entirely new business models

### TECH

- **AI and Machine Intelligence platforms**
  - [AWS AI Services](#), [IBM Watson Cognitive](#), [Microsoft Cognitive Services](#), [Google TensorFlow](#), [Loop AI Labs](#), [Salesforce Einstein](#), [Oracle Adaptive Intelligent Applications](#), [SAP Clea](#)
- **AI solutions**
  - [RAVN](#), [Celaton](#), [IBM Watson Knowledge Studio](#), [Narrative Science natural language](#)
- **AI (open source) platforms**
  - [Facebook AI Research](#), [OpenAI Gym](#)



your expert

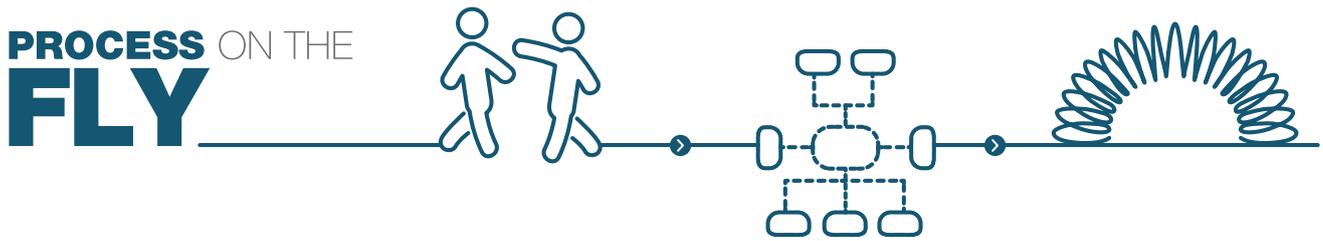
Ron Tolido



# Process

on the fly





**As we all know, a high IQ is not always a recipe for crushing success. In the end, it's all about execution. Corporate speed depends on the ability to turn insights into action, to quickly respond to events, to overcome business silos, to rapidly change our ways if circumstance so dictate.**

This is where process management technologies deliver. Having consistently caught less of the shine than its complementing concept of Thriving on Data (ever heard of Big Process?), breakthroughs in particularly Robot Process Automation have now put the notion of Process on the Fly center stage.

As there are many different flavors of process that can be supported and enable by technology, organizations can apply a range of options to support stable, predictable workflows, automated sequences of application screen interactions, ad hoc configurable responses to spontaneous events,

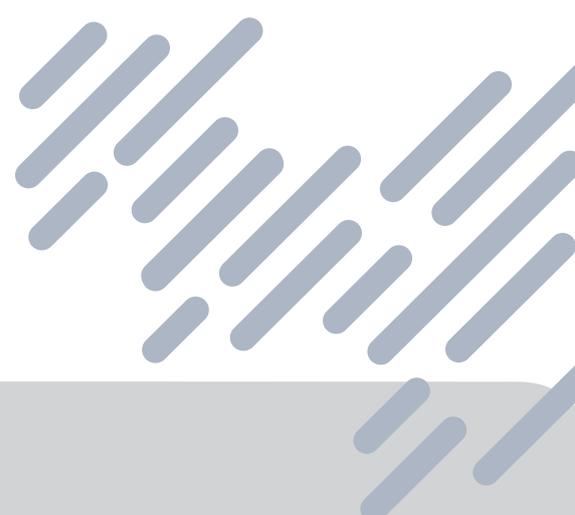
and even no processes at all. Delivered as a crucial component of a next-generation Business IT platform, process technologies bring new impulses to literally any place in the organization that involves processes.

As a certified silo buster, it bridges gaps between corporate – or inter-corporate – systems without intruding them.

As a next-generation solution builder, it's the glue that binds together microservices and APIs into something that we might have called “applications” in the past.

Combined with AI and cognitive systems, it will make business process more and more intelligent, boosting corporate performance and creating better places to work.

Not exactly a May fly.



# SHADES OF PROCESS



State-of-the-art business process platforms make it possible to support, define, run, and manage processes in many different ways. Forget about carving process definitions in stone. Nowadays, at least 50 different flavors of agility can be added to your processes. This ranges from classic, pre-defined, workflow-styled process integration via document-based interaction, to robotic automation, dynamic rules, and policy-based process choreography. When guided by dynamic decision-making and AI support, these processes become smarter too, providing the power to act and react in real-time. Quite the seductive perspective.

## WHAT

- The portfolio of leading process management suppliers supports processes in many different degrees of agility and manageability. These platforms support modeling processes, then run them through automated support, and monitor, manage, and improve them based on collected process metrics.
- They often rely on access to applications and data through web services and APIs, although non-intrusive (“robotic”) access is a good possibility as well.
- By bringing in embedded analytics and AI or cognitive capabilities, process platforms can learn from both the human and automated experience and continue to improve.

## USE

- Building on [Dataiku](#), a leading freight broker improved their core product’s accuracy and efficiency while establishing a data-driven spirit within the entire company. This move has resulted in several competitive advantages, such as increased customer loyalty and a much-improved speed limit correction process.
- A European bank required robust platforms, security, audit trails, strong authentication services, and many other features that [Convertigo](#) easily provided.
- A German Telco utilized the [Pega](#) platform to create a 360° customer view across all digital channels while drastically simplifying its daily operations.

## IMPACT

- Increased process productivity and effectiveness by automating human tasks and decision-making
- “LEAN”-style continuous process and quality improvement
- Augmented process agility and flexibility that leads to quickly creating new processes that might support a new product, service, merger, or external partnership
- The power and foresight to quickly respond to customer-related events and needs, crossing process boundaries both inside and outside the organization

## TECH

- **Business process management platforms**
  - [Pega platform](#), [IBM Business Process Manager](#), [SAP Process Management and Integration](#), [JBPM open source](#), [Activiti open source](#)
- **Do-it-yourself business process tools**
  - [Salesforce Process Builder](#), [Microsoft Flow](#)
- **Customer experience platforms**
  - [Sitecore omni-channel suite](#), [Bitrix social collaboration suite](#)



your expert

Mirek Bartecki

# NO PROCESS



The best process? Consider no process at all. As the need for radical business agility continues to accelerate, established business process management tools will only bring you so far in terms of their ability to respond to complex customer events in real-time. Driven by context-sensitive and analytical insights and AI, fixed and inflexible processes can be replaced by powerful reasoning systems. These systems fluidly adjust to whatever situation occurs by using rules and algorithms to decide the next best action and employing the precise resources available to swarm the case at hand. It provides you with an enterprise heartbeat locked on digital speed.

## WHAT

- Dynamic case management systems capture and process business events across process silos, providing end-to-end intelligence and optimized outcomes on a case-by-case basis.
- Business Rules Management System (BRMS) solutions externalize decision logic from applications, allowing both IT and business experts to define and manage decision logic. This logic is then executed by Business Rule Engine (BRE) systems.
- Complex Event Processing tools analyze the context stream—or “event cloud”— around an event that occurs in order to identify the most optimal response and action.

## USE

- A European tax agency used a business rules management system to extract the logic around computing benefits from its core applications in order to adapt more quickly to changing regulations.
- A government organization used a case management system both to optimize the allocation of its scarce personnel resources to new unemployment cases and to track progress and outcomes.
- A global bank utilized a complex business event processing platform to ensure a consistent, real-time customer experience across multiple digital channels with quickly evolving products in various regions.

## IMPACT

- Customer-centric decision-making
- Identifying highly personalized next best actions in real-time
- Split-second responses to high-volume data streams and events in real-time, in particular around the Internet of Things and digital customer channels
- Optimizing scarce enterprise resources to deliver the best outcome for every case
- Highly flexible business logic that can be defined and adapted on the fly, in or very near to the business

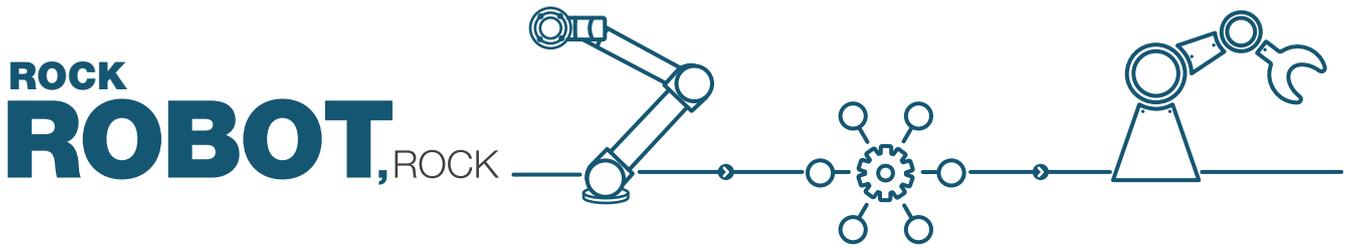
## TECH

- **Case Management**
  - [Appian case management](#), [Pega case management](#), [IBM Case Manager](#).
- **Business Rules and Decision Management**
  - [Drools open source](#), [Oracle Policy Automation](#), [Pega Customer Decision Hub](#)
- **Complex Event processing**
  - [SAP Complex Event Processing](#), [IBM Infosphere](#), [Tibco Business Events](#), [Informatica RulePoint](#)



your expert

Fernand Khouzakoun



The robots are among us...though they sure don't look like robots. Rather, they emerge as powerful software solutions that target the mechanistic and repetitive processes of the human workforce, typically interacting with screens and systems. Robotic Process Automation looks at this interaction and aims to automate it as much as possible. The mission of RPA is not to fix underlying technical problems or flawed application logic. It is simply to maximize the efficiency of process execution, in spite of inherent shortfalls. So while they may not be the shiny robots that walk around, carry your stuff, and do your household chores, they sure will speed up your routine business activities, 24/7/365. Robots rock.

### WHAT

- Robotic Process Automation (RPA) utilizes a software system to replicate the actions of a human worker interacting with the user interface of a computer system.
- This “software robot” can be trained to use the user interface in exactly the same way as a human would, virtually initiating input actions (such as mouse clicks and keyboard input), interpreting display output, and taking automated actions according to pre-defined rules.
- Additional RPA management software manages resource allocation, systems usage and compliance.
- RPA solutions typically carry out their actions much faster (and more reliably) than their human counterparts.

### USE

- From business processes in finance, HR, and supply chains through to technical and service management processes in IT, Capgemini’s business services (BPO) global practice deployed RPA technology in order to generate new operational efficiencies for their clients while increasing price-competitiveness.
- A large services organization automated its order management process with RPA, covering the work of 800 FTEs by 50 software robots. The average handle time was reduced from 30 minutes to ten and an 80% cost reduction led to a return on investment within six months.

### IMPACT

- A faster and potentially more reliable execution of routine human tasks carried out across a multitude of different applications, saving money, time, and resources
- Repaired application integration and cross-silo organization issues that are typically too small or too costly to address within the core application systems
- Due to its non-invasive nature—no applications need to be changed—benefits are delivered quickly, effectively, and without additional risk.

### TECH

- **Robotic Process Automation platforms:**
  - <http://www.uipath.com/>, [Automation Anywhere cognitive robotic process automation](#), [Blue Prism robotic process automation](#), [Jacada Integration and Automation](#), [Kofax smart process applications](#), [Nice robotic process automation](#), [Pega robotic automation and workforce intelligence suite](#), [UiPath robotic process automation](#), [WorkFusion intelligent automation](#)



your expert

Lee Beardmore



Your aging silo applications support disconnected silo processes. The souls of frustrated business users haunt you day and night in the IT neighborhood. Who you gonna call? Rebuilding core applications containing years of investment is complex, disruptive, risky, and expensive. But still, opening up access to applications, departments, and even the outside world is within reach. Business Process technologies allow you to bridge the gap between systems without intruding upon them. Create a silo-busting platform for flexible and agile process layers on top of disconnected applications and create early, compelling benefits. Nothing to be scared of after all.

**WHAT**

- Robotic Process Automation (RPA) platforms enable the automated integration of multiple siloed applications from the perspective of a human worker without changing any of the affected systems.
- Business Process Management tools offer the capability to invoke various application services offered by different applications as part of a modeled and managed process flow.
- APIs and web services can be created on top of disconnected applications to expose crucial application functions to process modeling and system development tools.

**USE**

- A large private hire company, transporting more than 10 million passengers each year, needed to be able to improve reaction times to changing customer behavior and preferences. To achieve this, it leveraged [MuleSoft](#) to securely redefine their data and application services to support global expansion, enabling partners to embed private hire services into their own processes and services.
- An insurance company used Robot Process Automation to quickly and safely integrate the core systems and processes of an acquired company, creating end-to-end processes that connected both companies.

**IMPACT**

- Sustaining the lifespan of aging or dysfunctional applications without costly and risky applications management activities
- Connecting siloed applications inside and outside the organization to create new, outside-in, end-to-end processes to serve the customers' and companies' digital needs
- Providing a high level of process flexibility and agility without intruding on the affected application systems

**TECH**

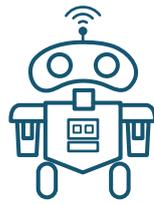
- **API and Web Services Management**
  - [Mulesoft API management platform](#), [Google Apigee](#), [IBM Connective & Integration](#)
- **Robotic Process Automation**
  - [Automation Anywhere](#), [Blue Prism](#), [UiPath](#), [Pega Robotic automation and workforce intelligence suite](#)
- **Business Process Management**
  - [Oracle BPM](#), [IBM Intelligent BPM](#), [Pega BPM & Case Management](#)



your expert

Mirek Bartecki

# WORK THAT MACHINE



'Taking the robot out of the human' is a powerful first step in applying automation to work processes. But what if we bring machine intelligence into the equation? Cognitive systems can mimic human behavior; this is visible in their mastery of natural language and their understanding of audio, video and images. Deep learning enable these systems to observe processes and their broader context, detecting complex patterns that humans might not be able to see or absorb. They then continuously learn from applying these patterns to daily practice, augmenting the workplace with ever increasing, automated intelligence. Such a symbiotic relationship between man and machine changes the way we work, get ourselves organized, and do business.

## WHAT

- Cognitive systems can master the typical human ways of communicating and analyzing through, for example, natural language processing and the ability to recognize images or analyze video footage. These capabilities can enhance existing processes, either by augmenting human work or by replacing parts of it.
- AI has used (unsupervised) deep learning to win games—such as Go—just by observing how it is played and won, without even knowing the rules. The same technology can be applied to processes by learning from the way humans do their work and then providing them with automated, highly intelligent support.

## USE

- A European mobile communications retailer leveraged cognitive technology to radically improve back office processes, leading to a 70% reduction in operating costs and up to 80% improvement in operational efficiency.
- A trade finance organization digitized and categorized unstructured documentation and extracted relevant data with thousands of complex daily transactions managed by cognitive software and bots.
- [Capgemini Business Services works with Celaton](#) leveraged its inSTREAM AI software to automatically handle incoming structured and unstructured correspondence through a variety of digital channels.

## IMPACT

- Boosting work productivity and effectiveness through automated decision-making and the availability of real-time predictive insights
- Improved customer experience by adding human-like, cognitive capabilities to end-to-end processes
- Mitigating the risks of an aging workforce and dependencies on specialized or scarce knowledge
- Enable new, previously unthinkable processes to very complex, data- and event-intensive contexts

## TECH

- **Cognitive and AI solutions and platforms**
  - [Celaton intelligent services automation](#), [RAVN documents learning system](#), [WorkFusion intelligent automation](#), [Crowdfunder AI for Business](#), [Loop AI Labs cognitive computing](#), [IBM Watson Cognitive](#), [IPSoft Amelia cognitive service agent](#)



your expert

Lee Beardmore



# You

Experience



# YOU EXPERIENCE



**Arguably no IT area is so rapidly changing as that of the user experience. As spoiled, easily-bored consumers of the latest technology platforms, we expect nothing less than compelling IT experiences offered by the organizations we do business with – or work for.**

To make customers and employees truly happy through their use of your technology there should be no modesty in your next-generation IT strategy.

Creating an excellent customer experience first of all requires a Design Thinking mindset: envisioning the customer journey from an outside-in perspective, putting equal amounts of empathy and factual analytics into the equation, finding the crucial micro moments in which key decisions are made. With technology becoming ultra-interactive, understanding the nature of the real-time conversation with the customer or employee paves the road to success. Then it's no

longer a matter of creating the next killer mobile app. It is now the quest for finding – or building – the platform where supply and demand will naturally come together.

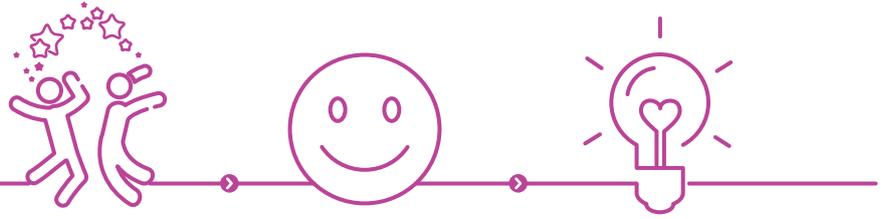
It's also simply a matter of keeping up with the rapid pace of change in user experience technologies.

Classic user interfaces on desktop and laptop computers are being replaced by chatbots and virtual agents that understand and speak natural language. These AI-driven systems can pop up on your phone, in your car, on your watch or through a speaker in your living room. Smart glasses and 3D virtual reality headsets create a fascinating mix of the virtual and real worlds.

As a little phenomenon named Pokémon Go has shown – with its rocket-speed rise and fall – there is no technology area so disruptive and unpredictable as the user experience.

Indeed, many interesting animals out there to keep a close eye on.

# I'M HAPPY



Nothing can bring down the sky-high expectations of digital era customers. Individualized, context-based, laser-focused on the task, gorgeously designed, quickly delivered across any channel. It's the quest for customer happiness that will determine business relevancy and competitive success. It begins with understanding the decisive micro-moments of the customer's day by using service design and customer journey mapping. Then, it's about creating the "now" and "wow" by obsessing over meeting the customer's needs in an immediate, helpful, and personal manner. An exceptional digital customer experience; clap along if you feel like happiness is the truth.

### WHAT

- Every time a customer takes out her smartphone, a micro-moment occurs. This occurs on average some 200 times a day. The Internet of Things with its "enchanted," wearable devices will create even more of these tiny opportunities.
- At each of these moments, a customer may "want to know," "want to go," "want to do," or "want to buy."
- Digital winners apply a range of technologies and integrations to understand the individual behaviors and desires within these micro-moments, fulfilling or even anticipating future customer needs.
- Digital happiness assumes digital beauty, and it can be "wowed" by a human connection like friendship.

### USE

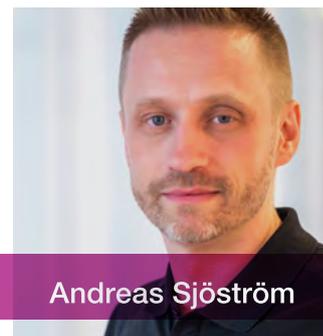
- Electronic retailer Boulanger launched a series of smart "urban stores" that feature interactive kiosks, big video walls, and employee tablets all working together with back-office systems, seamlessly exchanging information to provide a next-generation retail experience to customers in the city.
- A leading quick service restaurant chain mapped the digital journey of its younger clients and developed special web content, social media channels, and a dedicated mobile app to cater to the evolving needs of millennials and "Generation Z" individuals.

### IMPACT

- Staying relevant to digital era customers by meeting and extending their individual digital capabilities and expectations
- More effective and less costly customer service
- New market opportunities and revenue streams through the better understanding of target groups and their evolving needs
- Better cross-sell opportunities due to a higher level of customer intimacy and understanding

### TECH

- **Customer Interactions Management**
  - [Prosodie](#) customer interaction platform, [Adobe marketing cloud](#), [Salesforce Marketing Cloud](#) and [Service Cloud](#)
- **Digital Commerce**
  - [Oracle Commerce Platform](#), [SAP Hybris](#), [Salesforce Commerce Cloud](#)
- **Customer Process Management**
  - [Microsoft Dynamics](#), [Salesforce](#), [IBM Watson Customer Engagement](#), [Microsoft Cortana Intelligence Suite](#)



your expert

Andreas Sjöström



It started up, and now it may never stop. Consumers are adding messaging platforms to mobile apps and websites as their preferred medium to interact with people, brands, organizations, and services. They utilize plain text, emoticons, and other natural language interfaces—including voice—to engage in “conversational commerce” transactions. It’s all enabled by artificial intelligence, bringing actual facts and additional intelligence to the conversation. Once again, it’s a matter of understanding the conversations with your client, embracing the right messenger platforms, and speaking the new language of chat.

### WHAT

- With one billion users on WhatsApp, 900 million on Facebook Messenger, 650 million on WeChat and 215 million on Line, popular messaging or chat platforms dwarf apps and websites. Messaging is becoming the new digital connective tissue: easy to use, simple to understand, ultra-fast, and directly impactful.
- Companies can use selected messaging platforms to connect to their customers in “conversational commerce,” designed to both adopt and use typical messenger language, shortcuts, and habits to connect, discuss, and transact.
- AI and cognitive technologies make chat conversations more fluent, through adapting to the ‘mood’ of the customers and providing contextual insights.

### USE

- KLM customers can alter their ticket or change their seat via WeChat, a functionality that is also available through the website or the mobile app. However, in-app use feels more comfortable to many people because they can chat in their own words.
- A visit to a doctor can be planned in China via WeChat through a specialized, automated sequence that guides the patient through dialogue to select a hospital, the department, the doctor, and the date and time.
- Taco Bell’s [TacoBot](#) takes customer orders on a messaging platform; the bot has been programmed to display a fun

personality, answering questions and dealing with problems with wit and patience.

### IMPACT

- Creating the Wow: the ability to bond on an emotional level by using dialogues instead of digital dichotomies
- Creating the Now: conversing with customers during their crucial “micro moments,” whether at home, traveling, working, or enjoying their free time
- Staying relevant to consumers expecting high availability, ease-of-use, and speedy delivery
- Unique opportunities to better understand the needs of customers and anticipate future market developments

### TECH

- **Messenger apps**
  - [WeChat](#), Facebook [Messenger](#), [WhatsApp](#), [LINE](#), [Slack](#)
- **Voice assistants**
  - [Microsoft Cortana](#), [Apple Siri](#), [Amazon Alexa](#)
- **Voice assistant devices**
  - [Amazon Echo](#), [Google Home](#)
- **Messenger development platforms**
  - [WeChat Open Platform](#), [Microsoft Bot Framework](#), [Facebook Messenger Platform](#), [IBM Watson Conversation](#)



your expert

Menno van Doorn

# THE BOT EFFECT



“My bot understands me.” Artificial intelligence and end-to-end automation are creating a future full of digital, algorithmic agents. They are always available—on the phone, in the car, on the table, within smart glasses—to serve one’s needs courteously and efficiently. These specialized bots are aware of personal preferences and behaviors, and communicate in a way that fits the specific purpose, learning and improving over time. For this, personal data needs to be aggregated, analyzed, and cautiously managed. Here’s the move from customization and personalization towards a truly individual, always-on “You” experience: the bot effect benefits business, big time.

## WHAT

- Digital bots have already been working on a person’s behalf, starting with Sync Me, a way of sharing copies of digital assets and keeping them in sync across all media.
- They can also See Me: they know where a person is and has been, both on the Internet and in the real world.
- Now, they are able to Know Me, to understand what a person wants or needs and then proactively present it.
- Soon, bots will get authorized to Be Me, acting on a person’s behalf based on observed behavior or explicit personal rules and policies.
- AI and cognitive technologies drive this evolution together with high-productivity bot development tools.

## USE

- [Trim](#) and [Digit](#) are financial services bots that act on your behalf. They look into your expenses and suggest actions, like putting more money in your saving account, and following your approval, they take care of the transaction.
- [Epytom](#) is a styling bot on Facebook messenger and Telegraph. It advises you on what to wear based on your taste and the types of clothes you already own and wear.
- A Capgemini Loyalty Chatbot uses natural language processing to address retail-related issues including the adoption of loyalty schemes. Integrated into FB messenger, it draws from the user profile to auto-fill forms for loyalty scheme sign-ups. It also handles first-level customer service.

## IMPACT

- A well-designed bot can express a brand’s desired identity towards customers.
- Bots present an entirely new, alternative channel to reach out to customers and be available to them for knowledge and transactions 24/7, without human intervention.
- A bot that is trusted by consumers can collect crucial personal and behavioral information, leading to better product development, marketing, cross-selling, and customer service.

## TECH

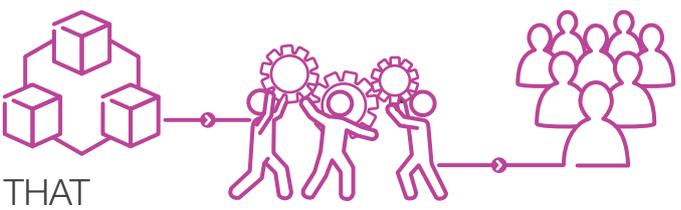
- **Bot development platforms**
  - WeChat [Open Platform](#), [Microsoft Bot Framework](#), [Facebook Messenger Platform](#), [Pandorabots platform](#), [Rebot.me Platform](#)
- **Customer conversation platforms**
  - [Capgemini Odigo](#), Imperson
- **AI and cognitive technologies**
  - [IBM Watson Cognitive](#), [Microsoft Cognitive Services](#), [Google DeepMind](#), [Facebook FBLearner Flow](#) <http://imperson.com/>



your expert

Menno van Doorn

# THERE'S A PLATFORM FOR THAT



There was an app for that. You used to seduce your customers with gorgeous, compelling mobile apps. Now, they are looking for platforms instead: they want attractive markets, directly between producers and consumers of goods and services. Because of the network effect, these platforms can drive uninhibited growth, particularly when participants join in on all sides. If platforms are the place to be, it is key to understand where you—and your customers—fit in. Should you create your own platform? How do you incite participation? Or should you partner with existing ones? This time around, it's platforms that will make, break, or entirely reverse your connection with customers.

## WHAT

- Platforms bring producers and consumers of goods and services in direct contact with one another, often while cutting out the middle-man. Typically, this interaction will involve a careful alignment of supply and demand, a comparison of features and prices, individualized suggestions, and social networking.
- They are typically enabled by a technology architecture that features data security and privacy, mobile applications, the IoT, open APIs for demand and supply sides, embedded analytics, AI, and social technology.
- Successful platform players create, stimulate, and guard positive network effects; they know what it takes to enchant demand, supply, and ecosystem partners.

## USE

- Platforms are already a fact of life for many consumers: [AirBnB](#), [HotelTonight](#), and [Booking](#) for lodging, [Uber](#) and [Lyft](#) for transport, [Instacart](#) for groceries, [Kickstarter](#) for funding, [PayPal](#) for payments, [Etsy](#) for design items, [Tinder](#) for dating, [Alibaba](#) for retail, and [eBay](#) for the quintessential personal marketplace.
- In the automotive world, the Mov'Inblue platform, built for connected vehicles and fleet management, is a very illustrative example of offering “asset-light” mobility to individuals through the on-demand allocation of cars and “virtual car keys,” combined with advanced car usage analytics.

## IMPACT

- More direct connections to customers thanks to a better understanding of their needs and preferences
- Efficiency improvements, a much more agile workforce, and the move towards a demand-driven supply chain
- New revenue opportunities as a result of newly-discovered unexplored markets and unaddressed consumers
- Entirely new business models that allow for disruptive consumer and partner interactions

## TECH

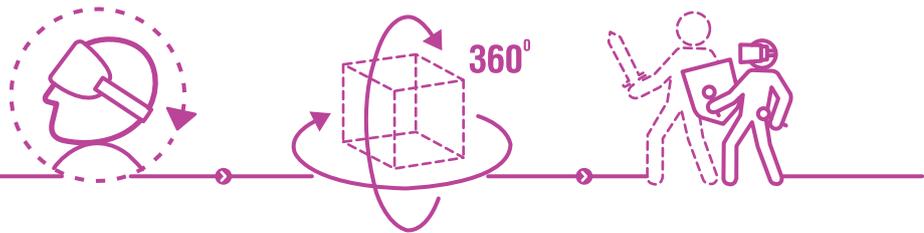
- **App Development Platforms**
  - [IBM BlueMix](#), [Microsoft Azure development](#), [Mendix rapid development](#), [Salesforce App Cloud](#)
- **API management and micro-services**
  - [Mulesoft](#), [Google Apigee](#)
- **Analytics and AI**
  - [IBM Watson](#), [SAS Viya](#), [Microsoft Cortana Intelligence Suite](#), [SAP Hana](#)



your expert

Jacques Mezhrhid

# REALITY BYTES



Is this the real life? Well, look up to the skies and see. These days, almost any pocket-sized device can create a completely 3D virtual (VR) or augmented (AR) reality, dramatically improving the way technology is delivered. It's all thanks to the gaming industry, which has delivered tons of tech innovations to the masses. It makes you want to rethink the IT user experience from the ground up, mashing up the real world perspective of the consumer or worker with unique, digital "realities." This blend of reality and fantasy has radical disruptive potential in areas such as healthcare, training, maintenance, defense, R&D, and collaboration. Buckle up: bits are about to get real.

## WHAT

- Once confined to high-end computing work in research and the military, advanced 3D, 360°, and simulated realities are now mainstream. This is thanks to high-res, head-mounted VR displays such as the Oculus Rift, but also through low-cost "cardboard" VR headsets, any of which could be combined with motion-sensing and 3D scanning technologies.
- Augmented reality (AR) technologies are also quickly evolving, adding digital layers to the world we perceive. This can be as easy as pointing a smartphone at a subject to seek out more information, or through the use of dedicated goggles, headsets, car screens, and even contact lenses and holograms of the future.

## USE

- Using a simple cardboard VR headset, potential buyers of a new car can fully configure and experience their future car from all angles.
- A cloud-hosted "smart glass" solution was paired with voice control and integrated with SAP to support field staff in even the most complex maintenance activities.
- Within the concept of [Industry 4.0](#) and in search of operational efficiencies, using technologies like virtual reality is clearly a differentiator. The AR tools of [Dassault](#), [Diota](#) and [Open cascades](#) allow end-to-end solutions for the "augmented worker" in the factory or in the field.

## IMPACT

- Being able to integrate tightly with the perceived reality of consumers and workers, creating unique and intimate user experiences
- Advanced visualization of data, making insights more contextual, clear, and actionable
- Breaking the barriers of time and location to facilitate previously unthinkable and safer ways of experiencing, designing, modeling, and collaborating

## TECH

- **Virtual Reality**
  - [Oculus Rift](#) and [Gear VR](#), [HTC VIVE](#), [Sony PlayStation VR](#), [Google Cardboard](#)
- **Augmented Reality**
  - [Layar](#) for smartphones, [Microsoft HoloLens](#), [Magic Leap](#), [Vuzix Smart Glasses](#), [Epson Smart Glasses](#)
- **Motion and Image Sensing, 3D scanning**
  - [Microsoft Kinect](#), [Google Project Tango](#), [Structure 3D scanning](#), [Bridge VR and sensor system](#)

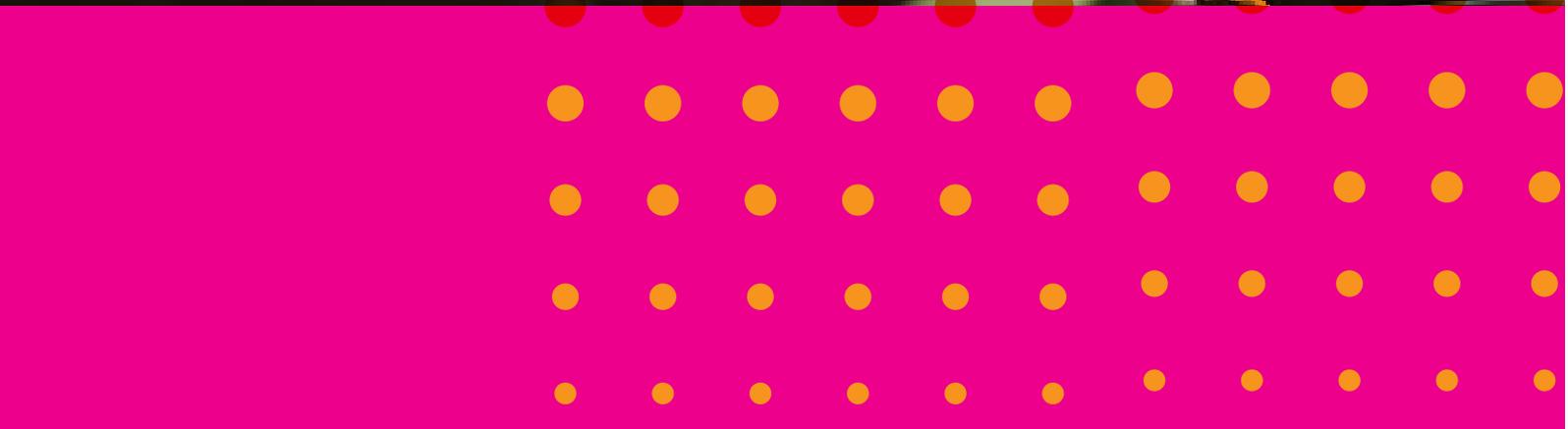


your expert

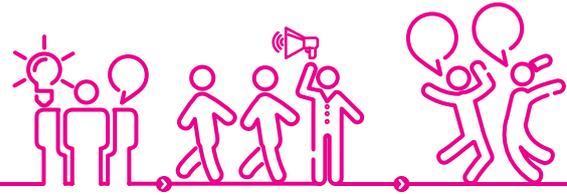
Arnd Brugman



We  
**Collaborate**



# WE COLLABORATE



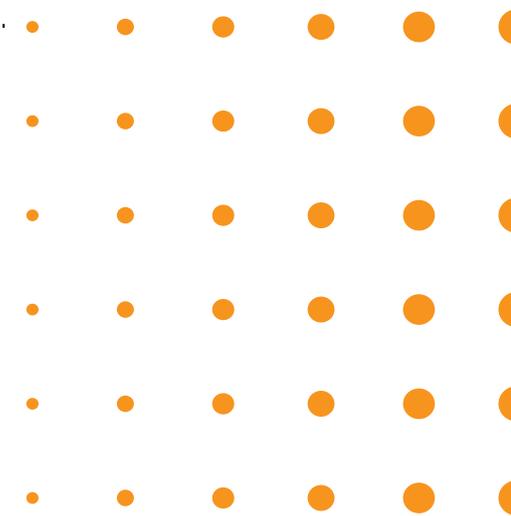
**Humans, organizations and nowadays also “things” find their meaning and value in being connected to others. With the outside world getting better and better connected – through superior, ever more ubiquitous technology and an abundance of social platforms – the enterprise needs to mirror this level of connectivity and use it as a key enabler to its strategy.**

Being able to navigate any ecosystem, with its characteristics, dynamics, key players, standards, preferences and unwritten rules, is a prerequisite for social mastery. It gives access to possibly otherwise scarce resources, unexplored markets and channels and agile, possibly asset-free business models. It also taps into a crowd IQ that goes way beyond what even the brightest enterprise could develop on its own.

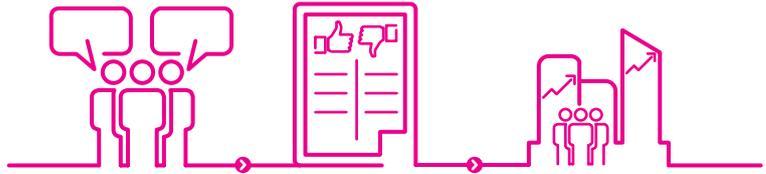
It also requires particularly flexible technology options, as connections may come and go in an instant. The IT platform needs to provide services to leverage a new breed of connections at top speed. The blockchain is an example of a technology framework that substantiates the notion of smart, collaborative contracts; these are distributed, open, transparent and rock-solid safe.

The latter capability cannot be emphasized enough; being successfully connected depends on mutual trust. And trust is based on an equally divided mix of clarity about what's to be expected at both sides and the measures that have been taken – both in terms of technology and governance – to ensure the right outcome.

You, Me, Us, We, It.  
All together now.



# HAPPY TOGETHER



Now matter how they toss the dice, your ability to navigate the social networks around you and your customers sets you up for success. Social networks point the way to understanding what makes your customer happy through connections, preferences, opinions, activities, needs, and likes. But customers now see better than ever what their social profiles are actually worth. They will want to understand in what way their personal data is monetized. Privacy and personal data security have taken a front row seat. Handle this digital “egosystem” proactively with proper care, timing, and empathy, and you’ll thrive on trustworthiness together with your customers..

## WHAT

- Mastering the social network of customers—with all its digital platforms, tools, technologies, and communities—presents crucial yet disruptive growth capital for organizations.
- Personal profile data that reflects this social network provides powerful input to activities such as innovation, product management, marketing, sales, and customer service.
- The privacy and security of this data are, however, quickly becoming a key element to master, if only to comply with [stricter rules and regulations](#) (such as GDPR in Europe).
- A trustworthy brand with the customer’s perspective radically central is the best way to establish extraordinary connections that deliver extraordinary results.

## USE

- A major consumer goods company created a focused “People Data Center” that captures and analyzes social media data across various social networks. They then made it available to all business units for use in product management, marketing, campaigns, and customer support.
- A utility company positioned itself as the “Most Social Utility in Canada,” connecting with customers and trading partners through multiple social channels and progressively using innovative technologies and media.
- The Consumer Goods Forum defined seven clear [principles for consumer engagement](#) to which organizations should commit in order to build trust and engage with connected customers.

## IMPACT

- Become—and stay—more relevant to customers through a proactive, connected dialogue.
- Anticipate trends, opportunities, and threats
- Skip activities that dilute the richness of social content and context.
- Build better, more meaningful, and more sustainable relationships with customers from a trustworthy brand.
- Enrich products and services with additional social layers and capabilities, and build new revenue streams.
- Monetize social profile data in and outside the company.

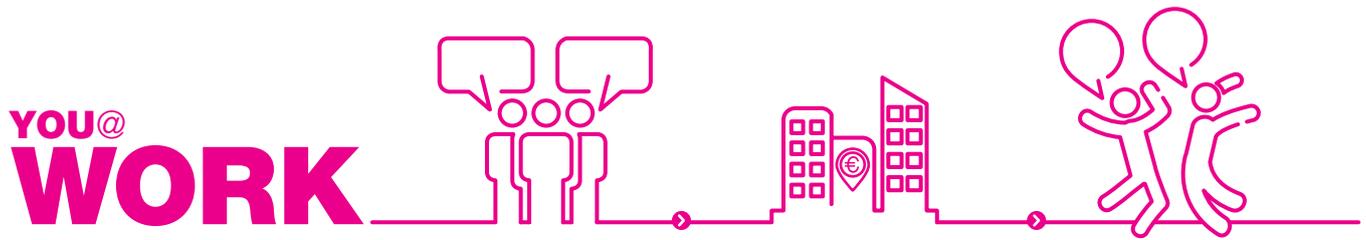
## TECH

- **Social Technology Platforms**
  - [Salesforce](#), [Brandwatch](#), [Crimson Hexagon](#), [GNIP](#), [Google Analytics](#), [Sysomos](#), [IBM social media analytics](#), [Lithium](#)
- **Revenue Management Platforms**
  - [Marketo](#), [Act-On](#), [Adobe](#), [Oracle Eloqua](#), [Salesforce Pardot](#)
- **Specialized social technologies**
  - [Evocalize](#), [Inkybee](#) blogger outreach, [BuzzSumo](#) content analytics, [Circloscope](#) community management



your expert

Kees Jacobs



Automation and AI are changing the purpose of people at work. As technology performs more and more complex tasks, the role of a worker transforms from “just” being a part of a business function to addressing challenges across the business. Peer-to-peer platforms increase transparency, dexterity, and connectivity across any role or organization. AI supports the dynamic matching of people’s skills and interests with the job to be done. Freelance at scale is the new employment model in the Gig Economy. The new focus is on the individual and her network, creating freedom and personal purpose.

### WHAT

- Domain expertise becomes less dependent on individuals as AI gradually does a more effective job.
- Highly automated (robotic systems) take over many routine human tasks.
- The next generation of social and collaboration tools will help to rapidly locate the internal and external people needed to resolve the challenge at hand.
- The skills people need will shift to information and personnel network management. It’s not about what they know, but how they think and the types of problems they can solve.
- Technology facilitates the connection of purpose and productivity, selecting work based on a desired impact.

### USE

- A global media and entertainment company changed the way that work shifts were allocated from fixed allocations to auctions and bids, based on personal preferences.
- A global fashion brand transformed the way connections were made and information shared between the employees of their stores and back-office.
- An internationally operating temporary employment agency used advanced analytics and cognitive natural language analysis to automatically and optimally match demand and supply around their pool of temporary workers; Capgemini is now using the same software for its own, internal purposes.

### IMPACT

- Enabling the speed of innovation and creativity needed today to stay in touch with the digitally-savvy consumer and employee, becoming more competitive as a result
- New levels of productivity and engagement
- Higher levels of compensation and personal job satisfaction for employees through the freedom of selection
- Reduced cost of operations because larger businesses can operate using a smaller core operating model with a wider, more flexible network of experts on which to draw

### TECH

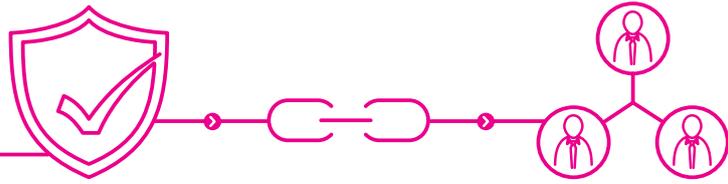
- **Freelance hubs:**
  - [UpWork](#), [Freelancer](#), [Fiverr](#), [Outsourcery](#), [Workhoppers](#), [Gigster AI-enabled IT development services](#)
- **Collaborative work platforms**
  - [Hubstaff](#), [Facebook Workplace](#), [Microsoft Yammer](#), [Slack team communication](#)
- **Dynamic resource matching**
  - [Capgemini People Analytics](#), [IBM Smarter Workforce](#), [Workday HCM](#), [SAP SuccessFactors](#)



your expert

Ben Gilchrist

# NEW CHAIN ON THE BLOCK



Excellent connections create excellent results. What if getting connected and doing transactions in an ultra-safe, transparent, and effortless way comes to you as a fully automated platform capability? Well, there's a new kid in town, and it seems she's here to stay. The Blockchain is the most striking example of a next generation platform that acts as a public ledger for open, collaborative transactions and 'smart' contracts. It provides generic connection capabilities that speed up transactions, cut out the middleman, and provide full transparency while ensuring data integrity, privacy, and security. Seems we're in the middle of a chain reaction!

## WHAT

- Blockchain was introduced as part of the underlying technology for Bitcoin; it acts as a public ledger for transactions while keeping the users anonymous. It uses distributed, peer-to-peer computing to maintain data integrity.
- Blockchain ensures that all transactions are public yet anonymous while maintaining an open audit trail. It has no single point of failure.
- It is still an emerging technology but it has high potential for use in business areas such as payments, recording transactions, and strengthening trust, which quickly places it beyond the pioneering areas of FinTech and digital commerce.
- It's a quickly emerging development platform, even in an "as-a-service" formula.

## USE

- [BigchainDB](#) enables artists to declare their authorship, define licensing, and transfer rights for free while preserving provenance of the work. Content creators can manage and track the usage of their works globally so that they can be properly compensated.
- The [TransActive Grid](#) allows residents to transfer or sell excess stored renewable energy to your neighbor automatically. It's only one example of many [Ethereum](#) use cases.
- A European bank is working with a large city harbor to register all incoming shiploads in a distributed, 'smart' ledger using Blockchain.

## IMPACT

- Improved value chain efficiency by cutting out the middleman for trust and building on an open, secure platform for collaborative transactions
- Increased data security, privacy, and auditability, all crucial with data protection regulations such as GDPR becoming tighter every day in the digital world
- Disrupting the way businesses exchange value and assets, enforce contracts, and share data across industries, potentially opening up entirely new business models

## TECH

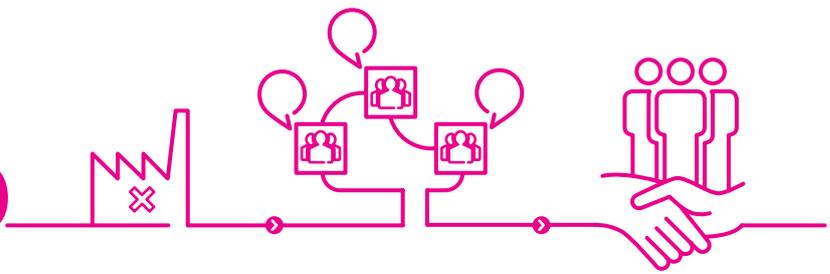
- **Collaboration innovation consortia**
  - [HyperLedger](#), [Ethereum Foundation](#), [R3](#)
- **Blockchain platforms**
  - [BlockChain](#), [Chain Core](#), [Abra](#), [IBM Blockchain on BlueMix](#), [BigchainDB](#), [Microsoft Azure Blockchain as-a-service](#)
- **Blockchain app development platforms**
  - [Ethereum](#), [Emercoin digital currency and blockchain service platform](#)



your expert

Kim Smith

# CROWD SURFING ALLOWED



Imagine the crowd out there, full of innovative ideas, brilliant opinions, alternative perspectives, and scarce expertise, just waiting to collaborate with you. Wouldn't you love to jump right into it? However, the best talent in today's market quite likely doesn't work for you. So how can you tap into the world's brain trust to accelerate your digital agenda while electrifying your existing workforce? How do you reach beyond your own organizational boundaries to expand to the global IP economy? Enter crowdstorming: combining brainstorming and the power of the crowd on a large social scale. Enter crowdstorming, the explosive blend of brainstorming and crowdsourcing on a large social scale. It's one powerful digital mosh pit you'll want to dive into.

### WHAT

- "Crowdstorming" is the process of enabling business through an ecosystem of potentially thousands of people to ideate, innovate, test, learn, execute, support, and sustain your business. It is driven by social technologies.
- It incorporates outside perspectives, opinions, IP, ideas, thoughts, and experiences into the evolution and even the revolution of products and services. The objective focuses on the maximum level of collaboration in order to optimize all results and desired outcomes.
- Crowdstorming can target potential future customers and business partners, but also specialized communities of expertise, such as data scientists and R&D.

### USE

- Lego has created a community around its [Cuuso building blocks](#), using social filtering and voting to select the best new product ideas.
- [Quirky](#) is a community-led invention platform that lets people submit their ideas to a global community of inventors, makers, designers, and tinkerers to help to refine these ideas in exchange for influence.
- [Local Motors](#) leverages crowdstorming to solve the world's most challenging problems in engineering.
- Established global companies launch their gamified Big Data challenges on [Kaggle](#), reaching out to thousands of data scientists in search of the "killer algorithm."

### IMPACT

- Achieving a more intimate engagement with future consumers and suppliers while keeping up with digital expectations
- Redesigning how an organization makes investments, places bets, innovates, and steers clear of business disasters through pre-emptive social testing
- Gaining access to scarce resources, capabilities, experiences, and intellectual property
- Revitalizing the workforce by connecting with fresh perspectives and ideas from the outside world

### TECH

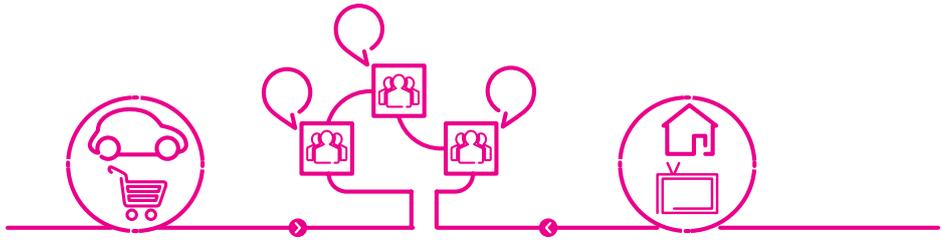
- **Crowdsourced resources**
  - Jumpstartfund [for ideas, from conception to funding](#)
  - Kickstarter [for start-up curation and funding](#)
  - Kaggle [for data science](#)
  - Amazon [Mechanical Turk](#) for micro work
- **Crowdstorming Platforms**
  - [Jovoto](#), [Local Motors](#) Motors engineering crowdstorming platform, [Communifire crowdsourcing software](#), [InnoCentive](#) open innovation, [Hypermiind](#) prediction market, [IdeaConnection](#), [Ideaken](#)



your expert

Kim Smith

# FRIEND THAT THING



Operational technology and IT are fusing into a new cyber-physical reality as the Internet of Things becomes part of everybody's social context. With IT getting physical, we're more and more connected not only to people, but also to omnipresent devices and increasingly intelligent things. Disruptive opportunities lie in these connected products, with the promise of a direct route into the hearts and minds of consumers, service engineers, and business partners. It brings a whole new dimension to social networks, for future lists of social "friends" may soon contain some unexpected guests. Chip me baby, one more time.

## WHAT

- 'Things' are more intelligent and better connected than ever before. Mixed with AI, they learn, adapt to their environment, and share their experiences. Cars, road sensors, engines, fridges, health equipment, and even vending machines are becoming serious participants in both social and value networks.
- With wearables and the IoT elements around us on a daily basis, some of them may "know" more about consumers and their context than the consumers do themselves.
- IoT development platforms allow for the creation of "digital twins," leveraging the vast intake of data for predictive analytics and cognitive augmentation. It then sends the results to both the affected humans and things.

## USE

- A global digital manufacturing leader invests \$1B to monetize its new IoT and analytics platform, shifting from being a product manufacturer to an IoT development and deployment platform provider.
- Toyota Friend enables people to interact with their cars, dealerships, and Toyota itself. In addition to prompting recharges whenever the battery is running low, it enables the car to "tweet" service information to social channels.
- Michelin uses IoT technology to collect various sensor data from tires in use. Engineers in its "road usage laboratory" analyze the data in direct connection to selected driver groups with different levels of experience.

## IMPACT

- Better understanding of the actual use of products by consumers in their context, improved product management, innovation, marketing, and customer service
- Using the IoT as an alternative, direct channel to communicate and engage with customers
- Improved matching of human resources and assets in an operational context, like when using predictive analytics for maintenance, logistics, and manufacturing
- Monetization of IoT data through new services and products

## TECH

- **Industrial internet, IoT, digital manufacturing**
  - GE [Predix Industrial IoT platform](#), [Amazon Web Services IoT](#), [C3 IoT platform](#), [Google IoT Cloud platform](#), [Microsoft Windows 10 IoT](#), [Salesforce IoT Cloud](#), [IBM Watson IoT](#), [ThingSpeak open IoT platform](#), [Thingworx dev platform](#)
- **Open source and open standards**
  - [Project Flogo open source IoT integration](#), [Open Connectivity Foundation](#), [Open Group IoT work group](#), [Eclipse IoT standards](#)



your expert

Jim Carroll

# Applying TechnoVision

**There are many ways to apply TechnoVision, like brainstorming entirely new ideas, systematically crosschecking a design on how up to date it is, and finding a breakthrough to tackle a tough challenge.**

But above all, TechnoVision is a tool to tell a digital story, a story that shapes an opportunity, answers a question, gives direction, resolves an issue, or simply delights an audience. It is always a story to be told between people, from both the business and IT sides of an organization. Choosing the right building blocks—studying them, interpreting them, discussing them with others—is already part of the storytelling. Then, the blocks are woven together with other views, considerations, and scenarios to create a unique digital story that addresses a specific need, challenge, or opportunity.

Selecting a business technology frame from our white paper or getting a rough cut of relevant technologies through a trend radar or S-curve “hype cycle” are other complementary approaches that may also prove useful. In short, anything that triggers the need for a compelling digital story will do...as long as it's a simple story.

In ten years of TechnoVision, we have spent a considerable amount of time getting rid of complexity in the approach. We surpassed our “business-driver-to-technology-trend” matrix years ago. We introduced icons, visual metaphors, storytelling, and (hopefully) intriguing trend names. We also cut down on the content volume, forcing ourselves to focus on the essentials within a minimal, structured format.

But boxes delivered the most impact hands down: 37 trends turned into colorful, real-life cardboard boxes (thanks [Sinead Sheils](#) and her team at the Capgemini University for the original design). Each box contains a short elevator pitch of a trend and contains a QR code with a link to the more detailed content.

These boxes can be picked up, carried away for study outside in the sun, discussed with others, and stacked as digital “totem poles.” Together, they can tell a technology-enabled customer story, a day in the life of an employee, a breakthrough in a process, or a new, disruptive product.

Our digital “building boxes” turned out to be an easy, attractive language spoken by both IT and business people. We have put them in our [Applied Innovation Exchange](#) labs, our agile development zones, and our office lobbies. Rumor has it that a certain TechnoVision author even glued a full mini-set to his wall at home...talk about dedication! We have also made the graphic designs openly available, so that the boxes can be printed out on plain cardboard (or processed in any other way; we welcome creative best practices and will be happy to share them with the outside world).

The boxes feature in several of the examples we gathered about applying TechnoVision. The full list is as follows:

- TechnoVision Theater (with boxes)
- Business Model Canvassing (with boxes)
- Repositioning
- Digital Picture
- Storytelling
- Grab a Box (with boxes)

Again, we welcome hearing about other best practices and are most happy to share any additional format you have pioneered yourself around applying TechnoVision.

# TechnoVision Theater

## What to Achieve

Create digital stories that address business challenges, opportunities, potential innovations, digital strategies, or architecture with TechnoVision Theater. Used as an introduction to general technology trends or as a teambuilding and alignment tool for business and technology delegates, it helps familiarize a team with Technovisions capabilities. You can even apply it as a hands-on “ice breaker” during transformation workshops.

## For Whom?

TechnoVision Theater lends itself well to business and technology representatives with no specific requirements in terms of knowledge, expertise, or experience. This session can be completed with one team of three to five people, but is more effective with multiple teams reporting out to each other and building on each other’s stories. Sessions of up to 50 attendees (spanning seven teams) have been successfully conducted.

## Preparation

Preferably, participants have already some basic knowledge of TechnoVision, although it has proven to be difficult to gather a team consisting of equally informed members.

Before starting the session, make sure you have built up the TechnoVision “wall” with boxes, positioning the cluster areas and boxes in the right sequence. The cluster “header” should be on top of its pile and the five trends—if possible—sorted according to their sequence in the TechnoVision document. This facilitates the process, as the wall can be used to explain the TechnoVision framework.



Documenting the sessions is a must. This can be done through video recording or supported by a “live cartoonist.”

The session also needs a credible problem-owner that a) can express the challenge crisply and convincingly, b) the teams report out to, c) supplies feedback to the team and provide an overall summary at the end.

## Beginning of the workshop

The workshop opens with a short (five to ten minutes) introduction of the TechnoVision framework with its structure of six technology clusters (the “what”) and the design principles (the “how”). Do this on a high level and provide some examples to which the participants can relate. Rely on the attendees to study the content of the blocks themselves after selecting them and provide just enough information to help them make the right choices for the building blocks. Then, describe the process of forming teams, building a digital story, and reporting out.

The problem-owner describes the challenge at hand; it can be a strategic question, a conundrum, a quest for ideas, a process redesign, service, or product.



## APPLYING TECHNOVISION

### Working

Form the teams. Team size will depend on the time available (more report-outs take more time) and the number of people attending.

The teams select a few building blocks that they deem particularly interesting for the challenge at hand. A digital story should typically consist of a minimum of three building blocks and a maximum of seven (five seems a good average). The “header” building blocks should not be selected (although quite a few teams have been known to break the rule with positive results).

The blocks are selected on a first-come, first-served basis. However, if while building a digital story a team decides a block is not as useful as anticipated, another box may be selected. Of course, the rejected block needs to be put back into the pile for potential use by other teams.

Next, the teams start to study the building blocks, reading the elevator pitches on top of the boxes and maybe scanning the unique QR codes with their smart phones for more information. The team members can explain the boxes to each other, provided each box is individually examined.

By building on each other’s ideas, the digital story gradually comes together through the combination of building blocks from several colored clusters. It is worth mentioning that focusing on one cluster per team has been a successful, early format as well. Teams can choose to combine technology building blocks from the six clusters along with the “mindset” building blocks of the Design for Digital cluster; a good story often involves both the “what” and the “how.”

Take 15 to 30 minutes to build a digital story, depending on how much time is available.

### Reporting out

Each team reports out to the problem owner in its own way. The blocks are typically stacked while telling the story to illustrate the enabling role of each building block within the storyline. Some teams prefer to simply create a pile, but we have also seen more creative constructions like “totem poles” or arcs. The report-out should not take longer than five minutes per team, to keep the story crisp and to the point. A cartoonist may capture the story or each story can be recorded. Teams should photograph the final box construction for later use. The other teams provide initial feedback to the story, followed by the problem owner. A feedback round should be time-boxed to five to ten minutes each, depending on the time available.

The problem owner gives a final summary and assessment after the last report-out, possibly selecting stories or story elements and suggesting potential future steps.



# Business Model Canvassing

## What to Achieve

Create insight into how technology can change the business models of organizations with two novel approaches: the Business Model Canvas method and the TechnoVision building boxes. At the end of a session, participants will garner a working knowledge of these approaches and create a list of potential business model improvements or changes. We suggest taking a picture of each idea and having a separate meeting (after about two weeks) to validate the feasibility of the idea within the organization and to identify some potential next steps.

## For Whom

Participants are business and technology representatives, with no specific requirements in terms of knowledge, expertise, or experience.



## Preparation

Preferably, participants have already familiarized themselves with both TechnoVision as well as the Business Model Canvas approach, as many instruction videos are available on YouTube, including a, b, and c. Before starting the session, make sure you have built up the TechnoVision “wall” with boxes, positioning the cluster areas and boxes in the right sequence. This facilitates the launch process as the wall can be used to explain the TechnoVision framework. Then, draw a large BMC model on the ground using painter tape.

## Beginning of the workshop

The workshop starts with a short introduction on both models. For TechnoVision, introduce the framework (the seven building blocks), the structure of the five elements within the building blocks, and the seven design principles. Do this on a high level and provide some examples. No need to dive into the details yet. For Business Model Canvas, explain the origin (how



Ostenwalder used the model to write his book) and the different elements of the Business Model Canvas.

## Working

After the explanation, take one example of a company that:

- Most people will be familiar with
- Is bankrupt or highly successful

Then, take some boxes and explain which elements the successful company put in place so they stand out from their competition or move boxes into the BMC model to illustrate what the bankrupt company could have done differently.

Next, ask the participants to consider their own organization or a specific part of their business (organizational unit or product). Let them generate ideas about how the technology building blocks can be used to improve business performance or even entirely change the organization. Let them physically place the boxes in the model on the ground. Encourage discussion, play for about ten minutes, and ask for a report-out.

If you have a large group, you can split them up into groups of four or five and have them report out to each other. Depending on the time, you can have multiple rounds. You will see that the stories improve with each round.

Make a picture of each model and write a one-sentence description. If possible, print it out. At the end of the workshop, these prints can put on a two by two matrix, labeling the axes as “impact of the idea” and “ease of realization.” The big impact ideas that are easy to realize are the ones the participants should take with them to elaborate on later.

Let the participants give a short statement on the insights they gained. Then, let them all take one box that they found particularly interesting and take a group picture with the boxes.

# Repositioning

## What to Achieve

Examine existing development projects, and operational applications, to boost their digital orientation and role, by first checking if and how they make use of digital technologies, and second: tuning, amending, enhancing, or repositioning these applications to take better advantage of new technologies.

As a result, existing and past investments are not wasted on the path to the digital enterprise. They are updated, pruned and rejuvenated for faster progress.

For example, an on-going Customer Relationship Management project will be re-oriented towards a series of smartphone applications with a different distribution of roles between customers and employees.

## Who

Project teams, together with two kinds of challengers: one or two with knowledge of the application field, and one or two with knowledge of the new technologies.

## When

- Timing of initial positioning:
  - For developments: soon enough to make changes with minimum effort
  - For operational applications: after 6 or 12 months of run, depending on estimated rate of change of functionality and technology
- Repeat after 6 months for developments, 12 months for operational applications

## Preparation

1. A good, sufficiently detailed description of the application—functionally and technically, including the various APIs used and provided
2. A state-of-the-art view of the application area
3. A checklist of technologies based on TechnoVision 2017

## The Format

Depending on complexity, repositioning takes between two hours and two days.

The repositioning steps are as follows:

1. Walk-through the application in development or as is
2. Comparison of the application with state-of-the-art thinking
3. List potential adjustments with a rough estimate of corresponding efforts; list potential simplifications or eliminations with rough estimate of corresponding savings
4. Go through the TechnoVision-based checklist and create three categories:
  - Used already
  - Not used and relevant
  - Not used and irrelevant
5. Combine functional changes and “not used and relevant” technologies to create a list of potential repositioning actions.
6. Decide on actions based on impact and effort required.
7. Plan actions in relation with the original schedule.



# The Digital Picture

## What to Achieve

The Digital Picture is a Capgemini methodology used to produce an accurate image of an enterprise's digital position. It is produced by combining the points of view—expectations compared with reality and experience—of various stakeholders, from top management to customers of the enterprise.

The Digital Picture can be usefully completed and detailed with a TechnoVision-based image of the enterprise's position in digital technologies.

## Who

All people with a thorough knowledge of the technical position of the IT department and of other holders of information technology in the enterprise, as well as one or two connoisseurs of TechnoVision 2017.

## Preparation

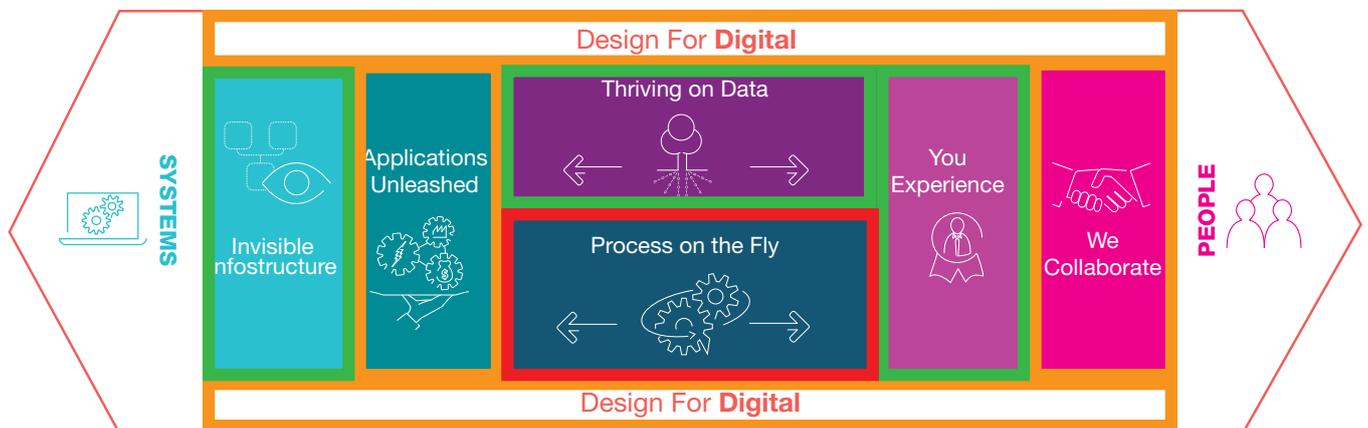
None, except having available the pictures or forms needed to capture status.

## The Format

The work takes the form of a dialogue between:

- the connoisseurs of TV, who give a description of a cluster's content, starting with the Design for Digital principles, and continuing from left to right with the content clusters
- after the description of each cluster, people knowing the technical position of the enterprise describe it for this cluster's principles or technologies
- collectively, the positioning is completed with the color coded attributes:
  - green: adequate knowledge and capabilities, solid actual and planned uses
  - orange: significant gaps between technology's potential and actual mastery and use
  - red: technology's potential ignored and therefore not used or envisaged.

Here is an example below: This can of course be done at a lower granularity level, by principle and trend individually.



# Storytelling

## What to Achieve

Use TechnoVision 2017 to tell a digital story. Of course TechnoVision is just one of the ingredients of your story, but it adds structure and content. For example, to discuss the accelerations the digital world requires and enables, you can start with the cluster You Experience, to understand the speed expectations of digital people; move to You Collaborate if you want to explain the speed components of social networks; Process on the Fly will help show how external speed gets translated internally, making use of real time data availability—mastering the velocity of big data flows, with the help of Thriving on Data.

You can find inspiration in the design for digital principle What's Your Story, which prescribes that each application should tell an attractive story.

## Who

Anybody with the will to tell a digital story. A working knowledge of TechnoVision is needed, and can be acquired by practicing the development of stories.

## Preparation

A thorough scripting is needed to give the story structure and avoiding getting bogged down into anecdotal details.

## The Format

Monologue is feasible, but all forms of dialog and conversation help with the actual understanding through participation.

Using the TechnoVision boxes is a proven way to make the content more alluring and tangible.



# Grab a Box

## What to Achieve

Get an ultra-fast benefit from TechnoVision in just a few minutes. Create a long-lasting memory (if nothing else) through a picture. Acquire your first taste of working with TechnoVision. Have a quick icebreaker between workshop sessions.

## For Whom

For anyone, including people that happen to be visiting an innovation center or office space that feature the boxes.

## Preparation

Make sure you have the “wall” of TechnoVision building boxes set up.

## The Format

Don't explain TechnoVision. Just ask all participants to have a brief look at the “wall” of TechnoVision building blocks and choose a box that—on its title alone—intuitively matches their interests or ambitions. Ask every participant to give an elevator pitch on why they selected this particular box and, if applicable, what personal next step they assign to it. Take a picture of every individual showing “their” box. Finally, take a group picture. Distribute to all participants for later reference.



# What's in store?

TechnoVision 2017 is a living, breathing catalog of business technology drivers. Over the course of weeks and months, we elaborate on each and every one of the 37 items through additional links, detailed posts, and white papers by the original contributors and other [expert connect](#) stars. Visit <http://www.capgemini.com/technoVision> regularly for the very latest or pick up your favorite TechnoVision building box—if you happen to run into one—and scan the QR code to get right into the additional richness.

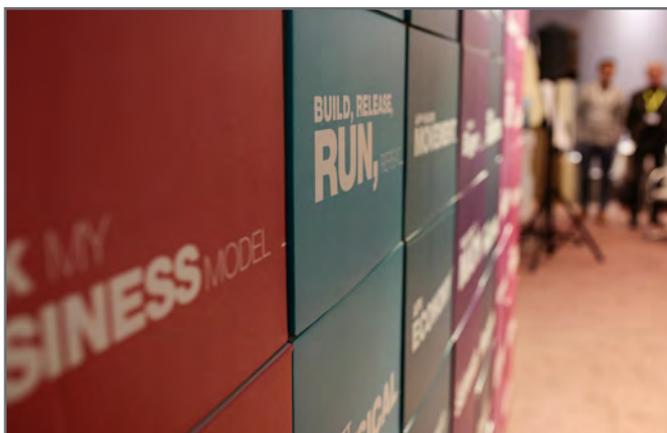
Technology evolves quicker than ever and remains stubbornly disruptive in the ways it affects people, the society, and business. TechnoVision has proven to be a both sustainable and flexible framework to navigate the volatility, drive business technology dialogs, and incite action.

And it may contain some pointers to what's next as well. After all, its cluster names have always alluded to ideal, desired end states. What does it take to create an infrastructure that is seemingly no longer there, simply being the foundation to whatever digital ambition an enterprise has, without forcing itself on a management agenda? How to unleash the full potential of next generation, cloud-based applications without having to bother about keeping the lights on of existing applications? Is there a relevant future for human intellect in

the quest for superior corporate IQ? Will processes literally become an asset that we can improve in a split-second, with the touch of a fingertip? What unpredictable, next-generation technologies will shape user experiences that we could never imagine, even in our wildest dreams? And what does it really mean if literally everything—people, things, concepts—are connected in real time?

A decade of TechnoVision marks a milestone and is made more poignant as it coincides with Capgemini's 50th anniversary. We invite you to celebrate the occasion with us while casually trying to catch a few glimpses of what's next. After all, there's always something more exciting and challenging, right beyond the horizon.

Let's keep on building new stories. The journey is never over.



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## About Capgemini

With more than 190,000 people, Capgemini is present in over 40 countries and celebrates its 50th Anniversary year in 2017. A global leader in consulting, technology and outsourcing services, the Group reported 2016 global revenues of EUR 12.5 billion. Together with its clients, Capgemini creates and delivers business, technology and digital solutions that fit their needs, enabling them to achieve innovation and competitiveness. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

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